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**Article**

# The relationship between organizational characteristics variables and management accounting system attributes in manufacturing firms

# The Relationship between organizational Characteristics Variables and Management Accounting System Attributes in Manufacturing Firms

**Geofrey Pius Kingazi[1], Henry Chalu[2] and Ernest Kitindi[3]**

## ABSTRACT

*This paper examines the relationship between organizational characteristics variable and Management Accounting System attributes in manufacturing firms. It basically focuses on how Management Accounting System (MAS) attributes help manufacturing firms in attaining their objectives by enhancing the scopes of decision making. The sample for this study was taken from five regions in Tanzania; Tanga, Arusha, Kilimanjaro, Morogoro and Dar es Salaam. These regions were selected because, compared to other regions in the country, they are thought to have a good network of manufacturing distribution. Besides, different MAS attributes of scope and integration information have been clarified to understand their impact on businesses by focusing on various organizational characteristics variables of organizational structure decentralization, corporate strategy and staff qualification. The study used Contingency Theory to explore how organizational characteristics variable relates to management accounting system attributes in manufacturing firms. The findings show that corporate strategy has a positive relationship with MAS attributes of scope and integration information in manufacturing firms. It was also found that staff qualification positively influences the MAS attributes of scope and integration information. The results further show that, there is a significant positive relationship between organizational decentralization and MAS attribute of scope in manufacturing firms. However, the relationship between organizational structure (decentralization) and Management Accounting Systems attribute of integration information is not significant.*

***Key Words:*** *Management Accounting Systems attributes, Contingency Theory, organizational characteristics, Structural Equation Model*

## INTRODUCTION

In the global context, the situation of manufacturing firms and its attributes are changing so rapidly that it is becoming more dependent on the Management Accounting System (MAS) for supporting managers in their decision making process (Ajibolade, 2013b). Organizational objectives are not similar and the need for MAS is becoming very essential in the same way (Ismail, Isa & Mia, 2018a). Manufacturing industries need to use resources in an effective and well-manageable way and it is important to know the exact needs of the industry and individual project (Waweru & Uliana, 2008). Managers of manufacturing firms are facing huge amounts of complexities on a daily basis regarding hierarchical operational distribution and controlling those with expert hands to achieve the utmost business goals and objectives (Plotkin *et al.*, 2017). According to Wangwe *et al. (*2014), the economic growth of the nation is somehow connected with the manufacturing industries, which provide market for raw material from agriculture sector. The approach of African regions in achieving economic growth is different from other global regions like Asia and

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America. Hence, the socio-economic environment of this region is found concerned about its future development.

The MAS attribute information can be helpful in bringing about efficiency and effectiveness in its business process (Ismail *et al.,* 2018a). Tanzania is one of the countries in the East African region that has a wider agriculture process. The Tanzania's economic growth depends on the development of manufacturing firms that can provide synergy effects on the agriculture sector which is the backbone of the economy (United Republic of Tanzania [URT] (1999). The manufacturing sector in Tanzania remains relatively small, with most activities concentrating on the creation of simple consumer products such as food, beverages, tobacco, textiles, furniture and wood allied products (Wangwe *et al*., 2014). As Matulanya and Choi (2017) argue, the government of South Africa considers Tanzania's manufacturing firms as the backbone of earning high annual revenue and increasing the growth for Gross Domestics product (GDP). Managers of manufacturing firms, while facing challenges to have effective organizational control in the industry, need to focus on various characteristics in the same way so that managers can understand how to use available resources in a better process and how fruitful it would be for the future business growth.

Yung, Abdullah and Yau (2016) argue that, MAS information can guide managers in their decision-making on effective utilization of available resources for production. MAS attributes information can be classified as scope, timeline, aggregation and integration information (Novas, Alves & Sousa, 2017). As Soobaroyen and Poorundersing (2008) point out, it is important for MAS attributes information to be externally focused and future oriented in order to enhance decision making process. The design of the MAS attributes, to some extent, depends on the influence of the internal and external contingent variables (Shabbir & Wisdom, 2020). Shabbir *et al. (*2020) opined that in manufacturing firms, there are two major types of environments; internal and external, just like other firms that help in defining the effectiveness of business processes. The internal factors, which comprise the organizational characteristics variables, influence MAS attributes. This is because MAS operates as a subsystem of the Management Control Systems (MCS) (Chenhall, 2003; Kesumawati, Putri & Dwirandra, 2019).The influence of contingent variables on the design of MAS attribute of information in manufacturing firms includes factors such as organisational structure, corporate strategy, technology adopted in production and staff qualification (Soobaroyen *et al*., 2008; Waweru *et al.*, 2008).The organizational structure influences the forms of control within the organization as people work their way up through the hierarchy that defines the patterns of authority and responsibility (Ajibolade, 2013a). The perceived usefulness of the MAS in manufacturing firms depends on the quality of information needed at different managerial levels. Chenhall (2003) is of the view that a flow of information in manufacturing firm departments is influenced by the organizational structure. To a large extent, organizations tend to decentralize the decision making process in order to improve performance. As such, subordinates will have information about the production process that contrasts with small organizations, which tend to centralize the decision making process (Celik, Shin & Strauss, 2018). MAS attributes should link with the organizational structure.

Lack of qualified staff is one of the factors which impair the function of MAS attributes in manufacturing firms (Haldma & Laats, 2002; Aliboli, Hamid & Moosavi, 2014). The MAS attributes need a staff member who understands the business environment and the one who possesses knowledge about the business. Hutahayan (2020) points out that staff qualification is one of the most important contingent variables when designing MAS attributes in manufacturing

firms. Aliboli *et al. (*2014) argued that, MAS provides information for decision-making which is used by management for day-to-day operations. Also, information improves the coordination between different departments functioning across the manufacturing firms (Novas *et al*., 2017). Therefore, staff qualification is one of the most important variables when designing MAS attributes in manufacturing firms.

The corporate strategy of an organization specifies the direction that the organization intends to take over a long-term so as to meet its mission and achieve its objectives. To achieve better resource allocation, manufacturing firms need correct information in order to choose the best option (Ghasemi *et al.*, 2015). The manufacturing firms face local and global competition in the market. In order to penetrate in such competitions, they need to have appropriate strategy (Ghasemi *et al* 2015; Kesumawati *et al.*, 2019). According to Kesumawati *et al. (*2019), the company's strategies assist management to manage resources well thus creating value for both customers and shareholders. Also, Muslichah (2004) argued that MAS provides information which can assist manufacturing firms to conquer competition in the market. Porter (1985), in discussing the corporate strategy, noted that manufacturing firms can gain a competitive advantage if they are positioned well in the market.

According to Ghasemi *et al. (*2015), the manufacturing firm can adopt either cost leadership or product differentiation to gain competitive advantages in the market. This idea is further extended by Porter (1985) who argues that a company can implement cost leadership strategy when focusing on achieving lower cost relative to the competitors through productivity and efficiency improvement, while product differentiating companies intend to produce unique products. Abernathy and Cameron (1994) examined the parameters that influence the design of Management Accounting Information System (MIS). They argued that there is a relationship between the type of strategy employed and MAS attributes information in manufacturing firms. Therefore, there is a need to consider the relationship between MAS attributes and types of corporate strategy that manufacturing companies apply in order to conquer the competitors in the market.

Much has been written on the factors that influence the design of MAS, rather than how these factors are related to the usefulness of the information generated by MAS (see, for example, Chenhall *et al.,* 1986; Gerdin, 2005; Ajibolade, 2013a). The general review shows that there are mixed results about the perception of MAS attributes' usefulness in manufacturing firms (Chenhall &Morris, 1986; Muslichah, 2004; Soobaroyen & Poorundersing, 2008). Also there is little evidence about the importance of corporate strategy and staff qualification in previous studies by Muslichah (2004); Gerdin (2005), and Soobaroyen *et al. (*2008) that were thought to be important in the examination of MAS attributes in manufacturing firms (Haldma & Laats, 2002; Chenhall, 2003; and Aliboli *et al.,* 2014).The major aim of this study is to examine how Management Accounting System and its various attributes are helping the manufacturing company to enhance the quality and efficiency of productivity in achieving the Tanzania's economic development.

## LITERATURE REVIEW AND HYPTHESIS DEVELOPMENT

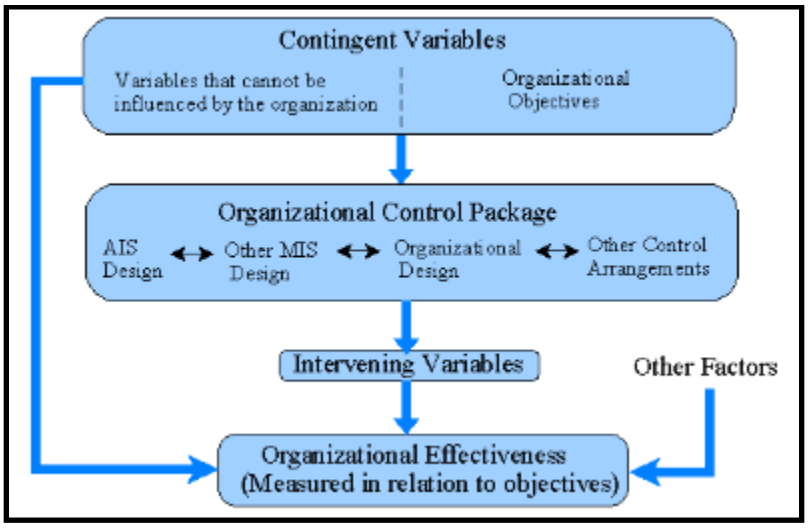
*The Contingency Theory*

Contingency Theory (CT) remains the dominant approach to studying organizational design (see, for example, Lawrence, 1993; Scott, 2003; Chenhall, 2003; and Gerdin, 2005). According to Emmanuel *et al. (*1990), CT is based on the fundamental assumption that no universally accounting system that is equally applicable to all organizations. The basic proposition of CT is that organizational viability is contingent upon a fit between organization and environment (Chanhell,

2003; Gerdin, 2005). As Granlund and Lukka (2017) argue, Contingency Theory is mainly focused on leadership approaches to make the managerial role efficient. They further argue that, integration of effective managerial behaviour and different relevant principles is counted as the key driver of managers. Leaders can help manufacturing firms in achieving high quality performance that can manage the cost expenses in core productivity and saving time in a similar way (Celik, Shin & Strauss, 2018). Managers and leaders must behave well so that employees can get engaged in their work for a longer time while focusing on their productivity level. Hence, the effectiveness of MAS can result in better decision making for business objectives.

The most frequently examined contingent variables are: external environment (Haldma & Laats, 2002; Chenhall 2003; Abdel-Kader & Luther, 2008; Ajibolade 2013a), organizational structure (decentralization) (Chenhall & Morris, 1986; Haldma & Laats, 2002; Chanhell 2003; Soobaroyen & Poorundersing, 2008), technology adopted in the production process (Chenhall & Morris, 1986; Haldma & Laats, 2002; Chanhell 2003; Soobaroyen & Poorundersing, 2008) and interdependence (Chenhall & Morris, 1986; Haldma & Laats, 2002; Chanhell 2003; Soobaroyen & Poorundersing, 2008). Chenhall, (2003) argues that effective MAS design needs to consider other factors such as organizational strategy and culture and the types of tasks involved. However, Fisher (1995) agree that contingent variables (which may include but are not limited to the external environment, technology, organizational structure and firm's strategy) influence the design of MAS. Thus, in order to succeed, the organization must maintain a consistent relationship with the environment. Otley (1980); Haldma and Laats (2002) noted that the effectiveness of MAS design depends on its ability to accommodate changes in both external circumstances and internal factors. Therefore, organizational characteristics variables influence the MAS attributes in manufacturing firms because the organization needs to accommodate changes in the business environment (Haldma & Laats, 2002).

**Figure 1: Contingency theory**

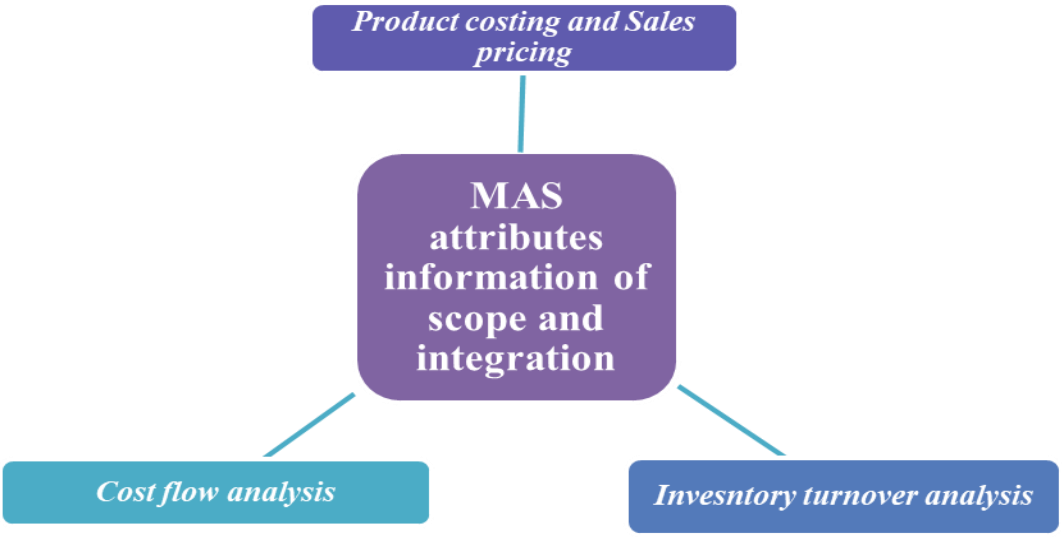



Source: Granlund and Lukka (2017)

*Management Accounting System (MAS) attributes*

The MAS attribute information must be characterized based on the business demand and the need to bring success in manufacturing firms (Muslichah, 2004; Soobaroyen & Poorundersing, 2008). The information collected by MAS attributes is well designed associated with the broad term system of the manufacturing company to understand the business environment for the decision making process (Abdel-Kader & Luther, 2008). The MAS attributes emphasize that the firms must maintain accuracy while focusing on timeliness and consistency in the workflow for meeting the demand of every user flexibly (Soderstrom, Soderstrom & Stewart, 2017). The MAS attribute information provides details for production decision such as product costing and valuation to evaluate the overall cost of production in a firm based on the quantity of goods and services (Ismail *et al.*, 2018a). In a manufacturing firm, different kinds of products can be found to produce that need to examine various cost-related variables such as direct cost, indirect cost and fixed expenses (Yung *et al.*, 2016). Therefore, MAS attribute information supports the management for resource allocation in production of goods. Cash flow analysis is vital information generated by MAS attributes that determines the impact of cash on business decisions (Pavlatos & Kostakis, 2018). Ismail *et al. (*2018b) argue that, financial transactions are being done in a huge amount in manufacturing firms, as operations are huge in a similar way that needs proper capital management. In that case, for helping the economic growth of the nations, cash flow analysis must be assessed in an effective manner. In the same context, inventory turnover analysis is counted as another vital attribute in manufacturing firms while the financial crisis has created several issues for the growth of overall business processes (Pavlatos & Kostakis, 2018). According to Pavlatos and Kostakis (2018), in a single time, the MAS attribute information supports decision making on the inventory movement, for example, how much inventory has been sold by the company and what is its turnover rate. The excess amount of carried inventory indicates the improvement of manufacturing efficiency, and the cost shortage on behalf of business growth.

**Fig. 2: Attributes of Management Accounting System Information**




Source: Self-developed

It is not important that only monetary variables can be counted, as responsible elements of business economy, there are also some non-monetary variables that must be evaluated. Therefore, MAS attributes can be taken in account as a recognition tool of non-financial variables in which customers' behaviour comes in priority list to manage labour turnover and organizational policy management (Balasubramanian *et al*., 2019). The major goal of the MAS attributes must be followed by the achievement of the business objectives that can help in setting proper business standards with various business activities. The failure of traditional financial accounting systems to meet all the business objectives properly necessitated the emergence of MAS that came to maintain the accuracy with proper cost management system (Kontsevoy *et al.,* 2020). Deviation in any operation can affect each individual attribute of the MAS process to meet the utmost business goals and can create several barriers in the way of development (Ismail *et al*., 2018a). This is the reason behind adopting MAS in most of the manufacturing firms for the growth of business financials along with the national economy.

Several studies have been conducted to evaluate the characteristics of MAS attributes information as different firms are using the system with different segments. The MAS attributes information characteristics need to meet the demand of organization information and a well-designed MAS provides information which is more detailed and timely (Abdel-Kader & Luther, 2008). The importance of MAS attribute information characteristics has been supported by several studies such as that of Chenhall and Morris (1986); Muslichah (2004); Gerdin (2005); Soobaroyen and Poorundersing (2008). These studies provide empirical evidence with regard to the importance of MAS attributes information. Chenhall and Morris, (1986) in their study on the perceived usefulness of MAS attributes, classified the information generated by MAS as scope, timeliness, aggregation and integration information. Chenhall and Morris (1986) found that the type of information perceived to be useful by managers was broad in scope. It involved integration and aggregation information. Similarly, Soobaroyen and Poorundersing (2008) examined the perceived usefulness of MAS attributes in manufacturing firms and came with the conclusion that managers in organization structure decentralization prefer to use MAS attributes of scope and aggregation. These results are contrary to the findings of Chenhall and Morris, (1986) whose results showed that managers prefer to use MAS attributes of scope. Also there is little evidence on corporate strategy and staff qualification in relation to how they influence MAS attributes (Haldma & Laats, 2002; and Muslichah, 2004). This study is focused on defining the MAS attribute information for the betterment of the manufacturing firm decision making based on the MAS attributes of scope and integration information.

*Organizational structure (Decentralization) and MAS attributes in manufacturing firms*

According to Celik *et al. (*2018), organizational structure influences the forms of control within the organization as people are arranged in hierarchy within the defined patterns of authority and responsibility. They further argue that in the small firm, centralization operates effectively, while in large firms' decentralization and divisionalization are the most effective modes of achieving organizational goals. In the meantime, while then economic condition is found with high competitive edge, local characters of the manufacturing industry are seemingly taking part in both national and global aspect to affect the economic landscape (Ben-Ner & Siemsen, 2017). From starting the manufacturing journey towards delivering products to the customers, a large number of stages can be found. Those stages have an important role to benefit the firms (Ajibolade, 2013b). Among all those stages, supply chain management and distribution channels play a vital role to keep the business operation on the right track (Novas *et al*., 2017). To meet the expected

accounting outcomes from each individual stage, though following a decentralized business pattern, it is important to generate a proper flow of information with proper control and planning process (Fardbastani, Allahdadi & Sharifi, 2018). Based on the first hypotheses segment, it can be said that decision-making process for positive decentralized organizational structure, firms must focus on their performance enhancement through MAS as it can help to enhance the relationship between integrated information and the scope of MAS attributes. Besides, coordination between various departments of manufacturing firms is being improved due to the delegate power of MAS management at both high and low level of contribution. This assumption led to the following hypothesis:

$H_{1a}$*: The organizational structure (decentralization) positively influences the MAS attributes of scope information in manufacturing firms.*

$H_{1b:}$ *The organizational structure (decentralization) positively influences the MAS attributes of integration information in manufacturing firms.*

*The Corporate strategy and MAS attributes in manufacturing firms*

The scenario in the manufacturing firms keeps on changing rapidly. The productivity and sales rate of business tend to be influenced by the fluctuation of financial structure at global context (Waweru & Uliana, 2008). In that case, the concerns of achieving high competitive advantages are also increasing thus forcing the manufacturing firms to implement effective business strategies. In so doing, it helps to achieve higher level of competition through sustainable process in the business market and attain business goals as planned (Jones & Riahi-Belkaoui, 2010). As different firms are perusing their different business policies, the adaptation of corporate strategies is dependent on those norms (Glushakova, Chernikova & Strekalova, 2020). Surveys are claiming that corporate strategies based on generic terms are somehow effective to create a strong relationship with the outer business market by achieving the expected competitive advantages (Kesumawati *et al*., 2019). While the MAS attributes information is focusing on providing information for decision and unnecessary expense controls, the cost leadership strategy is found helpful to reduce manufacturing costs and enhance profit level (Mortazavi, Rasoli Ghahrodi & Rostami, 2017). The production cost control is a key factor for success in manufacturing firms in order to be competitive in the market. Manufacturing firms that pursue a cost leadership strategy focus much on their efforts to reduce their economic costs below those of their competitors in the same industry (Jones & Riahi-Belkaoui, 2010). It can be said that corporate strategies could be considered effective when associated by key factors of business success. This background information leads to the following hypothesis:

$H_{2a:}$ *Corporate strategy positively influences the MAS attributes of scope information in manufacturing firms.*

$H_{2b:}$ *Corporate strategy positively influences the MAS attributes of integration information in manufacturing firms.*

*Staff qualification and MAS attributes in manufacturing firms*

The third hypothesis has been made focusing on the role of staff qualification by considering them as primary drivers of business success (Aliboli *et al.*, 2014). Since MAS has become a new trend in the business market and is being used for the enhancement of financial measures, its staff members are required to be educated properly in order to adopt the system easily (Hutahayan,

2020). The MAS attributes need firms to have a deep insight over the production cost and time-taking measures (Carter, 2017). In that case, the entire decision is dependent on staff and their quality of performance in terms of how much time they will take for a single activity and their various productivity enhancements. It has been found that shortage of staff qualification creates several challenges for the overall performance of manufacturing firms thus resulting into poor brand image and unexpected cost-expenses (Haldma & Laats, 2002). In this context, transformational leadership is useful as leaders can treat the employees well and can make them realize the vision of the business for which they are performing daily (Stoyanova & Iliev, 2017). Without proper guidance and support, the expected performance cannot be met by the employees and the implementation of MAS can get zero result. Therefore, this assumption led to the development of the following hypotheses:

$H_{3a}$*: Staff qualification positively influences the MAS attributes of scope information in manufacturing firms.*

$H_{3b}$: *Staff qualification positively influences the MAS attributes of scope information in manufacturing firms.*

*Research Model*

Based on the background information, the function of MAS attributes of scope and integration information in manufacturing firms is influenced by organization characteristics variables: organization structure decentralization, corporate strategy, and staff qualification. Based on the discussion above, in a hypothetical perspective, there are two models; Model I representing MAS attributes of scope information and model II, which represents the MAS attributes of integration information. Hence, the following operational model has been used in the research as elaborated below:

***Model 1:*** $MASScope=\beta_{0+}\beta_1 DEC_1+\beta_2 CST+\beta_3 Staff+E_1$

***Model 2:*** $MAS\ Integration=\beta_{20+}\beta_{21} DEC+\beta_{22} CST+\beta_{23} Staff+E_2$

*Where:* MASScope is indicating the Management Accounting System attributes of scope information.

MAS Integration is indicating the Management Accounting System attributes of integration information.

DEC is indicating organizational structure decentralization.

CST is indicating corporate strategy.

Staff is indicating staff qualification.

## RESEARCH METHODOLOGY

Global manufacturing industries and their accounting systems have a larger amount of biased overviews. This study used positivism philosophy in order to examine the relationship between MAS attributes and its impact on characteristic variables of manufacturing firms (Marsonet, 2019). Since the topic is related to accounting process, the paper is dedicated to evaluating the numeric concerns of different manufacturing firms in Tanzania. Therefore, quantitative data were used so as to get the exact numeric statics that can make data analysis more authentic (Dos Santos *et al.*, 2017). To meet the stratified sampling techniques, 344 manufacturing firms were selected as the target population that can deem the study with high significant measures.

*Measurement of independent variables*

Measurement is a process of assigning numbers to objects or observations, the level of measurement being a function of the rules under which numbers are assigned (Bryman, 2006). The independent variables were measured by using a multi–item five point Likert-type scale. The corporate strategy was measured through cost leadership or product differentiation strategies in order to observe the influence of corporate strategy in the area of costing (Porter, 1985). Staff's qualifications were measured categorically (Haldma & Laats, 2002; Ajibolade, 2013a). The organizational structure (decentralization) was measured based on the flow of authority within the organization. According to Ajibolade (2013a), in decentralization, the most frequently used measure is to test the delegation of authority in the organizational structure.

**Table 1. Measurement of Variables**

| Data group | Data Variable | Details | How Measured | Reference |
|---|---|---|---|---|
| Dependent Variable | Management Accounting System Attributes | -Scope information<br>-Integration information | Strength as perceived by the respondents using a Five-point Likert scale | Chenhall and Morris (1986), Muslichah (2004), Soobaroyen & Poorundersing (2008) |
| Independent Variables | Decentralization | Degree of decentralization<br>-Investment decision<br>-Finance<br>-Human resources<br>-Budget decision<br>-Priority in decision making<br>-Product quality<br>-Resource utilization<br>-Production system efficiency | Strength as perceived by respondents using a Five-point Likert scale | Ajibolade (2013), Chenhall and Morris (1986) Soobaroyen & Poorundersing, (2008) |
| | Staff qualification | Understanding of business environment | Categories, Five point Likert scale, categorical variable | Aliboli *et al. (*2014), Haldma & Laats, (2002) |
| | Corporate Strategy | -Priority in decision making<br>-Product quality<br>-Resource utilization<br>-Production system efficiency | Five-point Likert scale | Moores *et al*.,(1993), Ghasemi *et al*.,(2015) |

**Source**: Multiple (2017)

*Data Analysis*

The proposed variables of organizational characteristics and MAS attributes were used to collect data and information from the targeted survey. The structural equation mode (SEM) was used in this study to examine the connection between MAS attributes and the organizational characteristics variables (Durak & Saritepeci, 2018). In this regard, various key factors that influence the MAS attributes information in the manufacturing firms were identified. Despite having different ways of relating manufacturing firms, SEM appears to be an effective technique that relates those manufacturing firms. It does so by testing the entire variable as an individual set (Bryne, 2010).

## FINDINGS

*The manufacturing classification*

While manufacturing firms can be classified with different categories, it was important for this study to focus on those categories by examining them critically in relation to how they relate to manufacturing firms. In order to achieve this goal of examining the relationship between organizational characteristics variable and management accounting system attributes in manufacturing firms, a set of questionnaires was distributed in five regions of Tanzania: Tanga, Arusha, Kilimanjaro, Morogoro and Dar es Salaam. These regions were selected based on their importance in Tanzania's economic development in the manufacturing industry. The findings in Table 2 below show that the leading industry is building, refractory and cement with 81 (27.1%) organizations, followed by food and beverages, which accounted for 73(24.4%) organizations. On the other hand, the textile industry accounted for 34 (11%) organizations while paper and packaging as well as chemicals accounted for 30 (11.4%). The agricultural industry accounted for 26 (9%) organizations, while engineering industry accounted for 18 (6%) and pharmaceuticals for six (2%). Moreover, this study examined the ownership of manufacturing firms in Tanzania that were dominated by private sector following the economic liberalization. Table 2 shows that 296 (99.3%) of the interviewed manufacturing firms were owned by private sector, while only two (0.7%) were under mixed ownership. Table 2 summarizes the findings:

**Table 2: Manufacturing Classification**

| S/No. | Details | Category | Frequency | Percent |
|---|---|---|---|---|
| 1. | Manufacturing Classification | Food & Beverages | 73 | 24.4 |
| | | Engineering | 18 | 6.0 |
| | | Textiles | 34 | 11.4 |
| | | Pharmaceuticals | 6 | 2.0 |
| | | Chemicals | 30 | 10 |
| | | Building, refractory, cement | 81 | 27.1 |
| | | Agriculture | 26 | 9 |
| | | Paper & packaging materials | 30 | 10 |
| | | **Total** | **298** | **100** |
| 2. | Ownership structure | Private Sector | 296 | 99.3 |
| | | Mixed | 2 | 0.7 |
| | | **Total** | **298** | **100** |

Source: Field Data (2018)

*Reliability and Validity*

In this study, reliability and validity of data were tested using the Cronbach alpha, Confirmatory Factor Analysis (CFA), Average Variance Extracted (AVE) and Composite Reliability (CR). The measured variables in this study are organizational structure (decentralization), corporate strategy, and staff qualification. Dependent variables were measured through MAS attributes of scope and integration information. The findings show that, the Cronbach's reliability coefficients for all the variables are above 0.7. This amount of reliability coefficient is also supported by Nunnally (1979) who argues that, reliability has to be measured through an internal reliability coefficient ranging from 0 to 1. The purpose of CFA is to test the hypotheses about the structure factors, which include evaluating the parameter estimates and fit indices (Bryne, 2010). The fit indices are used to measure how well the data fits the model. Mande *et al*. (2013) contend that a good measure mode CMIN/DF should be less than 5. Another measure of a good mode should be GFI> 0.90 (Awang, 2006, Bryne, 2010); AGFI> 0.80 (Mande *et al*., 2013); CFI> 0.90 and RMSEA less or equal to

0.08 (Awang, 2006; Bryne, 2010; Mande *et al*., 2013). The study also used standardized regression weights and squared multiple correlations for the parameter estimates measure. As suggested by Bryne (2010), the standardized regression weight of each item should be above 0.50 and the squared multiple correlation of each item must be above the cut-off point of 0.40. In the study, CFA was conducted on the variables to examine their dimensionalities, which is a requirement under the SEM approach. The findings show that the evaluated variables meet the acceptable criteria for the model's fit (See appendix A).

The failure to test reliability and validity of the study can make future readers not to consider the study trustworthy for future researches. In this study, Average Variance Extract (AVE) and Composite Reliability (CR) were used to measure the reliability and validity of the overall study because a wider range of information was collected before integration (Harmoinen *et al.,* 2020). AVE followed a latent construct process to evaluate variance measures according to their relevance in this study. Thus, AVE helped the study to represent a favorable result while supporting the reliability of measurement items. When AVE has equal or more than 0.5, it is considered good (Mande *et al.,* 2013). The findings of this study show that the AVE estimates for all organizational characteristics variables are above 0.5. As suggested by Fan and Sivo (2007), the Composite Reliability (CR) was required to be above AVE. The findings show that CR ranges from 0.7 to 0.9, which is within acceptable levels. Table 3 below shows the findings for AVE and CR.

**Table 3: Cronbach Alpha, Composite Reliability (CR) and Average Extract Variance (AVE)**

| **S/N** | **Vary Variables** | **CcCC** Cronbach Alpha | **CcccC CR** | **VAB AVE/AVE** | **Org Decentralization** | **Corp Strategy** | **Staff qualification** | **s Mscss Mscope** | **Msint Ms integration** |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Organizational decentralization | | **0.90638** | **0.76529** | 0.9 | | | | |
| 2. | Corporate strategy | | **0.82** | **0.52923** | .206** | 0.72 | | | |
| 3. | Staff qualification | | **0.85** | **0.59** | .213** | .454** | 0.77 | | |
| 4. | Mscope | | **0.7466** | **0.50** | .242** | .497** | .478** | 0.71 | |
| 5. | Ms integration | | **0.79246** | **0.56** | .203** | .556* | .446** | .657** | 0.75 |

The shaded figures are the square root values of AVE

** Significant at 0.01

Source: Field Data (2018)

*Testing of Hypotheses*

The hypotheses were stated based on various factors on measures of relationship between individual variable set. By stating the hypotheses, the strength of those pairs has been examined critically. Hypothesis testing is important as different authors pursue different views over similar topics and choosing the authentic one from those views is somehow difficult (Purtukhia & Zerakidze, 2021). In this study, square multiple correlations were used to represent the differences between dependent and independent variables. The cut-off point used in an acceptable model was

a standard regression weight >.5. The entire testing has been done in a coefficient manner to strengthen the discussion.

*The organizational structure (decentralization) and MAS attributes of scope and integration information in the manufacturing firms*

The hypothesis above and its associated discussion demonstrate that there is a relationship between MAS attributes and organizational characteristics structure (decentralization). These strong bonds in such relationships are enhancing the information integration process in manufacturing firms and increasing the number of scopes at the same time. In examining the relationship between these two measures, a hypothesis was formulated focusing on positive and negative existence of such relationships. In this case, the regression output in Table 4 is showing that the relationship between organizational structure (Decentralization) and MAS scope attributes in manufacturing firms is increasing scopes with higher statistical significant role. Therefore, $H_{1a}$ is accepted. The regression weigh output in Table 4 reveals that the relationship between organizational structure (decentralization) and MAS attribute of integration information in the manufacturing firms does not seem to be statistically significant because $P>0.05$. Hence, $H_{1b}$ was not supported. However, the path coefficient, as depicted in appendix B, is positive; implying that these two variables are directly related.

*Corporate strategy and MAS attributes of scope and integration information in the manufacturing firms*

The concern of corporate strategy and its influencing role upon the integration information of manufacturing firms has also been examined in this paper. Therefore, $H_{2a}$ and $H_{2b}$ have been generated to test the objective right either in a positive or negative way. The discussion in literature review shows clear that corporate strategies are important in enhancing the firm's performances and improving MAS process. Besides, different corporate strategies have also been mentioned to clarify the situation and its significance. The overall discussion on specific measures is supportive of $H_{2a}$. The regression weight output in Table 4 has also added an extra value to the discussion to support it statistically while maintaining its significance. Thus, the findings show that hypothesis $H_{2a}$ was supported. Similarly, the findings in Table 4 show that the relationship between corporate strategy and MAS attribute of integration information in manufacturing firms seem to be statistically significant because $P<0.05$. Therefore, the findings supported $H_{2b}$.

*Staff qualification and MAS attributes of Scope and integration information in manufacturing firms*

Staff members are the major part of an organization, especially in manufacturing firms because the entire production quality depends on their individual performances. Based on their importance in the organization, $H_{3a}$ and $H_{3b}$ were to be formulated focusing on staff qualification in relation to how it relates to MAS attributes in manufacturing firms. As the results show the statistical result of P has come <0.05, it is indicating strong relationship between those aspects. The regression weight output in Table 4 evaluated that staff qualification has an important role in integrating MAS process in manufacturing firms with high significance. The findings imply that staff qualification and design of the MAS attributes seem to be statistically significant because $P<0.05$. Hence, $H_{3b}$ was accepted. Therefore, this finding implies that it is important to consider staff qualification when designing MAS attributes in the manufacturing sector. Table 4 summarizes the findings of the regression weight output. Therefore, hypothesis testing and results support the research model I, which shows that, $MASScope=\beta_{0+}\beta_1 DEC_1+\beta_2 CST+\beta_3 Staff+E_1$ and the findings show that the

results did not support the research Model II because the relationship between MAS Attributes of integration and organization structure decentralization is not significant. Hence, Model II was modified accordingly making it appear as follows: MASInt $=\beta_{20+}\beta_{22}CST+\beta_{23}Staff+E_{2.}$ The findings are summarized in Table 4 below.

**Table 4. The regression weights output for relationship between MAS attributes and organizational characteristics variable**

| Hypothesis | Relationship | Estimate | S.E | CR | P-Value | Remarks | Model |
|---|---|---|---|---|---|---|---|
| $H_{1a}$ | McopeT<--- DecT | 0.05 | 0.023 | 2.223 | 0.02 | Accepted | I |
| $H_{1b}$ | MinT<--- DecT | 0.035 | 0.028 | 1.25 | 0.21 | Rejected | II |
| $H_{2a}$ | MintT<--- CST | 0.57 | 0.084 | 6.815 | *** | Accepted | II |
| $H_{2b}$ | McopeT<--- CST | 0.381 | 0.068 | 5.608 | *** | Accepted | I |
| $H_{3a}$ | MintT<--- Staff | 0.364 | 0.1 | 3.642 | *** | Accepted | II |
| $H_{3b}$ | McopeT<-Staff | 0.337 | 0.083 | 4.053 | *** | Accepted | I |

***** means it is significant at 0.001**

Where DEC =organizational structure decentralization

CST=Corporate strategy

Staff= Staff qualification

MASSCOPE= Management Accounting System attributes of scope information

MASINTE= Management Accounting System attributes of integration information

Source: Field Data (2018)

## DISCUSSION OF THE FINDINGS

This study aimed at examining the relationship between MAS attributes of scope, integration information and organizational characteristics variables of manufacturing firms in Tanzania. Corporate strategies, decentralization structure and staff qualification were the variables this study focused on. The MAS attributes have been categorized into two categories: scope and integration information for Tanzania's manufacturing firms. The discussion of the findings in this study shows how organizational characteristics variables influence the scope of MAS attributes and information integration of manufacturing firms.

*Organizational structure (decentralization) and MAS attributes of scope and integration information in manufacturing firms*

The findings show that there exists a significant positive relationship between the organizational structure of decentralization and MAS attribute of scope information in manufacturing firms. The findings of this study resonate with other studies on MAS attributes in manufacturing firms (Chenhall & Morris, 1986, Soobaroyen & Poorundersing, 2008). Soobaroyen and Poorundersing (2008) investigated the relationship between decentralization and task uncertainty in manufacturing firms in respect of MAS attributes. They argued that there exists a positive relationship between organizational structure (Decentralization) and MAS attributes of scope, integration and timeliness in manufacturing industries. Moreover, Chenhall (2003) argues that decentralized firms use more administrative control tools and form patterns of communication. The findings further revealed that manufacturing firms that used decentralization structure perceived the scope information variable as useful for decision-making. The findings also show

that the relationship between organizational structure (decentralization) and MAS attribute of integration information is not significant. The findings of this study are inconsistent with Chenhall and Morris (1986) as well as Soobaroyen and Poorundersing (2008) who, in their studies, found that only the MAS attributes of integration and aggregation in manufacturing sector fit the decentralization structure. In their study, Soobaroyen and Poorundersing (2008) provide statistical evidence which supports the findings that the relationship between organizational structure and MAS attribute of integration is significant in manufacturing firms. Theoretically, as argued by Chenhall (2003), it is expected that integration information is important for decision-making in the decentralization structure. This result might be influenced by other factors such as decision-making, finance and risk management decision-making in manufacturing firms. Therefore, further research is required to provide more statistical evidence on this relationship.

*The corporate strategy and MAS attributes of Scope and integration information in manufacturing firms*

The findings reveal that the relationship between corporate strategy and MAS attribute of scope information is significantly positive. Also, the association between corporate strategy and the design of MAS attribute of integration information is significantly positive. These findings are supported by several MAS attributes studies (Moores & Mula, 1993; Chenhall 2003; Muslichah, 2004). When Moores and Mulla (1993) examined the relationship between MAS attributes and corporate strategy, they found a positive relationship between broad scope information and cost leadership strategy in manufacturing firms. In the same vein, Muslichah (2004) found a significant relationship between MAS attributes of integration information and corporate strategy in manufacturing firms. These findings imply that, for manufacturing firms to conquer their competitors in the market, they need information that can be used to prepare a corporate strategic plan. This finding is also consistent with the prior study by Chenhall (2003) who found that corporate strategy is crucial when designing MAS attributes in manufacturing firms. Most of the studies on the relationship between MAS attributes and corporate strategy try to link the information generated by MAS without establishing whether there exists a match or fit for effective functioning of manufacturing firms. Ghasemi *et al. (*2015) found out that a corporate strategy is a very important factor when designing MAS attributes because manufacturing firms need information for decision-making about market competition. Therefore, this finding meets the expectation of the study that manufacturing firms that prefer using corporate strategy to conquer the market competition will need scope and integration information for their decision-making.

*Staff qualification and MAS attributes of scope and integration information in manufacturing firms*

The relationship between staff qualification and MAS attributes of scope is significantly positive. The findings show that the relationship between staff qualification and MAS attribute of integration is significant. The findings of this study are inconsistent with several other studies on MAS. Aliboli *et al. (*2014) found a positive relationship between staff qualification and MAS design. They also found that the designing of MAS depends on staff qualification. In his study on Local Government Authorities in Tanzania, Chalu (2013) found that the effectiveness of the Accounting Information System is influenced by factors such as management support, Councillors' involvement and external auditors. This finding matches the theoretical explanation that it is important to consider human resources in order for systems to work properly. Also, staff members are expected to use a broad scope information characteristics or integration for decision-making in manufacturing firms. The findings of this study support the prediction of the study because the tested hypothesis shows staff qualification as an important factor when designing MAS

attributes in manufacturing firms. Therefore, the findings imply that, staff qualification and MAS attributes of scope and integration information are positively related.

## CONCLUSION AND SUGGESTIONS FOR FUTURE STUDIES

It is apparent that MAS attributes influence the performance level of manufacturing firms in Tanzania. The major cause that is lying behind this influence is that it is helpful to integrating most appropriate information and reducing the errors in the overall productivity. In deciding the adequate pricing segment for products, sales rates and day-to-day business operations; MAS attributes helps firms to make proper decision based on theoretical views of business management. In this context, the study focused on defining the aims and objectives of firms based on research demands. Using Contingency Theory, the study has unveiled the variables that determine the characteristics of the organization. Structural Equation Model technology has been used in the methodology section in order to reduce the errors and enhance the robustness. Thus, it has helped to compare the findings of this study to those of previous studies on the same or similar topics. Linear regression model was also used in order to get proper numeric results. The research Models I and II have represented the analysis report where the relationship between MAS attributes and various organizational variables was found with decentralized structure for better decision making. Thus, the findings have filled the research gap found in previous studies and therefore, it can be suggested that managers should focus on their perceived usefulness for promoting strong decision-making process inside the manufacturing firms.

Although this study focused on three contingent variables; namely, staff qualification, corporate strategy and organizational structure (decentralization), in future, further studies should examine other contingent variables such as organizational culture orientation, technology, organizational size and task uncertainty, that might influence the MAS attributes in manufacturing firms.

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## APPENDICES

### Confirmatory Factor Analysis Results

| Variable | Code | Item | Item selection criteria | | Mode Fit Indices | | |
|---|---|---|---|---|---|---|---|
| | | | weight regression | Square multiple Correlation | Goodness Of Fit Measure | Index* | Cut |
| Organization on structure decentralization | OrgD3 | Delegation | 0.786 | 0.617 | CMIN/df | 1.192 | <5 |
| | Org D4 | Decision regarding production decision | 1.003 | 1.006 | | | |
| | OrgD5 | decision regarding production decision | 0.817 | 0.667 | | | |
| | OrgD6 | Human resource decision | 0.045 | 0.00 | GFI | 0.988 | > |
| | OrgD7 | Decision regarding development of production system | 0.052 | 0.003 | AGFI | 0.973 | > |
| | OrgD8 | Risk Management decision | 0.055 | 0.003 | CFI | 0.997 | > |
| | | | | | RMSEA | 0.025 | < |
| Corporate Strategy | OCS2 | Improving Production Efficiency through batter utilization of resources | 0.622 | 0.387 | CMIN/df | 2.699 | |
| | OCS4 | Synchronizing the Production process to achieve lower costs | 0.514 | 0.264 | GFI | 0.966 | > |
| | ProD2 | Improving product quality by reducing products defects | 0.685 | 0.469 | AGFI | 0.931 | > |
| | ProD3 | Producing Unique products features that are different from those of competitors | 0.731 | 0.535 | CFI | 0.96 | |
| | ProD4 | Offering broad range of products than competitors | 0.8 | 0.64 | RMSEA | 0.076 | |
| | ProD5 | Broadening product availability in the market | 0.688 | 0.474 | | | |
| | | | | | | | |
| Staff's Qualifications | StaQ1 | Understanding the business environment | 0.751 | 0.564 | CMIN/df | 2.559 | |
| | StaQ2 | The staff have relevant knowledge about budgeting | 0.81 | 0.656 | GFI | 0.961 | |
| | StaQ3 | The staff have relevant knowledge about organizing and planning | 0.784 | 0.615 | AGFI | 0.929 | |
| | StaQ4 | Understand in of the importance of non-financial information for analysis | 0.723 | 0.523 | CFI | 0.94 | |
| | StaQ5 | Staff understand the business characteristics | -0.031 | 0.001 | RMSEA | 0.072 | > |
| | StaQ6 | Staff Understand the industry characteristic | 0.047 | 0.002 | | | |
| | | | | | | | |

**The developed Structural Equation Model (SEM) for Relationship between MAS attributes of scope and integration information**