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Information System Management and Zimbabwe Manufacturing Firms Performance. A Structural Equation Modeling Analysis

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ABSTRACT: There has been extensive research on how information communication technology (ICTM) management competencies might increase operational effectiveness. This study examined the impact of management ICT on the internal operations of a business, blending resource-based view (RBV) and dynamic capabilities theory (DCT) perspectives. The analyses in the study cover ICT support for management decision-making abilities on Harare's manufacturing operational firms' performance (OPF). Sustainable competitive advantage (SCA) is a mediator in the research model to enhance the firm's performance—data from 201 managers employed by the manufacturing firm informed the findings. The research hypotheses were tested using structural equation modelling (SEM) that was analysed using SPSS version 24 and AMOS version 21. The results reveal that investment in ICT should be linked to firms' core competencies to maximise firms' value. The results also indicate that effective management of ICT significantly impacts business performance by helping firms achieve sustainable competitive advantage. The study contributes to the literature by combining the RBV and DCT perspectives to explore the impact of ICT competencies on manufacturing firms' performance. The paper recommends that manufacturing firms in Zimbabwe invest more in information communication technology to compete effectively in global markets.

KEYWORDS: Competitive advantage, dynamic capability theory, information communication technology, ICT-enabled management competencies, manufacturing firms, operating performance, resource-based view, Zimbabwe

I. INTRODUCTION

Zimbabwe's National Development Strategy I (NDS-1) of 2019 aims to establish a digital economy by 2030. Economic digitalisation brings global innovation, competition, and growth across national institutions. As a result, Zimbabwe is experiencing an increase in digital business platforms that information communication technologies (ICT) enabled decision-making competencies could leverage to improve business organisations' competitiveness. Management knowledge that fosters positive managerial attitudes and acquiring relevant skills is essential for ICT adoption. Global clients' social and commercial habits are facing transformation, pioneering a digital enterprise orientation [1;2] (Gupta et al., 2020; Dlodlo & Mafini, 2014;). Macro and micro-enterprises in North America, Europe and Asia have merged their company strategies with various digital business platforms [3;4] (OEDC, 2019; Keller & Heiko, 2014). Zimbabwean businesses must employ digital transformation technologies; however, adopting ICT must accompany appropriate management learning, innovation and talent acquisition. Therefore, continuously learning, refreshing and upgrading ICT skills should significantly enhance the firm's operating performance and competitive edge [5; 6;7] (Ford, 2020; Bhuyan & Padhy, 2014; Tippins & Sohi, 2003).

Notwithstanding the country's economic crisis, Zimbabwe's ICT penetration exceeds the Sub-Saharan African average [8] (Dzindikwa & Kabanda, 2022). Most private business, public and development sectors use information management technologies [9] (Kabanda, 2014). Zimbabwean companies may use ICT to enhance production since they support the issues related to improving business performance. The World Bank's business sectors report asserts that Zimbabwe has more than 95% informal employment in micro-enterprises that are not in categories of either small to medium enterprises (SMEs) [10] (Ilieva et al., 2022). However, informal sector employment increases productivity by 5%, as claimed by [10] Ilieva et al. (2022), despite accounting for most employees. This disparity may be explained by assessing ICT capital investment in comparable groups to understand the specific challenges and craft appropriate improvement interventions. Zimbabwean mainstream economic sector

enterprises are likely smaller than SMEs in advanced technology nations. Hence the context from which actual knowledge applies might not be adequate to understand and have equal benefits when digitalisation transformation lags. ICT may help mainstream traditional enterprises cross the digital gap and increase efficiency by aligning the knowledge of ICT utilisation to the relevant contextual issues.

In Zimbabwe's previous Zim Asset 2013-2018 strategy for long-term socioeconomic development, small to medium enterprises (SMEs) were a key engine for projected target growth'. SMEs are laggards in adopting ICT systems as per the NDS-1 policy. In the Zim-Asset policy and NDS-I papers, ICTs have great potential to fuel economic growth and national policy initiatives. [8] Dzindikwa and Kabanda (2022) affirm that. SMEs' ICT capital investment benefits emerging economies like Zimbabwe. Apart from their importance in Zimbabwe, little is known about businesses' rate to use ICTs for productivity purposes in an integrative embedded manner other than for regulatory compliance. Companies, like banks, use e-banking and mobile banking in diverse ways. Zimbabwe has exploited ICT digital assets for transaction and compliance purposes rather than strategic resource utilisation. Business entities adopt these digital transformation applications in the informal and formal economic sectors and use contemporary ICT technology. Still, the ICT adoption extent is unknown or challenging in support of management competencies.

The general acknowledgement is that ICT positively impacts business competitiveness and the operating performance of firms (OPF) because, among other things, ICT affects how products and services are; discovered, designed, developed, distributed, and renewed for contextual fit. [4] Keller and Heiko (2014) argued that ICT influences the quality and quantity of goods and services produced, thus, directly contributing to organisational performance. Advances in digital technologies are occurring at a dizzying pace, requiring manufacturing firms to monitor and manage resources to keep up-to-date continually. Therefore, businesses must develop appropriate competitive strategies to thrive in fierce competition and shifting market conditions. Strategy evaluation is required to determine whether the process's satisfactory implementation has achieved the desired level of competitive advantage [11] (Collins, 2021). A competitive advantage allows for identifying an organisation's weaknesses and strengths, demonstrating the company's stability in capitalising on rivals' shortcomings. Manufacturing companies, like all other businesses, require a sustainable competitive advantage. To develop the capacity to obtain these advantages, a company or business organisation must analyse its resources and capabilities to determine its weaknesses and strengths [12] (Gerhart & Feng, 2021).

There has to date not been much research on information systems (IS) that distinguishes between the two mechanisms of ICT-enabled management (ICTM) competencies in developing countries' business organisations. First, ICT helps businesses to gain a competitive edge and improve operating performance by combining resources and capabilities incrementally and repeatedly. Second, extant literature does not thoroughly examine these characteristics' impact on a company's competitive edge, distinguishing this element from other aspects of a company's performance in developing countries such as Zimbabwe. Third, more studies are needed to understand the influence of information communication technology management (ICTM) resources and capacities. Thus, this paper analyses the direct effect of business organisations' ICT-enabled management competency on operating performance and the indirect relations among ICT-enabled management competency, competitive advantage and performance outcomes. The Zimbabwe manufacturing ICT management competencies case helps answer the three questions.

RQ1: Do ICT-enabled management (ICTM) competencies directly impact operating firm performance in Zimbabwe's manufacturing firms?

RQ2: Do the ICT-enabled management (ICTM) competencies directly affect the firm's competitive advantage?

RQ3: Do the competitive advantage effects on a firm's operating performance result from more interaction effects with ICT- enabled management (ICTM) competencies?

The following sections discuss the study hypotheses developed by reviewing the extant literature.

II. LITERATURE REVIEW

Many organisations operate in a competitive, complicated, unstable, dynamic business environment. As a result, several organisations began attempting to identify the source of competitive advantage that the Resource Based View (RBV) theory could explain. Thus, RBV describes sustaining a competitive advantage. [13] Barney (1991) asserts that organisations strengthen their competitive edge over time by strategically investing in human resources. RBV contends that an organisation's resources ultimately determine its viability, including its capacity for growth and competition. RBV argues that businesses could perform better with valuable resources and capabilities [14;13;15] (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). According to [16] Chatzoglouet al. (2018), RBV analyses and defines a company's competitive advantages based on its assets, knowledge, skills,

and intangible assets. The theory emphasises a company's use of internal resources to show that businesses have unique resources and capabilities that have value [17] (Alexy et al., 2018). Therefore, companies must devise plans to maximise their inner resources to gain a competitive advantage. [1] Gupta et al. (2020) concur that a company uses RBV to compete in an uncertain business environment by basing strategic decisions and options on internal resources and internal capabilities. Additionally, RBV traits are necessary for businesses to recognise their inner resources and skill sets as a source of long-term competitive advantage.

Organisations can gain a competitive advantage by transforming resources as sustainable [13] (Barney, 1991) or through a generic strategy [18] (Porter, 2007). RBV classifies a business's resources as organisational capabilities, intangible, and tangible resources [14] (Wernerfelt, 1984). Physical and easily identifiable natural resources include equipment, raw materials, cash on hand, and company locations [19;1] (Asri, 2021; Gupta et al., 2020). Although invisible, intangible resources, such as innovation, reputation, and human resources, are ingrained in the company's distinctive routines and practices [20] (Teece, 2014). Organisational capabilities pertain to a company's capacity to integrate tangible and intangible resources and transform inputs into outputs [21] (Barney & Hesterly, 2018). Two examples of organisational capabilities are superior product quality and sound financial management. [13] Barney (1991) states that internal resources that are valuable, rare, imperfectly imitable, and irreplaceable can provide a company with a sustainable competitive advantage.

In addition, the RBV lens is essential for comprehending the management competencies necessary to integrate ICT resources and capabilities into the business organisation. Scholars of strategic management, such as [22] Chandler (1969), define strategy as identifying a company's fundamental long-term goals and adopting the courses of action and resource allocation necessary to achieve these goals. This strategy lens emphasises utilising a company's resources and capabilities to achieve an unmatched set of core competencies. Thus, according to the RBV school, increasing a company's internal competence or capacity to have an adequate internal mechanism to offer products and services to key stakeholders will give it a significant competitive advantage [19;1,14] (Asri, 2021; Gupta et al., 2020; Wenerfelt, 1984). [21] (Barney & Hesterly, 2018) argue that RBV focuses on a company's resources and capabilities, such as ICT, to offer superiority over its rivals by creating a flexible competitive advantage to ensure sustainability. RBV contends that having the necessary resources gives a company a competitive edge and improves performance [13] (Barney, 1991).

The importance of RBV has been widely discussed and acknowledged in business literature [14;13;15] (e.g., Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). However, the critique for RBV presumes resource-related features "existence" while failing to address their generation, integration, distribution, renewal and reconfiguring cycle. Thus, RBV is claimed to be a static perspective that could be limiting businesses in creating dynamic capabilities and practical strategies to achieve their strategic goals and gain a sustainable competitive advantage [23;24;25] (Chen et al., 2021; Elkins et al., 2004; Kamukama et al., 2011). As such, dynamic capabilities theory (DCT) complements RBV's static environment viewpoint by adding a process systems approach. By assisting management in extending, altering, and reconfiguring current operational capabilities into new ones that better suit the environment, DCT deals with tumultuous environments. Scholars believe that dynamic capabilities include the procedures that give organisations the ability to maintain superior performance over time. Research into dynamic capabilities aims to clarify the sources of competitive advantage over time [26;27] (Teece 2007; Teece et al. 1997). Thus, the DCT's primary goal is firm performance. Ordinary capabilities or the firm's more extensive resource base may change as a result of dynamic capabilities, and this change may eventually result in a change in performance. Therefore, dynamic capabilities cannot explain performance; performance changes are the ones considered.

Dynamic processes fill these RBV knowledge gaps that fuel the quest for creating sustainable competitive advantage and improved performance. [20] Teece (2014) define a company's capacity to integrate, extend, and reorganise internal and external framework talents to meet rapidly changing situations. Dynamic resources enable a company to adjust its resource mix while maintaining its competitive edge by shielding it from changes in the business environment. Hence the need to sense and seize market possibilities, neutralise market threats, and reconfigure its strategies to create cost-effective strategies. RBV picks resources and capabilities, whereas DCT develops and renews them. From the DCT perspective, abilities, absorptive capacity, environmental turbulence, and adaptability determine a persistent competitive advantage.

Further, existing research demonstrates a link between ICT advancements and enhanced organisational performance. [28] Ravichandran and Lertwongsatien (2005) propose that the cumulative contribution of ICT support to core competencies may determine OPF. [29] Chege et al. (2020) argue that knowledge and alignment of ICT and business model are advantageous for Kenyan businesses. [30] Mndzebele (2018) confirms that the factors affecting the adoption of ICT by SMEs in Eswatini have risen to the top of the management agenda. [31] Ferreira et al. (2020) stated that fostering alignment between business and ICT goals could increase profitability and provide businesses with a sustainable competitive advantage. Further, according to [32]

Budiarto et al. (2017), the expanding digital economy necessitates that every organisation utilises efficient ICT resources and capabilities to generate value from ICT support for the firm's core competencies. This study argues that ICT alignment on business activities using the combined theoretical framework of DCT and RBV lens could sustain the competitive advantage by aligning information technology and business strategy to support vital organisational processes and operational objectives. Thus, DCT thinking extends the static perspective of the resource-based view (RBV) theory by ensuring that management actions adhere to a process that ensures sensing, seizing, and continuous transformative renewal that promotes internal and external environmental fit [27]. (Teece et al., 1997).

Further, DCT confirms that identifying opportunities through sensing mechanisms allows technological possibilities and technology development alignment. Seizing market possibilities could ensure the structural design and refining of the business model and appropriate committing resources. Such a strategic view helps management to anticipate competitor reactions and define intellectual property priorities. Thus, the ultimate dynamic attribute of transformation helps align structure and organisation culture through the investment decisions beneficial for additional capabilities. The confirmation of the value of ICT-enabled decision-making by several studies in different contexts places the need to investigate the role of management in the search for more knowledge on the link between ICT-enabled managerial decision-making and business performance operations within the turbulent Zimbabwean context. Thus, the integrative RBV-DCT methodology is used in this study to evaluate each company's competitive strategy. Manufacturing businesses must implement internal strategies that use company assets to provide a competitive advantage [23] (Chen et al., 2021).

III. THEORETICAL SUPPORT FOR THE HYPOTHESES AND RESEARCH MODEL

In the resource-based view (RBV), organisations have resources that provide a competitive advantage and superior long-term performance. RBV studies support the idea of management-enabled competencies as a process that goes via competitive advantage in developing resources and nurturing capabilities. For the RBV, a company's competitive advantage stems from its unique combination of scarce, valuable, and imitable resources [33;1] (Wernerfelt, 1995; Gupta et al., 2020). [34] Penrose (1959), the theory of the firm's basis is in the resource use that impacts organisational performance. [35] Barney (2001) contends that corporate resources include assets, capacities, procedures, traits, experience, and competition-related knowledge. Central to these resources are the intangible assets embedded in an organisation's human resources for its unique capabilities.

Scholars distinguish between ordinary and dynamic abilities. Dynamic capabilities are a company's continual integration, reconfiguration, renewal, and rebuilding of its resources and capabilities, and, most crucially, updating and reconstructing its core capabilities to retain a competitive edge [16] (Teece et al., 1997). [36] Barney et al. (2011) and [20] Teece (2014) suggest that market agility can be a competitive advantage for creating high-quality ICT applications fast and affordably. This critical managerial talent will decide the process and methods of technology implementation through emphasise directed to planning, design, delivery, project management, and standards and controls planning are all examples of ICT resources and capabilities [19;1;28] (Asri, 2021; Gupta et al., 2020; Ravichandran & Lertwongsatien, 2005). Thus, the administration of ICT resources and capabilities supports the redundancy reduction and improving consistency of organisational systems by aligning operations to the business model, strategy and value propositions. [1] Gupta et al. (2020) contend that ICT managers' business understanding and line managers' ICT abilities demonstrate their capability in adaptive decision-making processes that focus on value creation and delivery systems.

Decision-making in managing ICT resources and capabilities ought to be on knowledge-based skills, hence the import of human cognitive capacities as a focal management competencies lens. Competencies are firm-specific assets, knowledge, and skills, whereas abilities are critical to the business's structure, technology, processes, and relationships [21] (Barney & Hesterly, 2018). Competencies go beyond capacity. They enhance the development of competencies and capabilities in various alignments and integration of the firm's structure and intellectual and social domains [19] (Asri, 2021). Structural or functional competencies frequently develop managerial abilities using physical, human, and technological resources, directly and indirectly, to enhance intellectual and social capital [28;37] (Ravichandran & Lertwongsatien,2005; Grant, 1996). [38] Makadok (2005) argues that capacity is a non-transferable organisational resource that boosts output; as such, it offers a holistic, dynamic interactive process for sustaining competitiveness. Further, management ICT competencies can create a flexible and intelligent ICT infrastructure that could influence operational performance in the firm. Building such infrastructure by matching technology to an organisation's goals and leading to ICT-based business advantage necessitates management ICT expertise.

Management ICT competencies stress cognitive abilities that influence decision-making. They are trickled down on worker productivity and output by continuously growing the firm's intellectual capital pool of economically viable human

potential. Talented employees provide value to the organisation and provide low-cost empowerment that helps employees and the community. Thus, corporate knowledge investment generates intellectual capital. Training and development are analogous to physical capital in that well-trained employees boost production. Therefore, investing in human skills produces a qualitative and quantitative workforce to enable the firm to remain competitive and emphasise procedures, systems, and, most crucially, people acquisition and retention [39] (Al Ali et al., 2017). ICT may broaden senior managers' strategic management perspectives in finance, marketing, manufacturing, production, organisational growth, and new product innovation are balanced [40] (Kaplan & Norton, 1992). Management ICT skills involve knowing how computers, networks, programs, and people interact to achieve goals while noting that computers are engineering tools that enable firms to penetrate new markets by improving operational and dynamic capabilities. Non-productive ICT usage in businesses could be due to a weak relationship between ICT expenditures and financial performance [41;42] (Liang et al., 2010; Pavlou et al., 2005).

Therefore, for a firm to succeed, various human resources must develop ICTM skills to boost resource complementarities and integrate firm-specific competencies. These qualities improve customer relationship management systems, financial systems, human resource development, and organisational performance. Management should prioritise upgrading ICT infrastructure and information management skills, which are critical to boosting company performance. Hence this study following [28] Ravichandran and Lertwongsatien (2005) also suggest a three-pronged ICTM competencies construct of structural or functionality-related (FUN), intellectual or integrity-related (INT), and social connection skills as the market-access-related (ACC). Thus, dimensions for management ICT support for a firm's core competencies are FUN, INT, and ACC. The study focuses on the operational performance of the firm (OPF) for the dependent variable, Zimbabwean firm performance.

Therefore, as the first hypothesis (H_1), this study states that;

H_1: ICT-enabled management (ICTM) competencies are positively and significantly related to operating performance in Zimbabwean firms.

The first hypothesis (H_1) sub-hypotheses state that;

$H_{1.1}$: The relationship between ICTM functionality (FUN) competencies is positively and significantly related to operating performance in Zimbabwean firms.

$H_{1.2}$: The relationship between ICTM integrity (INT) competencies is positively and significantly related to operating performance in Zimbabwean firms.

$H_{1.3}$: The relationship between ICTM market-access (ACC) competencies is positively and significantly related to operating performance in Zimbabwean firms.

Today's market dynamics and complexity require current management ICT competencies and dynamic managerial capabilities for competitive advantage for operational company performance. [43] Wade and Hulland (2004) argue that information systems resources can approximate dynamic capabilities (DCT), which is advantageous for businesses that change quickly due to environmental uncertainties. Consequently, for the firm to have a long-term competitive advantage, its information systems (IS) resources must be aligned with the business model and ensure a dynamic fit between its internal and external environments. In turbulent times, developing, expanding, integrating, and releasing additional crucial resources may improve the company's long-term competitiveness. ICT could enable the firm to capture these changes and respond faster continually. Whereas [44] Ray et al. (2005) assert that failure to invest in ICT capabilities and resources locally or globally may hinder a company's ability to provide excellent customer service. Investments in ICT could help neutralise competition, seize market opportunities quicker, and enhance business processes and innovations as the firm benefits from internal and external learning to flourish in volatile markets [19;1] (Asri, 2021; Gupta et al., 2020). [45] Dehning and Stratopoulos (2003) contend that firms with strong management ICT abilities can preserve a competitive advantage and gain superior performance. Increased ICT management focus, business alignment, and ICT investments for company operations result from ICT resources and capabilities. [44] Ray et al. (2005) argue that management benefits from generic technology advancements by enhancing ICT organisational expertise. Therefore, to distinguish the organisation, [19] Asri (2021) advise stepping up value-adding operations, strengthening relationships with customers and suppliers to make it more difficult for them to leave, and establishing new businesses centred around services or products.

Three viewpoints are to assess the possibilities of ICT-enabled competencies directed to competitive advantages: (a) an organisation looking to improve efficiency and effectiveness aim at the reduction of costs (ROC); (b) an insider in the industry trying to outmanoeuvre rivals in a competitive conflict requires a firm to exploit market opportunities (EMO) to be competitive, and (iii) an outsider considering entering the market ensures that the neutralisation of competitive threats (NCT) is in check.

Thus, this study defines competitive advantage (CADV) as three-pronged to cover ROC, EMO, and NCT attributes. Based on the literature, management ICT (ICTM) enabled competencies could increase Zimbabwe's competitiveness.

Based on the preceding discussions, the following primary and secondary hypotheses can be derived: Thus, the second primary hypothesis is;

H_2: ICT-enabled management (ICTM) competencies positively and significantly influence Zimbabwean firms' competitive advantage.

The following sub-hypotheses relate to the above main premises;

$H_{2.1}$: ICT-enabled management (ICTM) competencies positively and significantly influence Zimbabwean firms' competitive advantage dimension of exploiting market opportunities (EMO).

$H_{2.2}$: ICT-enabled management (ICTM) competencies positively and significantly influence Zimbabwean firms' competitive advantage dimension of neutralising competitive threats (NCT).

$H_{2.3}$: ICT-enabled management (ICTM) competencies positively and significantly influence Zimbabwean firms' competitive advantage dimension of reducing costs (ROC).

Thus, management information research has developed dramatically during the last decade to generally accept the value of ICT for supporting performance and innovation. Though certain studies have shown a direct link between ICT and business performance, others have not. The extensive causal chain connecting ICT to corporate success and most studies ignoring critical intermediary organisational aspects that influence this relationship may explain conflicting results [19;1;25;28] (Asri, 2021; Gupta et al., 2020; Kamukama et al., 2011; Ravichandran & Lertwongsatien, 2005). As a result, the final inquiry possibilities are two-pronged. First, the direct relationship between competitive advantage (CADV) and operating performance of the firm (OPF); second, the indirect mediating effect of CADV between ICTM and OPF follows.

Thus, the study's third direct hypothesis is that

H_3: Hypothesis 3 H_3: Competitive advantage positively and significantly influences Zimbabwean firms' operational performance.

$H_{3.1}$: Competitive advantage Exploiting market opportunities positively and significantly influences Zimbabwean firms' operational performance.

$H_{3.2}$: Competitive advantage neutralisation of competitive threats positively and significantly influences Zimbabwean firms' operational performance.

$H_{3.3}$: Competitive advantage of reducing costs positively and significantly influences Zimbabwe's firms' operational performance.

Several studies have also demonstrated the mediating role of competitive advantage as an influence between IS and firm performance [19;1;25;28] (Asri, 2021; Gupta et al., 2020; Kamukama et al., 2011; Ravichandran & Lertwongsatien, 2005). As a result, the study argues that competitive advantage (CADV) mediates ICTM and OPF to then hypothesis 4 states that:

H_4: Competitive advantage positively and significantly mediates ICT-enabled management (ICTM) competencies on Zimbabwe's firms' operational performance.

The impact of competitive advantages on firm performance is positive.

H4.1: Competitive advantage positively and significantly mediates ICT-enabled management (ICTM) functionality competencies on Zimbabwe's firms' operational performance.

H4.2: Competitive advantage positively and significantly mediates ICT-enabled management (ICTM) integrity competencies on Zimbabwe's firms' operational performance.

H4.2: Competitive advantage positively and significantly mediates ICT-enabled management (ICTM) market-access competencies on Zimbabwe's firms' operational performance.

Thus, utilising a blended framework of resource-oriented theories, this study focuses on Zimbabwean manufacturing operational performance. The firm's operating performance (OPF), competitive advantages (CADV), and ICT-assisted management competencies comprise the conceptual underpinning for this study. This study's integrated conceptual framework addresses its principal research purpose from a resource-sponsored blended theoretical basis. The primary research examines how management ICT assistance for essential skills affects company performance. It also claims that embracing management ICT core competencies fosters integrity, capacities, creativity, innovation, and corporate performance. Thus, this study uses the OPF-ICTM conceptual framework to examine these links and organisational performance. The study's central hypothesis is that company performance depends on the match between its intangible resource portfolio, market entrance strategy, partner

connections, and organisational structure. The firm's managerial ICT competencies underpin all these characteristics. Figure 1 depicts these hypothetical research model linkages. Note that MICT in Figure 1 is similar to ICTM

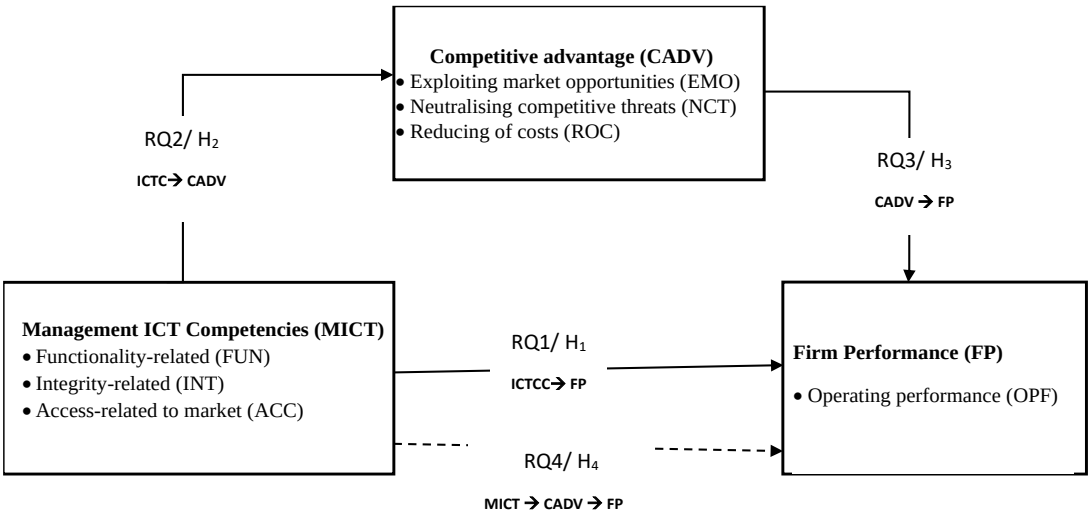

Figure 1: Conceptual research framework

IV. MATERIALS AND METHODS

A. SAMPLE

The sample size was determined using a confidence level of 95% and a margin of error of 5% [48] (Creswell & Creswell, 2017). Online surveys and probability-based stratified sampling helped determine the sample from an unknown population size of Harare manufacturing sector managers. This study surveyed 220 manufacturing managerial employees by distributing electronic questionnaires. 201 of 220 quantitative survey instruments were useful in examining how ICT management's critical abilities affect business performance. Harare-based manufacturing serves vital Zimbabwean sub-sectors, a good proxy for the general appreciation of ICT management competencies on firm operational performance. [48] Creswell and Creswell (2017) assert that questionnaires could cost-effectively capture meaningful data from scattered populations.

B. MEASURES

ICT-enabled management competencies (ICTM), competitive advantages (CADV) and operational performance (OPF) are primarily critical, independent variables. The ICTM consist of three factors comprising fifty-eight (58) items; market-access (9 items), integrity/intellectual (24 items) and functionality/ structural (25 items), adapted mainly from [44] Ray et al. (2005) and [28] Ravichandran and Lertwongsatien (2005). Several other scholars use similar measures [19;1] (Asri, 2021; Gupta et al., 2020). Three elements comprise CADV with thirty-seven (37) items, these being Utilisation/ exploitation of market opportunities (EMO) (13 items), neutralisation of competitors (NCT) (16 items), and reduction of costs (ROC) (8 items). CADV measurement items were sourced mainly from [46] Jeffers (2003), [44] Ray et al. (2005), [28] Ravichandran and Lertwongsatien (2005) and [49] Vargas et al. (2018). Some scholars also adapt similar elements for competitive advantage [19;1] (Asri, 2021; Gupta et al., 2020). The eighteen (18) components of operational performance (OPF), the dependent variable, are from several studies [19;1;50] (Asri, 2021; Gupta et al., 2020; Westerlund, 2020). These measures were initially for the technology adoption and marketing business with the implementation of the same in several organisational contexts [1;44;28] (Gupta et al., 2020; Ray et al., 2005; Ravichandran & Lertwongsatien, 2005).

C. RELIABILITY AND VALIDITY OF DIAGNOSTIC TESTS

The statistical analysis used IBM SPSS v24 AMOS v21 and SEM to diagnose the study model and determine the dataset's structure. Since regression cannot detect measurement problems and can inflate results [51] (Raykov & Traynor, 2016), SEM is appropriate because it can estimate correlations between variables. Using covariance matrices, SEM compares hypotheses to data. SEM includes model specification, identification, estimation, model fit evaluation, model modification, and results reporting [52;53;54;55] (Elrehail, 2018; Hair et al., 2017; Mataruka, 2022; Muzurura & Mutambara, 2022). Before evaluating hypotheses, researchers used confirmatory factor analysis (CFA). CFA determined the measuring variables' structure, properties, convergent, discriminant, and construct validity. This AMOS data analysis took fifteen (15) iterations to achieve model minimisation. In this cross-sectional study that includes mediation, SEM helped to uncover meaningful correlations [52;53]

(Elrehail, 2018; Hair et al., 2017). SEM facilitates the evaluation of intricate models, especially those that include mediators or moderators. Similar studies used this strategy [52;53;54; 55] (Elrehail, 2018; Mataruka, 2022; Muzurura & Mutambara, 2022).

To ensure the construct validity of the study instrument, we made substantial modifications to successful surveys that had previously examined similar components. Following the [56] Cooper and Schindler (2001) technique, ten senior-level manufacturing sector practitioners and marketing, management, and statistics professors reviewed the questionnaire to ensure its content validity. These experts provided the trustworthiness of research instruments. The respondents answered the questions using a five-point Likert scale (1=strongly disagree to agree 5=strongly).

[53] Hair et al. (2017) accept consistency ratings with a Cronbach's alpha (CA) of 0.7 or higher. CA values above 0.70 indicate that the data collection instrument in select Harare manufacturing employees is reliable.

V. RESULTS AND FINDINGS

More than 37.3% (75) of the participants were ICT professionals, 42.3% (85) of senior managers, and 20.4% (41) of executive ICT non-experts were adequate for the respondents' profiles. The results show that the study focused more on top management in the manufacturing sector. The working experience distribution of respondents is a good blend for less than 1 to-5 years is 44.77 per cent, category 5-10 years is 27.36 per cent, and 27.86 per cent, for ten years plus. Whereas 149 were male respondents (74.1%) and 52 were female respondents (25.9%). Male respondents dominated the manufacturing sector sample, according to the research findings.

A. Measurement Model and Tests of Hypotheses

After determining dependability, a measurement mode's fit to discover the potential factors to provide the desired SEM goodness-of-fit preceded the testing of the hypotheses. The model-appropriate indices showed excellent model-fitting index statistics. The Chi-Square Goodness-of-Fit and Degree of Freedom (CMIN/DF) values of 1.646 and the p-value of 0.057 fulfil the threshold values of less than three and more considerable than 0.05, respectively, demonstrating that the fitted model is acceptable. All other goodness-of-fit indices—Goodness-of-fit (GFI) (0.947 ≥ 0.90), Tucker Lewis Index (TLI) (0.981 ≥ 0.90), comparative fit index (CFI) (0.980 ≥ 0.90), Normed Fit Index (NFI) (0.944 ≥ 0.90), Standardised Root Mean Residual SRMR (0.048 < 0.05), and Roots Mean Square Error of Approximation (RMSEA) (0.057 ≤ 0.08)—meet the minimum values, indicating that the model is well-fitted [53] (Hair et al., 2017). The CFI and TLI were both more than 0.9. However, the SRMR and RMSEA were far below the recommended cutoff values of 0.08 and 0.06. Absolute fit measures include the RMSR, the SRMR, and the RMSEA. Lower "badness-of-fit indices" signify a better fit. Good correlation coefficients are between 0.05 and 0.08 and are less than 0.05. [53] (Hair et al., 2017). The criteria demonstrate the fitted model's validity and foretell the results use [57;58] (Khalid & Hunjra, 2015; Gaskin & Lim, 2016). Thus, the model fit indices are good and meet all the required threshold values. The research test model-appropriate indices for the measurement items and the structural equation statistics are in Table 1 below.

Table 1: Measurement model's goodness of fit indices

Model Fitness Test	Index	Recommended Threshold	Actual Fitted Model	
			Measurement items	SEM Model
Significance test	P-value	>0.05	0.057	0.276
Parsimonious test	PCMIN/DF	≤ 3	1.646	1.028
Incremental test	GFI	≥ .90	0.947	0.976
	TLI	≥ .90	0.981	0.999
	CFI	≥ .90	0.980	0.999
	NFI	≥ .90	0.944	0.975
Absolute test	RMR	< .05	0.048	0.014
	RMSEA	≤ .08	0.057	0.004

The factor loading for reliability and validity after fifteen (15) iterations yielded forty-three (43 out of 113) items for the model testing. The ICTM acceptable measures consist of three factors comprising eighteen (18 out of 58) items; market-access (4 out of 9 items), integrity/intellectual (5 out of 24 items) and functionality/ structural (9 out of 25 items). Three elements comprise CADV with twenty-one (21 out of 37) elements, these being utilisation/ exploitation of market opportunities (EMO) (7 out of 13 items), neutralisation of competitors (NCT) (8 out of 16 items), and reduction of costs (ROC) (6 out of 8 items). The four (4 out of 18) components of operational performance (OPF) are the dependent variable.

Average variant extract (AVE) values surpass 0.5, while Cronbach's Alpha (CA) values surpass 0.7. [53] Hair et al. (2017) reveal that these results imply that measuring item reliability is possible. The results of inter-construct correlations and the square root of AVEs are in Table 2.

Table 2: Constructs reliability, validity, and multicollinearity tests

Construct items	Cronbach's Alpha	Construct reliability	AVE[1]	ACC	EMO	FUN	INT	NCT	OPF	ROC
ACC	0.927	0.946	0.664	0.815						
EMO	0.714	0.822	0.537	0.004	0.733					
FUN	0.911	0.941	0.619	0.702	0.038	0.787				
INT	0.855	0.847	0.540	0.717	0.043	0.761	0.764			
NCT	0.875	0.894	0.587	-0.056	-0.024	0.033	-0.065	0.766		
OPF	0.780	0.850	0.533	0.101	0.611	0.099	0.164	-0.108	0.730	
ROC	0.787	0.831	0.509	-0.071	-0.172	-0.07	-0.096	0.033	-0.202	0.713

Key: [1]AVE is an abbreviation for average variance extract. AVE in bold and italics above the diagonal and squared correlations below the diagonal. The number in bold is the square root of AVE.

Table 2 findings suggest the existence of discriminant validity because the square root of the AVE values for all the variables are above the corresponding correlation coefficient values of other variables. All the inter-correlations are below 0.8, suggesting the absence of multicollinearity.

The various hypotheses tests used SEM to see if they were true. [59] Tabachnick and Fidell (2013) consider the normality assumption of multivariate statistics to be the most fundamental. Our test results demonstrate that all the research variables are typically distributed, per the distribution criterion, if their skewness value is less than three. The study reported a kurtosis value is less than ten [57;58] (Khalid & Hunjra, 2015; Gaskin & Lim, 2016). . Further, the result does not demonstrate multicollinearity among the variables. The data were subsequently statistically analysed using the SEM, which can accommodate latent variables because they are not immediately quantifiable and are not multicollinear. SEM is appropriate for mediation because utilising regression analysis is almost impossible because the conceptual framework gives a model with direct and indirect effects (mediating impact). SEM also enables fictitious testing of connections between theoretical structures and their empirical indications.

B. Sem Goodness of Fit Assessment

All SEM methods derive from the study model, which has constructed items based on practical measures. These include descriptive statistics, reliability tests, item measurement, and an SEM model evaluation. If the factor loading value of the SEM model is more than 0.6, the measurement item is valid. Management ICT competencies three variables functionality-related (FUN), intellectual-related (INT), and market-access-related (ACC), and competitive advantage's three variables exploiting of market possibilities (EMO), neutralising market threats (NCT), and cost-reducing measures (ROC), and firm operational performance (OPF), are measured. Cronbach's Alpha values from the model are shown in Table 2 above and are all above the threshold of 0.7. This study found composite reliability above 0.80. Thus, the results demonstrate the discriminant validity of the constructs tested using inter-construct correlations, latent variables, and the square root of average variance extracted values (AVE) for the aggregated data. Table 1 above provides the same threshold for the SEM goodness of fit indices.

The SEM good model, fit indices statistics, show that the fitted model is good because the CMIN/DF value of 1.028 and the p-value of 0.276 meet the threshold values. All other goodness of fit indices—GFI (0.976 ≥ 0.90), TLI (0.999 ≥ 0.90), CFI (0.999 ≥ 0.90), NFI (0.975 ≥ 0.90), RMR (0.014 < .05), and RMSEA (0.004 ≤ .08)—meet the minimum suggested values, indicating an excellent fitted model. The CFI and Tucker Lewis Index (TLI) were more significant than 0.9, and the SRMR and RMSEA were substantially below the recommended cutoff values of 0.08 and 0.06. The RMSR, SRMR, and RMSEOA are all absolute fit measurements (RMSEA). Low "badness-of-fit indices" indicate a better fit. Between 0.05 and 0.08 and less than 0.05 are good fits [53] (Hair et al., 2017). The criteria show the fitted model is sound and could anticipate the results' usefulness [57;58] (Khalid & Hunjra, 2015; Gaskin & Lim, 2016).

The data fitted well to the measurement items used in the study, as indicated by the SEM's goodness of fit indices. The SEM with its model parameters is in Figure 2 below.

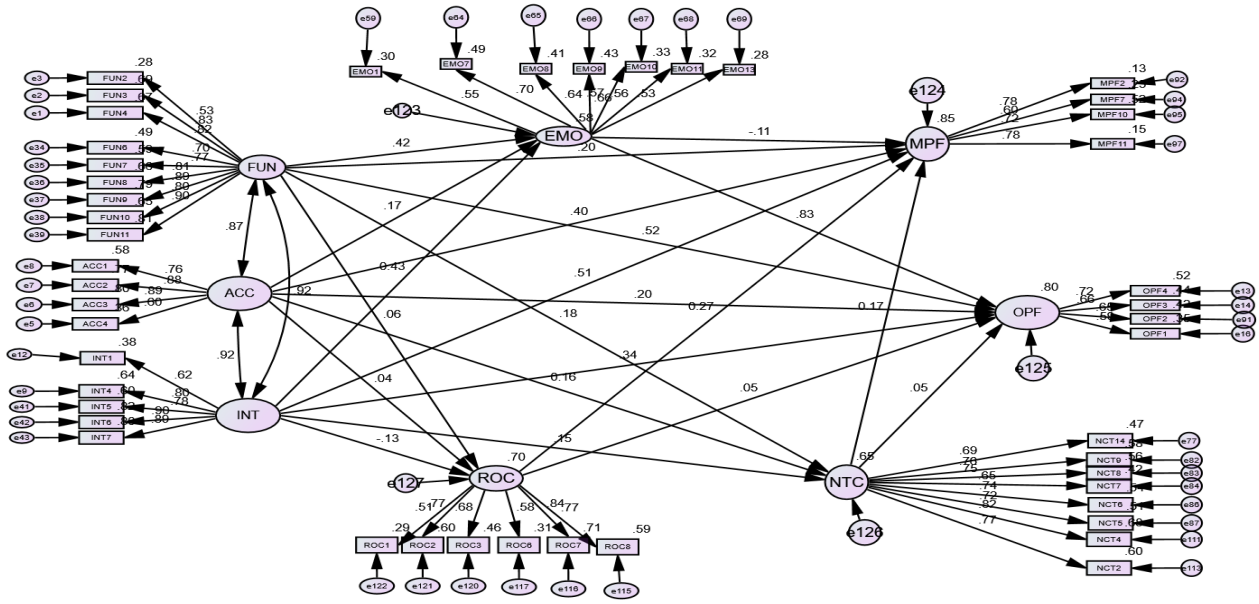

Figure 2: SEM with coefficients

C. Ict-Enabled Management Competencies and Operational Firm Performance

A positive and significant correlation exists between Management ICT competencies (ICTM= FUN, INT, ACC) and firm operational performance (OPF). Hypothesis statement ($H_{1.0}$ that $H_{1.1}$, $H_{1.2}$, $H_{1.3}$ represent) MIC's three variables' relationship with OPF. MITC for functionality-related core competencies (FUN) boosts both operational performances (OPF) by a co-efficient of 0.523 and a p-value of 0.011 ($H_{1.1}$ path FUN → OPF). The results indicate a 52.3% change in OPF for each shift in FUN units. Again, OPF estimates 0.341 co-efficient and p-value of 0.00 path ($H_{1.2}$ path INT →OPF) ICTM for integrity-related core competencies (INT) per unit change. OPF varies by 34.1% for each unit of INT. Each unit change toward OPF in MIC for market-access-related (ACC) has a coefficient of 0.204 and p-value of 0.00 path ($H_{1.3}$ path ACC →OPF). A single ACC unit upgrade increases OPF by 20.4%. The three sub-hypotheses support the central research claim (H_1) concerning the ICTM sub-variables FUN, INT and ACC related to the CADV sub-variables EMO, ROC, and NCT. Table 3 shows the relationship between the SEM's management ICT competencies to operational performance parameters.

Table 3: SEM's Management ICT competencies relationship operational performance parameters

Number	Hypothesis	Relationship	Coefficient	T- Statistics	P-values	Decision
1	$H_{1.1}$	FUN → OPF	0.523	2.540	0.011	Supported
2	$H_{1.2}$	INT → OPF	0.341	3.434	0.000	Supported
3	$H_{1.3}$	ACC → OPF	0.204	10.552	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

All measures of ICTM (FUN, INT, ACC) acceptably with OPF, positive, and statistically significant at the 10% level. They were positively correlated, indicating that if one variable increases, so do the other. Consequently, these assumptions are all supported, meaning that MITC positively affects operational firm performance (OPF). Table 3 above outlines the business performance implications of the Management ICT competencies hypothesis. All sub-hypotheses support the central hypothesis (H_1) regarding the ICTM sub-variables FUN, INT, and ACC.

D. Ict-Enabled Management (ICTM) Competencies and Competitive Advantage

There was a link between Management ICT competencies (ICTM→FUN) and competitive advantage (CADV). Hypothesis statement (H_2 represented by $H_{2.1}$, $H_{2.2}$, $H_{2.3}$, $H_{2.4}$, $H_{2.5}$, $H_{2.6}$, $H_{2.7}$, $H_{2.8}$ and $H_{2.9}$) regarding the relationship between ICTMs three variables and CADV's three factors. OPF.

i. Functionality competencies and Competitive advantage

ICTM's functionality-related (FUN) improves CADV for exploiting market opportunity (EMO) with a co-efficient of 0.422 and a p-value of 0.000 ($H_{2.1}$ path FUN →EMO), indicating a 42.2% change in FUN for every unit change in EMO. Path ($H_{2.2}$: path FUN → ROC) has a coefficient of 0.061 and a p-value of 0.000; for each unit change toward reduction of cost (ROC), FUN changes by

61%. Every upgrade to a FUN unit could boost ROC by 6.1%. Again, CADV's neutralisation competitive threats (NCT) estimates a route ($H_{2.3}$: path FUN → NCT) for every NCT per unit change with a coefficient of 0.180 and a p-value of 0.00. CADV's NCT fluctuates by 18.0% for every unit of MIC-FUN. The three sub-hypotheses support the central research claim (H_2) concerning the ICTM sub-variables FUN and the CADV sub-variables EMO, ROC, and NCT. Table 4 shows the SEM parameters discussed in this section.

Table 4: SEM's ICTM -functionality competencies relationship competitive advantage parameters.

Number	Hypothesis	Relationship	Coefficient	T- Statistics	P-values	Decision
4	$H_{2.1}$	FUN → EMO	0.422	14.150	0.000	Supported
5	$H_{2.2}$	FUN → ROC	0.061	7.925	0.000	Supported
6	$H_{2.3}$	FUN → NCT	0.180	9.608	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

ii. Integrity-related competencies and Competitive advantage

ICTC's integrity-related (INT) improves CADV for exploiting market opportunity (EMO) with a co-efficient of 0.433 and a p-value of 0.000 ($H_{2.4}$ path INT →EMO). A 43.3% change in EMO for every unit change in FUN. For path $H_{2.5}$: INT → ROC, has a coefficient of -0.134 and a p-value of 0.421 for each unit change toward reduction of cost (ROC). Every upgrade to an INT unit could boost ROC by negative 1.34 %, though statistically insignificant and unsupported. Again, CADV's neutralisation competitive threats (NCT) estimates a route (H_6: INT → NCT) for every INT per unit change with a coefficient of 0.152 at a p-value of 0.00. Thus, the result is positive and significant. CADV's NCT fluctuates by 15.2% for every unit of ICTM's INT. The three sub-hypotheses support the central research claim (H_2) concerning the ICTM sub-variables INT in relationship to the CADV sub-variables EMO, ROC, and NCT. Below, Table 5 shows the SEM parameters discussed in this section.

Table 5: SEM's ICTM -Integrity competencies relationship competitive advantage parameters.

Number	Hypothesis	Relationship	Coefficient	T- Statistics	P-values	Decision
7	$H_{2.4}$	INT → EMO	0.433	9.298	0.000	Supported
8	$H_{2.5}$	INT → ROC	-0.134	-0.805	0.421	Not Supported
9	$H_{2.6}$	INT → NCT	0.152	8.677	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

iii. Market-access-related competencies and Competitive advantage

ICTM s market-access-related (ACC) improves CADV for exploiting market opportunity (EMO) with a co-efficient of 0.172 and a p-value of 0.000 (H2.7 path ACC →EMO)—a 17.2% change in ACC for every unit change in EMO results. Path (H2.8 path ACC → ROC) has a coefficient of .44 and a p-value of 0.000 for each unit change in ACC toward reduction of cost (ROC). Every upgrade to an ACC unit could boost ROC by 4.4 %. Again, CADV's neutralisation competitive threats (NCT) estimates a route (H2.9 path ACC → NCT) for every NCT per unit change with a coefficient of 0.162 and a p-value of 0.0468, though statistically insignificant. CADV's NCT fluctuates by 15.2% for every unit of ICTM-ACC. The three sub-hypotheses support the central research claim (H_2) concerning the ICTM sub-variables ACC in relationship to the CADV sub-variables EMO, ROC, and NCT. Below, Table 6 shows the SEM parameters discussed in this section.

Table 6 SEM's ICTM -market-access competencies relationship competitive advantage parameters.

Number	Hypothesis	Relationship	Coefficient	T- Statistics	P-value	Decision
10	$H_{2.7}$	ACC → EMO	0.172	8.266	0.000	Supported
11	$H_{2.8}$	ACC → ROC	0.044	11.169	0.000	Supported
12	$H_{2.9}$	ACC → NCT	0.162	0.726	0.468	Not Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

E. Competitive Advantage and Operational Firm Performance

There was a link between competitive advantage (CADV) and operational company performance (OPF). H3.1, H3.2, and H3.3 represent the hypothesis statement (H3) regarding the relationship between CADV's three variables and the dependent OPF variable. OPF estimates a route ($H_{3.1}$ path EMO → OPF) for every exploitation of market opportunity (EMO) per unit change with a coefficient of 0.114 and a p-value of 0.00. OPF fluctuates by 11.4% for every unit of EMO. Path ($H_{3.2}$ path ROC → OPF) has a

coefficient of 0.253 and p-value of 0.442 for each unit change toward OPF in reduction of cost (ROC). Every upgrade to a ROC unit could boost OPF by 20.4%. Regrettably, this research claim is statistically insignificant and is not supported. Again, CADV for neutralisation of competitive threats (NCT) improves operational performance (OPF) with a co-efficient of 0.351 and a p-value of 0.000 ($H_{3.3}$ path NCT →OPF). Thus, a 35.1% change in OPF for every unit change in NCT will result.

Two measures of CADV metrics (EMO, NCT) correlated positively with OPF and were statistically significant at the 1% level. The result shows a positive correlation, which indicates that when one variable increases, so do the other. Therefore, two sub-hypotheses ($H_{3.1}$; $H_{3.3}$) are supported, demonstrating that CADV positively impacts operational business performance (OPF). The three sub-hypotheses support the central research claim (H_3) concerning the CADV sub-variables EMO, ROC, and NCT in relationship to OPF. The model parameters for the tested hypothesis are in Table 7.

Table 7: SEM Competitive advantage and operational firm performance parameters

Number	Hypothesis	Relationship	Coefficient	T- Statistics	P-value	Decision
13	$H_{3.1}$	EMO → OPF	0.114	15.295	0.000	Supported
14	$H_{3.2}$	ROC → OPF	0.253	0.769	0.442	Not Supported
15	$H_{3.3}$	NCT → OPF	0.351	15.870	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

F. Ictm and operating performance (opf) mediated by cadv factors.

ICT-enabled management competencies (ICTM = FUN, INT ACC) moderate the relationship between the operational performance of the firm (OPF) and competitive advantage (CADV=EMO, ROC, NCT).

i. CADV's EMO factor mediates ICTM and the firm's operating performance (OPF).

The results show that the median effect of EMO among all factors of ICTM (FUN, INT, ACC) are positive and statistical significance at a 5% confidence level with values at ($H_{4.1}$ path FUN→EMO→OPF) 94.7%. The coefficients for EMO-mediating ICTM's functionality-related core competencies (FUN) are a coefficient of 0.947 at p = 0.000 for operational performance (OPF). The coefficient for EMO-mediated ICTM help for integrity-related core competencies (INT) at ($H_{4.2}$ path INT→EMO→OPF) is 0.262 and at a p-value of 0.001. A confidence level of 1% positively and significantly supports the relationship. The coefficients for EMO-mediated ICTM help for market-access-related core competencies (ACC) are 0.035 at a p-value of 0.00 (OPF). Thus, at ($H_{4.3}$ path ACC→EMO→OPF) respectively positively and significantly supported at 5%. An estimated 3.5% change in ACC's relationship to OPF is due to EMO mediation. Table 8 below shows the coefficient and p-value for the related paths.

Table 8: Indirect hypotheses results in the mediating effect of EMO between ICTM and OPF

Number	Hypothesis	Relationship	Coefficient	T-Statistics	p-Values	Decision
16	$H_{4.1}$	FUN → EMO → OPF	0.947	8.597	0.000	Supported
17	$H_{4.2}$	INT → EMO →OPF	0.262	3.094	0.001	Supported
18	$H_{4.3}$	ACC → EMO → OPF	0.035	8.690	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

ii. ICTM and operating performance of the firm (OPF) mediated by CADV's ROC factor.

The result in Table 9 below indicates that ROC mediates the relationship of ACC between OPF is positive and statistically significant confidence level at 1%. ACC's associated mediation indirect paths are ($H_{4.6}$ path ACC→ROC→OPF) at a co-efficient of 0.037 at a p-value of 0.000. Paths ($H_{4.4}$ for INT→ROC→OPF) and ($H_{4.5}$ for ACC→ROC→OPF) respectively not supported in this study.

Table 9: Indirect hypotheses results in the mediating effect of ROC between MITC and OPF

Number	Hypothesis	Relationship	Coefficient	T-Statistics	p-Values	Decision
19	$H_{4.4}$	FUN → ROC → OPF	0.013	1.019	0.308	Not Supported
20	$H_{4.5}$	INT → ROC → OPF	0.022	1.540	0.123	Not Supported
21	$H_{4.6}$	ACC → ROC → OPF	0.037	7.091	0.000	Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

iii. CADV's NCT factor mediates ICTM and operating performance (OPF)

Table 10 shows that NCT mediates the relationship between FUN and INT between OPF with a positive and statistically significant confidence level of 5%. Thus, EMO's mediation effect has a greater extent than NCT and ROC in that respective order. This result indicates that EMO mediates ($H_{4.1}$ path FUN → EMO → OPF) by a more significant percentage at 94.7% than ($H_{4.7}$ path FUN → NCT → OPF) at a less percentage of 10.4% and ($H_{4.4}$ path FUN → ROC → OPF) at even a less rate of 1.3%. Note that the mediation effect of all three variants of EMO, two variants of NCT and one variant of ROC is positive and statistically significant at a confidence level of 5%.

Table 10: Indirect hypotheses results in the mediating effect of NCT between ICTC and OPF

Number	Hypothesis	Relationship	Coefficient	T-Statistics	p-Values	Decision
17	$H_{4.7}$	FUN → NCT → OPF	0.104	4.507	0.000	Supported
20	$H_{4.8}$	INT → NCT → OPF	0.157	2.38	0.032	Supported
21	$H_{4.9}$	ACC → NCT → OPF	0.019	1.127	0.281	Not Supported
Note that: *** p< 0.01, ** p < 0.05, * p < 0.1						

VI. DISCUSSIONS

Companies with poor performance may adopt resource-based strategies frequently and automatically. Thus, company decision-makers must align competitive advantage, exceptional performance, and competitive advantage sources are distinct ideas. Superior EMO, NCT, and ROC constitute a competitive advantage (CADV). Both MPF and OPF beat industry norms.

Numerous model measures connect ICTM to CADV and OPF. Our data supported disaggregated H_1 variants FUN→OPF ($H_{1.1}$), INT →OPF ($H_{1.2}$), and ACC→OPF ($H_{1.3}$). For H_2 variants for FUN→EMO ($H_{2.1}$), FUN→ ROC ($H_{2.2}$), and FUN→NCT ($H_{2.3}$). H_3 variants EMO→OPF ($H_{3.1}$) and NCT→OPF ($H_{3.3}$). H_4 forms were EMO mediating FUN→EMO→OPF ($H_{4.1}$), INT→EMO→OPF ($H_{4.2}$), and ACC→EMO→OPF ($H_{4.3}$). Again, H_4 forms were ROC mediating ACC→ROC→OPF ($H_{4.6}$), and NCT mediating FUN→NCT→OPF ($H_{4.7}$), INT→NCT→OPF ($H_{4.8}$). The ICTC→CADV→OPF route mediation study concurs with the findings by [54] Mataruka (2022), [60] Shafiee (2021); [39] Al Ali et al. (2017), and [28] Ravichandran and Lertwongsatien (2005). [54] Mataruka (2022) and [60] Shafiee (2021) asserted that competitive advantage arises in firms that deploy intangible assets in FUN, INT, and ACC competencies.

EMO techniques enhance organisational success and innovation. [61] Bozic and Dimovski (2019) reported the distinctive competitive advantage of market-access competencies and operating firm performance, mediated by the firm's agility to exploit market opportunities, is not supported. NCT and ROC mediate between ICTM and OPF in various and distinct ways. EMO, NCT, and ROC's use of ICT indicates how they contribute to enhancing enterprise capabilities. These ICT resources boost the organisation's assets' worth. Thus, EMO, NCT, and ROC acts directed by ICT enhance competitiveness ([61] Bozic and Dimovski (2019) and [62] Nwankpa & Roumani, 2016).

The analysis of primary data from 201 managers of manufacturing firms in Harare, Zimbabwe, shows that market-access-related capabilities (social capital) positively affect competitive advantage and that competent integrity-related ability (human capital) positively affects both competitive advantage and firm performance of Zimbabwe firms. Also, research shows that a reputation that focuses on functionality-related capabilities improves both competitive advantage and performance. Further, similar to [54] Mataruka (2022) and [61] Bozic and Dimovski (2019), the results show that a firm's performance during uncertainty is enhanced by having a dynamic competitive advantage attitudinal skill. These results give us essential information about RBV blended with DCT and human capital theories and back up the idea that human and social capital resources are critical to the success of Harare firms over long periods. This knowledge can be beneficial for strategic manufacturing business managers. This knowledge helps them strengthen their firms' positions in emerging markets when times are tough.

Better ICT support for core competencies raises switching costs and customer loyalty, which reduces marketing costs. Even if ICT assistance rises, prominent ICT companies may impose switching fees and place a premium on client loyalty over financial success. ICT support for crucial individuals can help companies acquire complete client knowledge and preferences while decreasing business search costs. This extensive expertise may allow a business to enter a new market at a reasonable economic value. These are just a few examples of how ICT assistance for core competencies can increase profits or reduce expenses in the Internet age.

Managers must identify, develop, protect, and use unique firm resources and capabilities, market positions, and mobility barriers to achieve competitive advantage (i.e., above-average market opportunities, neutralising competitive threats, and cost reduction) and superior performance (i.e., above-average financial and operational performance). [63] Mataruka et al.

(2023), [60] Shafiee (2021); [39] Al Ali et al. (2017), [64] Kirrane et al. (2017) concur that core competency-aligned innovation is managerial support for organisational changes and employee motivation to generate new ideas. Management ICT support for corporate knowledge expansion is crucial for sustaining competitive advantages and achieving excellent business performance, as revealed in the results.

[35] Barney (2001) suggested that businesses with unique resources or abilities enjoy a sustained competitive advantage. Scholars believe that ICT proficiency enhances core skills and identifies extraordinary performance implying that core competencies are critical organisational capabilities. RBV asserts that a one-of-a-kind, non-replicable ICT capability can improve corporate performance. As such, managerial decision-making must focus on reconfiguring its strategies to remain above industry performance. However, there is evidence that how ICT competency employs other business resources and competencies might explain disparities in firm success, similar to the findings by [65;28] (Radhakrishnan et al., 2008; Ravichandran & Lertwongsatien, 2005). The study found that despite the benefit of ICT skills, they may indirectly diminish the value of other organisational assets or competencies if embedding ICT fails to align with ICT resources and capabilities to the business model strategic tenets.

This study also demonstrates that a company's competitive advantage subtly influences the effects of ICT applications on its fundamental capabilities and performance. Similarly, [61] Bozic and Dimovski (2019), [29] Chege et al. (2020) and [31] Ferreira et al. (2020) contend that businesses must comprehend competitive advantage and ICT capability in an intertwined manner. This research discovered that strategically implementing ICT to support fundamental competencies and organisational effectiveness is a strategic top managerial decision-making domain. Companies that invest in ICT resources and capabilities can better integrate digital consumer data with new procedures and investments to enhance the customer experience, competitive advantage, and long-term performance.

VII. CONCLUSION

Consequently, it is essential to determine if these results accurately reflect the development of Zimbabwean ICT organisation abilities. The maturity of ICT has reached a stage where ICT resources and experience may no longer enhance company performance in isolation of business models and strategies that align with ICT systems and infrastructural tools. The Internet, outsourcing, especially offshore outsourcing, enterprise resource planning (ERP) systems, and cheaper PCs have all made ICT more accessible and uniform. Therefore, the costs associated with maintaining and marketing a strong brand may have a detrimental effect on ROC in Zimbabwe relative to favouring EMO and NCT. Despite their importance in Zimbabwe, industrial businesses have recently embraced ICTs to increase localisation and global competitiveness.

In the NDS-1 agenda, management ICT competencies could increase productivity. The country's low worldwide innovation ranking and lack of economic growth since the turn of the Century are regrettable [10] (Ilieva et al., 2022). Despite their digital transformation objectives, manufacturing businesses lag behind other non-financial sector organisations in adopting and deploying ICT, notably e-business digital technology. There are several assumptive explanations for management ICT and market restrictions. Inability to get financial and human resources, apply appropriate and specific external technological capabilities, and recognise ICT benefits [8;54] (Dzindikwa & Kabanda, 2022; Mataruka, 2022). Flexible manufacturing, lean and agile logistical services, employment, new ideas, concepts, technological innovation, collaboration in a free market economy, and corporate development and success are all enabled by information management [9] (Kabanda, 2014). Due to their reliance on imported ICT capital and raw materials, most Zimbabwean businesses lack liquidity, foreign cash, trained labour, international knowledge transfer, government backing, and enabling laws [9; 54] (Kabanda, 2014; Mataruka, 2022). A lack of competitiveness, expertise, infrastructure, and resources may explain Zimbabwe's sluggish digital adoption. This macroeconomic issue gives foreign businesses competing in the same markets an edge [55] (Muzurura & Mutambara, 2022).

VIII. RECOMMENDATIONS

This study shows that ICT use in Zimbabwe has primarily benefited manufacturing companies' operations more than aligning with their holistic company's strategic goals. For ICT-enabled managerial competencies to significantly impact firm performance, firms need complementary strategic capabilities. However, the research is cross-sectional and manufacturing sector-specific, with limited comparative results in other essential sectors. Consequently, the inferred conclusive cause-and-effect linkages can be from the data. The data lack an understanding from a longitudinal process perspective, and further research is necessary.

MANAGERIAL IMPLICATIONS: The analysis of primary data from 201 managers of manufacturing firms in Harare, Zimbabwe, shows that market-access-related capabilities (social capital) positively affect competitive advantage and that competent integrity-related ability (human capital) positively affects both competitive advantage and firm performance of

Zimbabwe firms. Also, research shows that a reputation that focuses on functionality-related capabilities improves both competitive advantage and performance. The results show that a firm's performance during uncertainty is enhanced by having a dynamic competitive advantage attitudinal skill that stretches beyond the theorised RBV notion. Moreover, this study contributes to the ICT literature by demonstrating that ICT-enabled management competencies complement the special ICT tools insufficient to establish and maintain a competitive advantage. For ICT-enabled managerial competencies to significantly impact firm performance, firms need complementary strategic capabilities.

THEORY IMPLICATIONS

These results provide essential information about RBV blended with DCT. Though further combinations with the knowledge-based view (KBV) and human capital theory (HCT) backed up the idea that human and social capital resources are critical to the success of Harare firms over long periods. This knowledge can be beneficial for strategic manufacturing business managers. This knowledge helps managers strengthen their firms' positions in emerging markets when times are tough. Moreover, this study contributes to the ICT literature by demonstrating that ICT-enabled management competencies complement the insufficiencies inherent within the ICT tools to establish and maintain a competitive advantage beyond intellectual managerial capital. Hence an opportunity for developing a more integrated theoretical basis that aligns with the gains of digital transformational strategies arises. A contextualised, resource scarcity-sensitive conceptual framework might be advantageous for the micro to small- to medium-sized businesses that dominate emerging nations like Zimbabwe.

The resource-based view (RBV) contends that having the necessary resources gives a company a competitive edge and improves performance [13] (Barney, 1991). The RBV perspective aids businesses in creating dynamic capabilities and practical strategies to achieve their strategic goals and gain a sustainable competitive advantage [23;24;25] (Chen et al., 2021; Elkins et al., 2004; Kamukama et al., 2011). The importance of RBV has been widely discussed and acknowledged in business literature [14;13;15] (e.g., Wernerfelt, 1984; Barney, 1991; Peteraf, 1993). RBV has been used in all business functional areas, including manufacturing and operations management, despite its initial recognition in strategic management. Therefore, the value could arise for a policy opportunity to create a digitally enabling infrastructural environment.

POLICY Due to ICTs' integration and market access capabilities, business digitisation and innovation may assist the informal sector in shifting resources to the more efficient formal industry and improve their productivity. Productivity drives economic growth and improves living standards [10] (Ilieva et al., 2022). The national economy's resource use is inadequate since the productivity of informal companies is just 5% [10] (Ilieva et al., 2022). This digital transformation national strategy in the NDS-1 policy could assist firms in using ICT to gain a long-term competitive edge and commercial success. Despite globalisation, ICT digital innovation is minimal in Zimbabwe's industrial enterprises due to a lack of ICT management coordination beyond compliance and active pursuits, which limits creativity and performance.

LIMITATIONS

The research has limitations. First, a concentration on manufacturing restricts its reach. While manufacturing is essential for most emerging nations, a future empirical studies agenda may concentrate on other industries, particularly those in less-formalised economic sectors. Second, the study used the RBV as a theoretical lens to understand numerous literary concepts. Even though some academic difficulties are emphasised, their impact on the fundamental RBV lens was modest to increase the generalizability of the results. A prospective study might explore the relationship between small-size multi-industrial-sector-based firms and ICT management orientation from a different theoretical perspective.

This study's disaggregated approach confirms previous research demonstrating a correlation between corporate performance and ICT capabilities, but it is too soon to proclaim the relationship a success. The study's findings differed from those of other studies for three reasons. (1) ICT's role and value have changed, making it a weaker predictor of business performance; (2) emphasising the importance of management knowledge and abilities in using ICT technologies in a single industry with heavy ICT usage is limiting; and (3) the cross-sectional design of the study coincided with Zimbabwe's first COVID-19 pandemic lockdown, which may have influenced respondents' perspectives.

Therefore, the digital business model may aid managers in understanding the issues that relate to embedding ICT strategies. With ICT capital, manufacturing businesses may use digital platforms to market, promote, produce, and exchange resources, information, expertise, and trust. As companies recover from the recent and ongoing economic shock aggravated by the COVID-19 pandemic, a digital enterprise may help them satisfy customer needs and build confidence. Zimbabwean firms may now directly access various worldwide markets thanks to the multi-currency economy and better national ICT infrastructure

investment policies. Outside Zimbabwe, companies with the appropriate guidelines, strategies, abilities, and resources target these markets.

DECLARATION OF CONFLICTING INTERESTS

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