

Innovative Manufacturing Systems and Business Sustainability in the 21st Century (A Critical Evaluation of the Champion Breweries Plc, Nigeria)

Dr. Williams Abasiubong (Author¹)
Senior Lecturer, Dept of Business Management,
University of Uyo, Nigeria.

Johnson Odohoedi (Author²)
Dept of Business Mgt,
University of Uyo, Nigeria.

Imaabong Asuquo Williams (Co-Author³)
Dept of Business Mgt,
University of Uyo, Nigeria.

Abstract:- A modern manufacturing system adopted by a company is a necessary condition for a firm overall corporate health. This paper is focused on evaluating the innovative manufacturing practices of Champion Breweries Plc, a food and beverage company in Nigeria. A descriptive survey design was found suitable for this study. Primary data were collected through the administration of questionnaires to the sampled population of 132 employees of the company. Data were analyzed using a linear multiple regression model. The analysis results show that the null hypothesis which states that there is no significant effect of digital and emerging platforms on business sustainable development was rejected because the calculated T-statistics of 2.90 at 0.004 p-value indicated a positive significant impact of digital and emerging technologies on business sustainability. Contrarily, hypothesis two results indicated no clear evidence that continuous improvement influences business sustainability at a p-value of 0.11. We observed that integrating emerging technologies into the company's production system while keeping the firm's innovative ecosystem robust enhances operational efficiency. Based on the findings, we resolved that innovative manufacturing techniques improve societal well-being, lower risks to the environment, and increase the effectiveness of production factors thereby raising the standard of living of the employees and increasing shareholders' wealth. We recommended that modern business tools, methods, and systems should be applied in all facets of an organization as catalysts for business sustainability.

Keywords:- Business Sustainability, Continuous Improvement, Digital Technology, Shareholder's Wealth, Innovation, Manufacturing Practices, Sustainable Development.

I. INTRODUCTION

Business performance in the manufacturing sector has taken a new dimension with the invention of many digital and robotic gadgets that aid in the execution of tasks. All human endeavors; including agriculture, construction, healthcare systems, manufacturing, commerce, and service providers, such as communication networks, financial institutions, food vendors, dry cleaning, and printing press, among others were over the past centuries analogous. There were so much waste and non-conformity to differentia standard. The unfathomable models became outmoded with the introduction of research and innovation (R&N) which subsequently made production systems such as automobiles, automated pharmaceuticals, financial systems, and production systems become automated in developed economies. In Africa and other developing economies, traditional methods that often make managers ineffective center around issues rather than solutions are gradually being eliminated.

The current waves of Innovative management practices with their associated impacts on corporate performance and plant capacity utilization came into play to reduce accumulative environmental, social, and economic uncertainty on business activities. It is believed that Businesses left behind in this explosive shift would lose competitive advantages in the global market. The presence of waste detectors; quality control systems; counterfeit machines, financial tech (Fintech); environmental protection mechanisms, and robotic services on firms' productivity cannot be overemphasized. At the same time, businesses must prioritize sustainability to reduce their environmental impact and meet consumer demands for eco-friendly products and practices. This can involve adopting more sustainable production methods, reducing waste and emissions, and sourcing materials from sustainable sources. However, these efforts can be costly, time-consuming, and may require significant changes to a company's operations.

A push for sustainable development by an entity is to, in addition to profit, add economic, social, and environmental values to the business. Through the emergence of digital platforms, business intelligence technologies (BIT), and modern management processes (MMP), it is assumed that business products would become repairable, reusable, biodegradable, durable, recyclable, and affordable with lower negative environmental impacts. Businesses must also consider the social impacts of their operations, including the well-being of their employees, the communities in which they operate, and the broader society. This can involve implementing fair labor practices, supporting local communities, and contributing to social causes. However, these efforts can also be difficult and costly to implement, particularly for small and medium-sized businesses. This study is carried out to evaluate the influence of modern manufacturing practices on business sustainability.

➤ *Objectives of the Study*

The major objective of this study is to establish the effects of innovative production practices (IPP) on business sustainability (BS) in the 21st century. The specific objectives are discussed below;

- To evaluate the impact of digital technology on business sustainability: This objective aims to assess how emerging technologies can enhance the efficiency and effectiveness of innovative production systems and promote business sustainability.
- To examine the influence of continuous improvement (CI) management on business sustainability. This objective aims to evaluate the role of kaizen management processes in achieving business goals.

➤ *Hypotheses of the Study*

The null hypotheses formulated in the course of this study are as presented below;

- There is no significant effect of digital technology on business sustainability: This objective aims to assess how emerging technologies can enhance the efficiency and effectiveness of innovative production systems and promote business sustainability.
- There is no significant impact of continuous improvement (CI) on business sustainability.

II. REVIEW OF RELATED LITERATURE

➤ *Conceptual Framework*

A harmonized effort must be desirable by an economy to nurture and implement innovative management practices. While industrialized nations and some businesses have successfully developed and implemented modern management arrangements. Developing economies like Africa and India are still groping from afar, trying to catch up with reality. However, a few organizations have seen the need to compete in the global market to achieve international competitive advantage, and have also made positive efforts towards integrating contemporary management practices into their

production systems. The following are the explanations of the essential concepts for the development of this study.

A management practice is referred to as a system in which an organization manages the interrelated parts of its enterprise to achieve its goals. These objectives can relate to several different areas, such as product or service quality, operating proficiency, workplace healthcare, safety, and environmental performance, among others (ISO, 2015). The benefits of an effective management system for an organization include:

- More efficient use of resources and improved financial performance;
- Improved capability to deliver consistent quality services and products;
- Increase value to customers and all other stakeholders;
- Strong supply chain management;
- Efficient workforce diversity;
- Efficient maintenance system; among others

Marcello, et al. (2022), view innovative manufacturing tools as all measures to promote innovation in organizations and to generate benefits. Florian (2016) lists categories of innovative management from the perspective of new products and services to penetrate new markets, better-quality products and services to stand out from the rivalry, improve internal processes to fortify the firm's operation from external threats, and the development of new business models to create additional sources of revenue.

Lee and Mwebaza, (2020) define Innovation as the upshot of a set of actions that apply skills, knowledge, and technological know-how to fulfill individual or collective requirements. UNCTAD (2020) observes that Innovation management requires efficient business processes directed toward increasing efficiency, control of tools and improvement prospects, providing aids for human health and the environment, and resulting to the proficient use of business resources that will generate social and economic returns. As opined by Dayneko, et al.,(2020), Innovative management is the basis for development, which requires reorganization to consolidate modernization that allows the development of goods, and services, methods, processes, and people in organizations. According to Bermudez and Lara (2011), viable innovation processes, oftentimes, are sporadic, chaotic, adaptive, as well as augmentable. Innovative management is the shaping of novel ideas and knowledge that allows the development of goods, and services, methods, processes, and people in organizations (Hernandez, Bernardo, and Cruz, 2018). As also described by Nelson and Winter (1977), innovative management involves determining and detailing the options of strategies for system enhancement. Innovation requires a connection of organizations that are into similar business activities such as importation, adjustment, and diffusion of modern technologies (Freeman, 1988).

Developing new projects may require stimulating yourself continuously and exploring new paths or methods. This type of entrepreneurial innovation can help professionals focus on gathering ideas from different places and discover enough data to build a seamless strategy to implement these ideas. Innovative free enterprise is the practice of creating new business ideas to generate profit, promoting the institutions, and accomplishing enterprise aims and objectives. Innovation helps an entity, individual, or group of entrepreneurs to upgrade, advance, or improve on a specific process, product, or service through new idea creation. Innovative entrepreneurs incorporate numerous stratagems to stun the tasks in their businesses. It may require industrialists to have a vibrant strategy and a vision to reveal something innovative to the company. Innovative capitalists are individuals who have the capability of producing, building, and passing innovative products to the market.

- *Digital Platforms as key innovation factors:*

Digital platforms have contributed immensely towards business growth, and environmental and social well-being for decades. Lapinska, et al., (2021); and Khalid (2020) describe these as the machines that run in the recreation of humanoid intelligence in technologies, machine learning, data mining sharing platforms, enterprise resource planning (ERP), etc. ERP is an enterprise-wide set of organizational tools used to accomplish day-to-day business activities such as bookkeeping, procurement, project management, human resource, inventory, supply chain, vendor risk management, manufacturing, maintenance, and enterprise performance management, employing proven business processes for decision making, etc (Wallace and Kremar, 2001; Negash,2004; Nofal, and Yusof, 2013).

According to Huang and Rust (2021), artificial intelligence (AI) is the use of computing tools to mimic human capacities including thinking, emotion, and performing physical or mechanical activities. Businesses can use AI machinery to save costs, issue more human resources, and finish routine work in marketable operations (Mikalef and Gupta, 2021).

In a scholarly work by Marcello, et al. (2022), economic, technological, competitive, organizational, and social factors are highlighted as key success factors for digital platform adoption in firms willing to innovate. In addition to this, business intelligence (BI) capabilities are filtering/transforming data, preparing and cleaning data, cloud BI, and visualizing data (Malekshah et al., 2022)). Emerging technologies, if abundantly integrated can aid a company in making better decisions, attaining operational efficiency, and easy access to critical information. These Inventions and production competitiveness influence research and development (R&D) (Lundyall, 2016).

- Continuous Improvement (CI) as a driver of business sustainability, is necessary for organizations today to maintain low alteration outlays, shorten exchanges, cut invention costs, and reduce waste to achieve attractiveness. This can be done through the application of the continuous improvement philosophy. Continuous improvement is an organization-wide process of focused and sustained incremental innovation” (Bessant and Caffyn 1997). CI is being advanced similarly to systems of quality improvement, and grasping behaviors of refining creativity by its continuous rationalizing (Bhuiyan and Baghel 2006). The advancement can only be achieved by inventiveness when innovations are combined with constant upgrading of the quality of production (Imai 1986). The impact of CI on advancing the value of goods and services cannot be overemphasized (Bessant, et al. 2001).

Business Sustainability: Business sustainability comes from sustainable development. In 1987, the United Nations coined the term sustainable development. In simpler terms, sustainable development means addressing the requirements of the present without sacrificing the capacity of future generations. (Dayneko, et al. (2020); McKinsey (2017); Linder, et al. (2003) preserving a balance between well-being, environmental protection (Lee, Mwebaza, 2020), and economic growth (Bansah, 2022). Businesses should not hurt the environment or society as a whole (Haanaes and Olync, 2022). To prevent short-term earnings from becoming long-term liabilities, businesses should keep an eye on the effects of their operations on the business environment (Alexandra, 2018).

The definitions above sound like warnings of the consequences of attempting corporate growth and trying to solve industrialization problems without considering the effects on social and economic values. Concepts such as eco-efficiency and green innovation in administrative philosophy direct all sectors of society to accept the obligations for sustainability and to apply data and strategies to create ecological progress. [Pansera, (2013); Grovemann, et al. (2019); Del, et al. (2016); Kanda (2018). At the same time, Beltramo, Mason, and Paul (2004) stress that the ability of a company to increase its knowledge through the external environment results from a variety of formal or informal relationships involving other companies, cross-firm collaboration (involving customers and suppliers), and the transfer of technology among firms, involving academic institutions or public sector labs.

➤ *Theoretical Framework*

Some theories that show the interconnection between technology and innovation in management are discussed below;

- Technological Innovation System (TIS) theory, according to Carlsson and Stankiewicz (1991), is a dynamic network of actors engaging in a particular economic/industrial area within a particular organizational facility and involving the dissemination and application of technology. According to Malerba (2002), a TIS is assumed to have the structural components of technology, a network of actors, supporting

institutions, and a demand side (Shabbak, 2019). According to Ortt and Kamp (2022), businesses concentrate on specific, substantially novel innovations that use a technology principle. Product performance, quality, and price as essential innovative qualities, particularly from a lower competitive alternatives business standpoint. Such an innovation is surrounded by a system made up of several technological elements.

- The product-process Concept: The notion of the product-process is also referred to as the concept of new product development. It includes every stage necessary to bring a product from conception to market availability. Rational product management (RPM), a more recent addition to the notion, is a unified approach to product creation that incorporates the use of software, strategic planning, engineering techniques, and managing technical resources. This strategy provides a foundation for iteratively strategizing (Kim, 2019).
- Resource mobilization and protection theory, which are essential for putting sustainability into practice, are processes that involve ongoing participation and dialogue to build trusting alliances (Cerda, 2016). They also ensure that business decisions are framed within the boundaries of the law and are adjusted and in line with the various sustainability parameters (Korhonen, et al., 2021).

➤ *Empirical Framework*

The United Nations Conference on Trade and Development (UNCTAD, 2015) proposed taking advantage of innovative management for sustainable development through transformative innovation policies (TIP) in which an extensive range of multidisciplinary professionals are involved in encouraging an inclusive and sustainable development agenda, therefore promoting global advancement in all sectors of human endeavor. Research by Chou, et al. (2005) and Agostine (2014) examined the influence of mixing digital platforms, (ERP) systems with business intelligence systems on decision-making performance. They argued that the integration of BI and ERP gives the possibility of integrating two digital technologies which increases organizational competitive advantages. According to Chou et al. (2005), ERP systems are transaction-based, meaning that their applications are made to process high volumes of business transactions quickly. BI enables dynamic enterprise data search, retrieval, analysis, and explanation of the demands of managerial decisions since it may produce friendly reporting (Nofal and Yusof, (2013). The fact that the article is more theoretical than experiential is one of its drawbacks.

A study by Jeremy (2021) focused on the impact of ICT on Italian education and whether implementation impacts students' performance and shows a positive correlation between computer performance and students' general performance. One of the aspects that have given rise to much enhancement in performance is the growth in productivity and usefulness in knowledge acquisition due to ICT execution in Italy's educational system.

In a broader study by Denicolai et al., (2021), Mikalef and Gupta (2020); and Huynh, et al. (2020), AI technology and its capability on business performance cannot be overemphasized. The existing literature dedicated to the study of the impact of AI on industries, such as banking and finance, production, robotic trading, logistics, marketing, coaching, and consumer relationship management (Chien et al., 2020; Chatterjee et al., 2021; Kim et al., 2021). Digital platforms can bring proficiency advantages, cost savings, continuous improvements in the production system, and customer service enhancements (Dwivedi, et al., 2021). The majority of management researchers studying technology-driven innovation have focused on issues like how artificial intelligence can support organizational processes (Frank et al., 2019), corporate models (Di Vaio et al., 2020), obstacles to implementing digital platforms in organizations (Desouza et al., 2020; Haefner et al., 2021), decision-making assessment (Kakatkar et al., 2020; Verganti et al., 2020). In a study by Piersiala and Trzcienlinski (2009) titled, "The methodology of continuous improvement process management in a manufacturing system", a structure of literature analysis for continuous improvement application showed a positive relationship between importance and practice for most objects, for both established CI and developing CI firms, although, the correlation was normally higher for developing firms for means such as promotion through core media advertisement, competition awards usage of ISO 9000, and complete creative maintenance in both developed and developing firms. Interestingly, there was a small and generally inconsequential correlation, for mature CI organizations, between the importance and usage of management support, supportive leadership, and face-to-face communication. Research by Hyland, et al. (2000) also divided companies into developing CI systems and mature CI. Dabhilkar and Bengtsson (2006) selected the most relevant CI devices used for manufacturing problem-solving setup, prescribed strategy arrangement, 5s, and training in problem-solving tools, among others.

III. RESEARCH METHOD

➤ *Research Design:*

This study is descriptive and quantitative research because primary data about the variables of interest were collected using the questionnaire with a quantitatively ordered scale and analyzed using quantitative statistical techniques. In addition, the study adopted the cross-sectional survey design to appreciate the role of innovative manufacturing systems on business sustainability. It allows the choice of demonstrative unit for the larger population through the sampling process, and collection of data from the population sample within a single frame of time (Hunger and Wheelen, 2018).

➤ *Research Population*

The target population of this research was the 200 full-time employees of Champion Breweries Plc, a manufacturing firm that produces public consumable goods in Akwa Ibom State, Nigeria. This targeted population was considered

appropriate for this study because of its proximity to the study area and the availability of infrastructural facilities and tools that encourage the growth of innovative enterprises. This provided a better opportunity to study the targeted population seamlessly without also compromising the required thoroughness of a scientific study.

➤ *Sample Size and Sampling Technique:*

The determination of tolerable sample size for this study was guided by Krejcie & Morgan’s (1970) sample size determination table (available in the appendix section of this paper). To avoid bias in sampling selection, the random sampling approach was adopted to select 132 respondents who were mainly the production unit staff, management staff, marketing unit, accounting, and the medical staff were administered the questionnaire. In terms of sample size adequacy, which also denotes its representativeness, Mugenda and Mugenda (2003) opined that a good population sample is between 45% and 50% of the total population. Accordingly, the sample size for this study was 50% of the population, therefore justifying its representativeness.

➤ *Data Collection Instrument:*

The primary data collection instrument used was developed by the researcher which is the structured, closed-ended questionnaire. The decision to utilize the questionnaire above other forms of scientific inquiries for this study was founded on its economy, standardization, and convenience (Christou, 2012). A thorough literature review was carried out and used to develop the initial questionnaire. This provided the basis for the design of the questionnaire tagged: “Survey of Innovative Manufacturing Systems and Business Sustainability in the 21st Century”. The questionnaire items were scored based on the 5-point Likert scale of 1 to 5 which characterizes strongly disagree, disagree, neutral, agree, and strongly agree. The structured questionnaire had three sections, namely: The demographic section with questions meant to collect information about the profile of respondents and the organization’s demographics, the innovative manufacturing practices section, and the firm’s sustainability section. A total of 21 questionnaire items were designed for this study’s data collection. The instrument had a cover letter, informing the respondents about the importance and aim of the study, assuring them of confidentiality of information and anonymity of participation, and also how their data would be utilized throughout the study. This was necessary to maintain the ethical standards of this research.

Table 1: Summary of Questionnaires Administered and Collected

Categories of Workers and Department	N0. Of Questionnaire		Percentage Retrieved (%)
	Served	Retrieved	
Management Team	8	6	75
Operation Unit	60	60	100
Technical Unit	16	16	100
Accounting unit staff	20	20	100
Marketing Dept	20	18	90
Health/laboratory unit	8	8	100
	132	128	96

Field survey data (2023)

➤ *Validity and Reliability of Instrument*

To ensure the consistency and reliability of the instruments, this study was subjected to content validation by some management researchers and a statistician. The administration of the instrument was done once and the scores obtained were used to establish the reliability coefficient, using a parametric test (multiple linear) regression. A Cronbach’s reliability test was conducted to check the internal reliability of the data. The reliability was found to be above α 0.55 thresholds. In the opinion of Nunnally and Bernstein (1994), a reliability threshold of 0.50 indicates that a research instrument is good and also confirms the internal reliability of the items used in the questionnaire.

➤ *Measurement of Variables*

The predictor variable (innovative manufacturing practices) was operationalized into two dimensions as follows; emerging technologies and digital platforms, and a continuous improvement model. These constructs are called predictors

because they are capable of causing a change in the behavior of the outcome variable. The dependent or outcome variable, business sustainability was likewise decomposed into Environment, socioeconomic variables, and governance but was held constant during data analysis. These variables are succinctly stated in the questionnaire.

➤ *Method of Data Analysis*

The research issues were addressed using the descriptive statistics for data tabulation and presentation. Data were analyzed using simple linear regression. The result from the study was used to measure the influence of innovative manufacturing systems on business sustainability using the various constructs as shown in the research objectives.

➤ *Empirical Specification of Model*

The empirical constructs of this study, “Innovative Production Practices and Business Sustainability” were presented mathematically as follows;

$$Y^* = f(X) \dots\dots\dots (1)$$

Where Y* is the dependent variable, and X is the independent variable.

Where Y is the dependent variable; a is the intercept, b is the regression coefficient, DI represents digital technologies and CI represents the continuous improvement model.

IV. DATA PRESENTATION

Data gathered from the field survey were presented and discussed here. The closed-ended, 5-point Linkert scale questionnaires were administered using Strongly Disagree (SD), Disagree (D), Neutral (N) Agree (A), and Strongly Agree (SA). The table below shows the summary of the respondents' reactions to the questionnaire.

This model was further deposed as shown below:

$$Y^* = f(DI, CI) \dots\dots\dots (2)$$

Using the linear regression formula, we have

$$Y^* = a + b_1DI + b_2CI + b + \dots e \dots\dots\dots (3)$$

Table 2: Effect of digital and emerging technologies on business sustainability

SN	ITEM	SD	D	N	A	SA
1	Sustainable practices ensure the longevity of your digital platforms	0	0	1 0.8	57 44.5	70 54.7
2	Digital TECH and data sharing will play significant roles in the future success of your business	0	0	0	51 39.8	77 60.2
3	Emerging technologies have helped your business reduce waste and improve resource efficiency	0	0	0	37 28.9	91 71.1
4	Emerging technologies have improved business social and ethical practices.	0	0	0	33 25.8	95 74.2

Source: Field Survey (2023)

Table 2. shows the responses used in assessing the influence of digital technologies (DI). When asked if sustainable practice ensures the long-term growth of the business, 54.7% of the respondents strongly agreed (SA), and 44.5% merely agreed. 0.8% remained neutral with the assertion. Regarding the question of how emerging technologies have helped businesses to reduce waste and improve resource efficiency, 91 respondents which represents

71.1% of the total respondents strongly agreed (SA) while 37 which means 28.9% of the respondents agree with the assessment. 81 respondents, 63.2% strongly agreed that ICT initiatives within our organization led to positive outcomes. 47 respondents 36.7% also to this assessment. 74.2% and 25.8% of the respondents agreed and strongly agreed that emerging technologies have improved business social and ethical practices.

Table 3: Influence of Continuous improvement system on business sustainability

SN	ITEMS	SD	D	N	A	SA
6	The continuous improvement (CI) system within our organization has led to positive outcomes	0	0	6 4.7	68 53.1	54 42.2
7	Your skills and abilities are utilized to contribute to the continuous improvement of our organization	0	3 2.3	8 6.3	81 63.2	36 28.1
8	CI initiatives within our organization are aligned with the overall strategic goals of the organization	2. 1.6	7 5.4	0	76 59.4	43 33.6
9	CI improves the efficiency and accuracy of our business processes	0	0	2 1.6	83 64.8	43 33.6
10	Our company is continuously improved and aligned through training and retraining, seminars, and programs that enliven the workers	0	0	3 2.0	83 65.0	42 33%

Source: Field Survey (2023)

Table 3 shows the total number of respondents who responded to the questions on continuous improvement (CI) and business sustainability. Regarding the question if CI has a positive influence on business sustainability, 68 (53.1%) and 54 (42.2%) agreed and strongly agreed that Continuous improvement (CI) systems within the organization have led to positive outcomes. 4.7% of the total respondents remained

neutral. When asked if employees' skills and abilities were utilized to contribute to the continuous improvement within the organization, 36 (28.1%) of the respondents strongly agreed while 63.2% agreed. 8 respondents, 6.3% neither agreed nor disagreed while 3 respondents (2.3%) disagreed. Inquiry if CI initiatives within the organization are aligned with the overall strategic goals of the organization, 43 respondents which

represent 33.6% of the total respondents strongly agreed while 76 (59.4%) respondents agreed whereas 1.6% and 5.4% of respondents strongly disagreed and disagreed respectively. The assessment on whether the company is continuously improved and aligned through training and retraining, seminars, and programs has 83 respondents which represent 65% of the total respondents that agreed while 42 (33%) strongly agreed. 2% (3 respondents were undecided.

V. DATA ANALYSIS AND INTERPRETATION OF RESULT

➤ *Test of Hypotheses*

H₀₁: There is no significant effect of digital and emerging technologies on business sustainability.

H₀₂: There is no significant impact of continuous improvement (CI) on business sustainability.

H₀₃: There is no significant influence of entrepreneurship and innovation ecosystems in facilitating the creation and diffusion of sustainable practices in businesses.

In testing these hypotheses, explanatory variables, digital and emerging technologies, and continuous improvement were

regressed to determine their effects on the response variable. The data and results of the findings are presented below:

➤ *The Results:*

To analyze the hypotheses, the researcher employed linear regression at a 95 percent level of interval. The model summary shows F statistics (3,128) = 5.440, Probability value = 0.001, R = 0.336, R² = 0.113 and adjusted R² = 0.92. The R-value of 0,336 shows there is a weak but positive relationship between the variables. The Adjusted R² of 0.92 shows that about 92% of the change in business sustainability is explained by the predictor variables (digital technologies (DG), and Continuous Improvement (CI) while 8 percent is captured by the error term. The Kolmogorov-Smirnov^a test of normality of above 0.05 threshold shows that the model is a good fit. Also, The Durbin-Watson statistic of 1.93 indicates that there is no evidence of autocorrelation in the regression line (See Model Summary in Appendix I). The collinearity statistics show the tolerance and value inflection factor (VIF) of 0.901, 0.884, 0.920, and 1.105, 1,154, and 1.080 respectively. These indicate that there are no multiple linearity issues in the model. Some statisticians suggest that if the VIF is less than 3.5, the model is correct.

Table 4: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	3.129	.441		7.087	.000	2.255	4.002		
1 DG	.17	.059	.242	2.904	.004	.054	.286	.901	1.105
CI	.098	.060	.135	1.613	.109	-.022	.217	.884	1.154

VI. DISCUSSION OF FINDINGS

The analysis in the coefficient table above shows that digital technology (DG) has a positive influence on business sustainability (BS). In the unstandardized coefficient, B = 0.170, t =2.90, P-value = 0.004. Since the calculated t-value exceeds the threshold value of 1.96, the null hypothesis that there is no substantial effect of digital and emerging technologies on business sustainability is rejected. More so, the probability value of 0.004 is less than the 0.05 level of significance, indicating that the result is significant. This shows that integrating digital technology into the firm’s productive system would increase the organization’s chance of gaining competitive advantages. This is in consonant with Agostine’s (2014) study that integrating digital technology will probably strengthen businesses by combining decision-making capability through utilizing analytical capability and data management capability. Also, Jeremy’s (2021) research indicates that the application of information and communication technology in Italian companies has resulted in to increase in productivity.

Sossa, et al. (2021), and Chou, et al. (2005) concluded that one of the variables that have influenced performance improvement is the proficiency in handling tasks through the application of digital technology.

However, hypothesis two which states that there is no significant effect of continuous improvement on business sustainability was accepted, where B = 0.98 and P-value = 0.11. The result here is not significant at a t-value of 1.61 and a p-value of 0.11 at a 0.05 level of significance. This indicates that there is no clear evidence that Continuous improvement (CI) influences business sustainability, BS. Concerning this, a study by Piersiala, and Trzcienlinski, (2009) also shows a low and insignificant connection between particularly for established CI companies and management support and direct communication with companies that have not matured in continuous improvement methodology.

VII. CONCLUSION

Modern production inventions and emerging management philosophies have played significant roles in business sustainable development for the past decades. The study has empirically established emerging technologies and digital platforms, such as enterprise resource planning, business intelligence tools, artificial intelligence, robotic manufacturing, etc. have a positive impact on the environmental, social, and governance ecosystem of the company. The main factor underlying this outcome in a manufacturing company like Champion Breweries plc is the extent of mechanization and technological progress. There is often a fact that there occurs a very close productive connection between the degree of capital per unit of labor factor and the level of digital technology in the manufacturing sector. The innovation ecosystem also plays a crucial role in business sustainable development. Because it represents an interacting group of actors that back novelty processes and create technologies and modernizations. It was identified that innovation in technology boosts an organization's productivity. It is established in the analysis of data that an adjusted R^2 of 0.92 shows that 92% of the change in business sustainability is explained by the innovativeness of the company which is a departure from the traditional manufacturing system. Innovation is the heart of business and companies that successfully integrate such into their production systems can among other things ignite the spirit of wealth creation and socio-economic development.

In conclusion, innovative manufacturing techniques improve societal well-being, lower risks to the environment, and increase the effectiveness of the factors of production. Through management innovation, a company can swiftly boost its productivity and profitability, thereby raising the standard of living for its employees and increasing shareholder wealth.

As evidenced in the test of hypotheses, the failure of continuous improvement to make a significant impact on company sustainability suggests that some manufacturing companies in the developing economy lack the strategic competency to implement continuous improvement methodology in their production systems. The use of numerous organizational resolutions to safeguard time for CI activities, such as pre-shift team discussions, creating time for training, lowering production haste to free up employees for CI, creating awareness, and communicating the CI system to the employees and management, has frequently resulted to strategic advantage for developed organizations. We, therefore, recommend that employees should be given the freedom to use their capacity for sharing ideas and data. Workers can develop their understanding of CI techniques by participating in programs of visits to other organizations, attending workshops and conferences, and receiving basic CI training.

➤ Contribution to Knowledge

The study has without misleading, to a great extent, contributed to the existing literature on modern technology and manufacturing performance in the 21st Century. A careful look at the previous study literature uncovered that there was a lacuna in knowledge about innovative production systems. Analyses of the innovativeness of production systems have been more theoretical than practical as shown in this study. This study has suggested some key manufacturing practices that industries in developing economies should adopt to boost productivity. The work has put forward recommendations for further studies to expand the frontiers of knowledge in innovative manufacturing and sustainable development.

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