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Technology Adoption, Monitoring and Evaluation and the Performance of Large Manufacturing Firms in Kenya: A Case of Kenpoly Manufacturers Limited

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Abstract—Large manufacturers in Kenya face rising operating costs and slow growth in output, which makes the way they use technology and track their results increasingly important. This study examined the effect of technology adoption and monitoring and evaluation (M&E) on the performance of large manufacturing firms in Kenya, using Kenpoly Manufacturers Limited as a case. It was anchored on the Technology Acceptance Model and the Dynamic Capabilities Theory. A descriptive research design was adopted, and a census was conducted of all 106 employees in the Corporate Strategy, Production and Finance departments of the firm. Data were collected through a structured five-point Likert scale questionnaire that had been pre-tested on 11 employees of Silafrica Plastics Kenya Limited, and 102 usable questionnaires were returned, a response rate of 96%. The data were analysed using frequencies, percentages, means and standard deviations in SPSS version 29. Respondents strongly agreed that technology had been adopted effectively (M = 4.78, SD = 0.382) and that M&E was well practised (M = 4.77, SD = 0.390), and they rated firm performance highly (M = 4.75, SD = 0.412). Faster production through automation (M = 4.95) and the early detection of performance gaps through regular tracking (M = 4.98) received the highest ratings, while the reduction of operational errors through automation (M = 4.48) and the contribution of tracking to task accountability (M = 4.58) received the lowest. The study concludes that technology adoption and M&E are well established at the firm and are associated with high productivity, profitability and efficiency, although automation has not removed all errors and tracking is not yet fully tied to individual responsibility. It recommends structured operator training, error-proofing of automated lines and the linking of performance tracking to individual targets and feedback.

***Index Terms*—Firm Performance, Kenya, Large Manufacturing Firms, Monitoring and Evaluation, Technology Adoption**

1. Introduction

Manufacturers worldwide compete in markets shaped by rapid technological change and rising customer expectations. Automation, digital platforms and data-driven systems now influence production speed, product quality and cost, and firms that integrate these technologies into their strategies respond more effectively to market shifts (Almehairbi et al., 2022). Technology alone is not enough, however; firms also need systems that show whether their investments and operations are producing the intended results. Monitoring and evaluation (M&E) provides this information by tracking activities, reporting progress and reviewing outcomes so that managers can take corrective action in good time (Arno & Mujahidin, 2024; Olwenyi et al., 2025).

In Kenya, manufacturing is a priority sector for industrialisation and employment, yet its share of gross domestic product fell from 7.3% in 2024 to 7.1% in 2025, and output grew by only about 2% (Kenya National Bureau of Statistics [KNBS], 2026). The uptake of advanced manufacturing technology among Kenyan firms remains uneven (Musebe, 2024), even though automation and process innovation have been linked to competitive advantage and better performance among local manufacturers (Nduati et al., 2026; Onguso et al., 2026). At the same time, evidence on M&E in Kenya comes mainly from retail firms and public projects rather than from manufacturers (Galgallo, 2024; Nyabuto & Musembi, 2024).

Technology adoption refers to the acquisition and integration of new tools, systems and innovations into the operations of a firm to raise productivity, efficiency and competitiveness (Almehairbi et al., 2022). In manufacturing, it includes automated production lines, digital record keeping and reporting, communication platforms and enterprise resource planning (ERP) systems (Wachira & Kyalo, 2024). M&E, on the other hand, is the systematic observation, measurement and assessment of activities to establish whether objectives are being achieved efficiently and effectively (Arno & Mujahidin, 2024). The two practices are complementary: technology generates and records operational data, while M&E turns that data into decisions (Agyapong et al., 2024).

Kenpoly Manufacturers Limited, established in Nairobi in 1977, is a large plastics manufacturer with more than 300 employees and a range of household, institutional and industrial products sold across East Africa (Kenpoly Manufacturers Limited, 2026). The firm has repeatedly upgraded its production technology since it began operations with a single

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injection moulding machine, which makes it a suitable case for examining how technology adoption and M&E relate to the performance of a large Kenyan manufacturer.

A. Statement of the Problem

Large plastics manufacturers depend on machinery that must run efficiently and on input costs that must be controlled if prices are to remain competitive. Slow adoption of technology and weak tracking of performance can therefore quickly erode output and profitability (Musebe, 2024; Rambeka & Odollo, 2023). Evidence on these practices in Kenyan manufacturing is limited. Musebe (2024) found that design and planning technologies improved the performance of small and medium manufacturers, but that manufacturing technologies had no significant effect once these were accounted for ($p = .698$), while Wachira and Kyalo (2024) examined ERP systems alone. Studies of M&E in Kenya have focused on supermarkets (Galgallo, 2024; Godana et al., 2025) and road projects (Njeru & Kirui, 2022; Nyabuto & Musembi, 2024). Few studies have examined technology adoption and M&E together within a single large manufacturer, which is the gap this study addressed.

B. Objectives of the Study

The general objective was to establish the effect of technology adoption and M&E on the performance of large manufacturing firms in Kenya, with reference to Kenpoly Manufacturers Limited. The specific objectives were:

i. To find out the effect of technology adoption on the performance of Kenpoly Manufacturers Limited.
ii. To assess the effect of monitoring and evaluation on the performance of Kenpoly Manufacturers Limited.

2. Literature Review

A. Theoretical Review

1) Technology Acceptance Model

The Technology Acceptance Model (TAM) was proposed by Davis (1989) to explain why people accept or reject new technology. It identifies perceived usefulness and perceived ease of use as the main determinants of acceptance and use (Davis, 1989; Mustafa & Garcia, 2021). Later work extended the model with social influence and facilitating conditions such as training and technical support, culminating in the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003). Critics argue that the original model gives little attention to organisational and cultural influences (Natasia et al., 2022). In this study, TAM explains how employees' acceptance of automation, digital tools, digital platforms and the ERP system relates to efficiency and performance, and why training and support matter for realising the benefits of technology.

2) Dynamic Capabilities Theory

The Dynamic Capabilities Theory was developed by Teece et al. (1997). It holds that, in changing environments, sustained success depends on the ability of a firm to integrate, build and reconfigure its competences rather than on the resources it holds at any point in time (Teece, 2022). The theory identifies three processes: sensing opportunities and threats, seizing them through investment decisions, and reconfiguring resources as conditions change (Land et al., 2022; Teece, 2007). In manufacturing, these processes are visible in the way management reviews performance data, approves new technology and reorganises production (Ostadi et al., 2024). The theory links M&E, which supplies information on changing conditions, and continuous technology upgrading to the capacity of Kenpoly Manufacturers Limited to sustain its performance.

B. Empirical Review

1) Technology Adoption and Performance

In the United Arab Emirates, Almehairbi et al. (2022) analysed 330 responses using structural equation modelling and found that technology adoption significantly improved manufacturing performance ($\beta = 0.171$, $p = .001$), while employee training had an even stronger effect ($\beta = 0.396$, $p < .001$). In Lagos, Nigeria, Durowoju (2017) found that technological change explained 56.6% of the variation in the success of small and medium enterprises, and Umar et al. (2026) found that digital infrastructure ($\beta = .176$) and business model innovation ($\beta = .372$) significantly improved the performance of manufacturers in Sokoto State.

In Kenya, Wachira and Kyalo (2024) found that management support ($\beta = .520$), user satisfaction ($\beta = .326$), systems infrastructure ($\beta = .132$) and data security ($\beta = .091$) in ERP adoption explained 92.6% of the variance in the performance of manufacturers in Nairobi. Onguso et al. (2026) found that automation significantly increased the likelihood of competitive advantage among makers of building accessories ($\beta = 1.470$, $p = .012$), with larger firms benefiting more. Nduati et al. (2026) reported that process innovation explained 56.5% of the variance in the performance of large manufacturers ($r = .752$), and Monanka and Juma (2025) found that technological innovation had the strongest effect on the performance of state-owned sugar processors ($\beta = 0.412$). Mboga et al. (2023) similarly linked technological innovation capability to the performance of manufacturers in Nairobi. Musebe (2024), however, found that not all technologies yield benefits, which underlines the need to examine the specific technologies a firm uses.

2) Monitoring and Evaluation and Performance

In Ghana, Agyapong et al. (2024) surveyed 423 owner-managers and found that monitoring significantly improved enterprise growth ($\beta = .322$), resilience ($\beta = .307$) and sustainability ($\beta = .310$), while evaluation had stronger effects on growth ($\beta = .405$) and sustainability ($\beta = .471$). In Uganda, Olwenyi et al. (2025) found that M&E assessment had the largest effect on the performance of education projects ($\beta = .776$). Among manufacturing firms in Nigeria, Okoli et al. (2023) found that feedback on performance, a core element of M&E, explained 58.1% of the variation in employee outcomes ($\beta = 0.76$).

In Kenya, Galgallo (2024) studied 204 supermarket managers and found that feedback ($\beta = 1.52$), responsiveness ($\beta = 0.623$), monitoring ($\beta = 0.401$) and evaluation ($\beta = 0.317$)

significantly improved performance. Drawing on the same population, Godana et al. (2025) found that strategic feedback had a strong correlation with performance (r = .836) and that feedback and responsiveness together explained 72.9% of its variance. Nyabuto and Musembi (2024) found that M&E planning (β = .328) and stakeholder involvement (β = .339) improved the performance of urban road projects, while Njeru and Kirui (2022) linked performance reviews and M&E funding to the results of highway projects (R = .813). Within manufacturing, Rambeka and Odollo (2023) found that strategy evaluation and monitoring improved the performance of family-owned firms, and Cherono and Njeru (2024) found that strategic control and evaluation improved the performance of small and medium enterprises. Little of this evidence, however, comes from large Kenyan manufacturers.

C. Conceptual Framework

Figure 1 shows the hypothesised relationship between the independent and dependent variables. Technology adoption is expected to raise the speed and accuracy of operations and the flow of information, while M&E is expected to detect performance gaps early and support corrective action, both of which should improve productivity, output, profitability and efficiency.

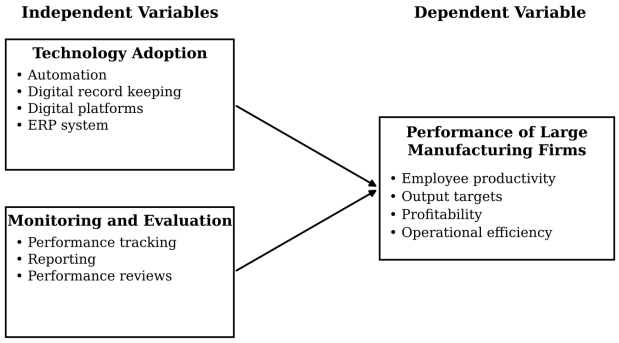


Fig. 1. Conceptual framework

3. Methodology

A. Research Design, Population and Sampling

A descriptive research design was used because it allows the characteristics of a population to be described as they are, using standardised data from a structured instrument (Creswell & Creswell, 2018; Saunders et al., 2019). The study targeted 106 employees of Kenpoly Manufacturers Limited drawn from three departments closely involved in the use of technology and the review of results: Corporate Strategy (40), Production (38) and Finance (28). Given the small size of the population and its location in one organisation, all 106 employees were included in a census, which eliminated sampling error (Kothari & Garg, 2019).

B. Research Instrument, Validity and Reliability

A structured questionnaire was used to collect primary data. Technology adoption was measured with five statements on automation, digital record keeping and reporting, digital platforms and the ERP system. M&E was measured with five statements on performance tracking, reporting and performance reviews. Performance was measured with five statements on employee productivity, output targets, profitability and operational efficiency. Responses were captured on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The data reported here form part of a wider MBA study whose instrument also measured strategic goal setting and resource allocation; those variables are not analysed in this article.

The instrument was pre-tested on 11 employees of Silafrica Plastics Kenya Limited, a plastics manufacturer with comparable processes, which is about 10% of the target population (Mugenda & Mugenda, 2019). The pilot respondents were excluded from the main study, and their feedback was used to refine the wording and order of the items. Content validity was ensured by deriving the items from the objectives and the literature, and face validity was confirmed through supervisor review. Reliability was assessed with Cronbach's alpha, using 0.70 as the minimum acceptable coefficient (Sürücü & Maslakci, 2020).

C. Data Collection and Analysis

Questionnaires were administered at the workplace of the respondents, with follow-up reminders to improve the response rate (Kothari & Garg, 2019). The completed questionnaires were checked, coded and analysed in SPSS version 29 (IBM Corp., 2022) using frequencies, percentages, means and standard deviations, and the results were presented in tables. Mean scores were interpreted as follows: 1.00–1.80 strongly disagree, 1.81–2.60 disagree, 2.61–3.40 neutral, 3.41–4.20 agree and 4.21–5.00 strongly agree.

4. Results and Discussion

A. Response Rate and Profile of Respondents

Of the 106 questionnaires distributed, 102 were completed and returned, a response rate of 96%, which exceeds the 70% threshold that Mugenda and Mugenda (2019) consider very good and is higher than the 90% reported by Nduati et al. (2026) among large Kenyan manufacturers. Table 1 summarises the profile of the respondents.

Table 1
Profile of respondents (n = 102)

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	52	51
	Female	50	49
Age	21–30 years	16	16
	31–40 years	44	43
	41–50 years	34	33
	51 years and above	8	8
Highest education	Diploma	27	26
	Bachelor's degree	57	56
	Master's degree	17	17
	No response	1	1
Work experience	Below 2 years	13	13
	3–5 years	27	26
	6–9 years	39	38
	10 years and above	23	23

Source: Field Data (2026)

Table 1 shows a balanced gender distribution (51% male, 49% female). About three quarters of the respondents (76%) were aged 31–50 years, 73% held a bachelor's degree or higher, and 61% had served in the firm for at least six years. The respondents were therefore familiar with the systems and procedures of the firm and well placed to assess its technology and M&E practices.

B. Technology Adoption and Performance

Table 2 shows that technology adoption had a composite mean of 4.78 (average SD = 0.382), which lies in the strong agreement band and was the highest of the practices measured in the wider study. The low average standard deviation points to broad consensus. Respondents most strongly agreed that automated systems had made production faster (M = 4.95, SD = 0.217) and that the ERP system had improved coordination and resource planning (M = 4.88, SD = 0.324). They also strongly agreed that digital platforms had improved communication across departments (M = 4.80) and that digital tools had made record keeping and reporting more efficient (M = 4.77). The reduction of errors in daily operations through automation received the lowest rating (M = 4.48, SD = 0.502). Automation has therefore accelerated production but has not removed all operational errors.

These results agree with Almehairbi et al. (2022), Durowoju (2017) and Umar et al. (2026), who found that technology adoption and digital systems improve the performance of manufacturers. They are also consistent with Kenyan evidence that automation, process innovation and technological innovation are associated with competitive advantage and performance (Monanka & Juma, 2025; Nduati et al., 2026; Onguso et al., 2026). The strong rating of the ERP system mirrors Wachira and Kyalo (2024), who found that ERP adoption explained 92.6% of the variance in the performance of Nairobi manufacturers. In contrast to Musebe (2024), who found no significant effect of manufacturing technologies among small and medium enterprises, respondents at Kenpoly strongly agreed that production automation had improved speed, suggesting that a large firm with established processes captures clearer benefits from production technology. The lower score on error reduction is consistent with the finding of Almehairbi et al. (2022) that training had a stronger effect on performance than technology itself. In terms of TAM, employees clearly regard the technologies as useful (Davis, 1989), while the extended model suggests that facilitating conditions such as training could help to close the remaining gap on errors (Venkatesh et al., 2003).

C. Monitoring and Evaluation and Performance

Table 3 shows that M&E had a composite mean of 4.77 (average SD = 0.390), also within the strong agreement band. The view that regular tracking helps to identify performance gaps early received the highest rating (M = 4.98, SD = 0.139), with near-unanimous agreement. Respondents also strongly agreed that timely reporting supports better management decisions (M = 4.77), that regular reviews enhance organisational performance (M = 4.77) and that clear reports improve communication on progress (M = 4.75). The lowest rating was for the contribution of continuous tracking to task accountability (M = 4.58, SD = 0.496). M&E at the firm is therefore effective at detecting gaps but less effective at assigning responsibility for closing them.

The findings agree with Galgallo (2024) and Agyapong et al. (2024), who found that monitoring and evaluation significantly improved the performance of Kenyan supermarkets and Ghanaian enterprises respectively. The strong agreement on timely reporting is consistent with Godana et al. (2025), who identified feedback as the strongest element of strategic control, and the strong agreement on regular reviews supports Njeru and Kirui (2022). The results also agree with Rambeka and Odollo (2023) and Cherono and Njeru (2024), who linked evaluation and control to better performance among Kenyan firms. The weaker score on accountability is consistent with Okoli et al. (2023), whose finding that individual feedback strongly shapes employee outcomes suggests that tying tracking results to individual feedback could strengthen accountability. The results support the Dynamic Capabilities Theory, since regular tracking and reporting give management the information needed to sense problems early and reconfigure operations (Teece, 2007).

Table 2
Descriptive statistics on technology adoption

S.No.	Statement	Mean	Std. Dev.
1	Automated systems have improved the speed of production processes	4.95	0.217
2	Automation has reduced errors in daily operations	4.48	0.502
3	Digital tools have made record-keeping and reporting more efficient	4.77	0.420
4	The use of digital platforms has improved communication across departments	4.80	0.446
5	The ERP system has enhanced coordination and resource planning in the company	4.88	0.324
	Composite mean / average standard deviation	4.78	0.382

Source: Field Data (2026)

Table 2
Descriptive statistics on monitoring and evaluation

S.No.	Statement	Mean	Std. Dev.
1	Regular tracking helps identify performance gaps early	4.98	0.139
2	Continuous tracking improves task accountability	4.58	0.496
3	Timely reporting supports better management decisions	4.77	0.465
4	Clear reports improve communication on performance progress	4.75	0.432
5	Regular reviews enhance overall organizational performance	4.77	0.420
	Composite mean / average standard deviation	4.77	0.390

Source: Field Data (2026)

Table 4
Descriptive statistics on firm performance

S.No.	Statement	Mean	Std. Dev.
1	Employee productivity has improved over time	4.94	0.236
2	Output levels meet set performance targets	4.56	0.499
3	The company consistently generates sufficient profits	4.70	0.462
4	Profit levels reflect effective resource use	4.79	0.406
5	Operations run efficiently with minimal waste	4.75	0.455
	Composite mean / average standard deviation	4.75	0.412

Source: Field Data (2026)

D. Performance of the Firm

Table 4 shows that firm performance was rated highly (M = 4.75, average SD = 0.412). The improvement in employee productivity over time received the highest rating (M = 4.94, SD = 0.236), and respondents strongly agreed that operations run efficiently with minimal waste (M = 4.75). The attainment of output targets was rated lowest (M = 4.56, SD = 0.499), indicating that planned volumes are not always fully achieved. The strong ratings of productivity and efficiency are consistent with the high ratings of technology adoption and M&E, a pattern in line with Nduati et al. (2026) and Wachira and Kyalo (2024). Since the analysis was descriptive, the results show an association between the practices and performance rather than a measured causal effect.

5. Conclusion

The study concludes that technology adoption and M&E are well established at Kenpoly Manufacturers Limited and are associated with high productivity, profitability and operational efficiency. Technology adoption is the stronger of the two: automation has made production faster, the ERP system has improved coordination and planning, and digital tools and platforms have improved record keeping and communication, although automation has not eliminated operational errors. M&E enables the firm to detect performance gaps early and to make informed decisions through timely reporting and regular reviews, but tracking is not yet fully linked to individual accountability. The findings support the Technology Acceptance Model, in that employees embrace technologies they find useful, and the Dynamic Capabilities Theory, in that monitoring supports the ability of the firm to adjust its operations. The conclusions rest on one firm and on descriptive statistics and should be generalised with caution.

6. Recommendations

First, the Production and ICT functions of Kenpoly Manufacturers Limited should introduce regular hands-on training for machine operators and system users, add error-detection and quality-control features to automated lines, and extend the use of the ERP system and digital reporting tools across departments. Error rates, downtime and rework should be recorded monthly to show whether these measures are working.

Second, management should link performance tracking to individual and departmental targets, give employees regular feedback on their results and ensure that review findings are acted on. Each review report should name the person responsible for every corrective action and the date by which it should be completed.

Third, government agencies responsible for industrialisation, working with the Kenya Association of Manufacturers, should encourage investment in automation and support training in performance monitoring to raise productivity in the sector (KNBS, 2026). Future research should apply correlation and regression analysis across several manufacturers and combine employee perceptions with objective measures such as production records and error rates.

7. Ethical Considerations

The study involved human participants. Ethical approval was obtained in the form of a research permit from the National Commission for Science, Technology and Innovation (NACOSTI) and an introductory letter from the Management University of Africa, and permission was granted by the management of Kenpoly Manufacturers Limited. Participation was voluntary and based on informed consent, respondents could withdraw at any time, no names or staff numbers were collected, and all responses were treated confidentially and reported in aggregate.

Conflict of Interest

The authors declare that they have no conflict of interest.

Data Availability Statement

The data are not publicly available because respondents were assured of confidentiality. Anonymised data may be obtained from the corresponding author on reasonable request.

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