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(JEPM) **Influence of Big Data Analytics on Performance of Donor
Funded Health Projects in Kajiado County**



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Influence of Big Data Analytics on Performance of Donor Funded Health Projects in Kajiado County

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ABSTRACT

Purpose: This study examined the influence of Big Data Analytics on the performance of Donor-funded health projects in Kajiado county. The specific objectives of the study were; to examine the influence of real-time analytics and data-driven decision-making on the performance of donor-funded health projects in Kajiado County, Kenya.

Methodology: The study targeted a population of 220 technical personnel drawn from donor-funded health projects in Kajiado County, from which a sample of 142 respondents was selected. Data for the study was collected using structured questionnaires and analyzed using descriptive statistics, correlation analysis, and multiple linear regression analysis. The data analysis was aided by SPSS software with the final findings presented in tables, charts and graphs.

Findings: The study established that real-time analytics and data-driven decision-making each had a positive and statistically significant relationship with project performance. Correlation analysis showed that real-time analytics ($r = 0.722$, $p < 0.01$) and data-driven decision-making ($r = 0.783$, $p < 0.01$) were strongly associated with the performance of donor-funded health projects in Kajiado County. Multiple regression analysis further confirmed that both variables exerted significant positive effects on project performance.

Unique Contribution to Theory, Practice and Policy: The study offers an empirical support for the position that organizations can improve their ability to adapt to changing project conditions through timely access to information. The study also offers practical guidance to project managers and programme officers to integrate analytics in planning, monitoring, evaluation, resource use and decision making during project implementation. At policy level, findings point to the need for stronger digital monitoring systems, better data management and the use of data evidence in reporting and managing donor funded health programmes.

Keywords: *Real-Time Analytics, Data-Driven Decision-Making, Big Data Analytics, Donor-Funded Health Projects, Project Performance*

JEL Codes: *M15, O33, I18, O22*

INTRODUCTION

Donor-funded health projects are central to improving healthcare delivery, particularly in developing countries where they support interventions in maternal and child health, HIV/AIDS, tuberculosis, nutrition, immunization and emergency health response (Smith, 2018; Johnson & Williams, 2020). These projects often operate in complex environments characterized by changing donor priorities, financial constraints and increasing demands for accountability, making effective project management essential for achieving sustainable health outcomes (Muller, 2019; Nguyen, 2021).

The widespread adoption of digital technologies has changed how donor-funded health projects collect, manage and use information. Electronic medical records, health management information systems, mobile applications and project monitoring platforms now generate large volumes of operational data that can support planning, implementation and performance monitoring when analyzed effectively (McAfee & Brynjolfsson, 2012; Waller & Fawcett, 2013). At the same time, project managers require reliable information that can help identify implementation challenges early and support timely interventions, particularly in dynamic project environments (Kwak & Ibbs, 2019; Taticchi et al., 2021).

Traditional monitoring approaches that rely largely on historical reports and expert judgement are often inadequate in rapidly changing health programmes (Aven, 2016; Rojas & Chinchilla, 2021). Big Data Analytics addresses this limitation by applying advanced analytical techniques to transform large and complex datasets into information that supports project implementation and organizational learning (Chen, Chiang, & Storey, 2012; Ghasemaghaei et al., 2021). Studies have shown that analytics capabilities improve forecasting, strengthen resource allocation and support early identification of implementation risks, thereby enhancing overall project performance (Provost & Fawcett, 2013; Dubey et al., 2020).

This study focused on real-time analytics and data-driven decision-making, two capabilities that enable organizations to make better use of project information. Real-time analytics provides immediate visibility into project activities, enabling managers to monitor implementation continuously and respond promptly to emerging issues. Data-driven decision-making complements this capability by ensuring that planning and managerial decisions are guided by objective evidence rather than intuition, thereby improving accountability and resource utilization (Wamba et al., 2015; Gunasekaran et al., 2021; Kiron, Prentice, & Ferguson, 2014; Mikalef et al., 2020).

Globally, development agencies and humanitarian organizations have integrated analytics into programme implementation to strengthen project performance. Digital dashboards, geographic information systems, mobile health technologies and real-time communication platforms are increasingly used to improve disease surveillance, monitor programme implementation and

support timely decision-making (Obaid & Abu-Naser, 2023; El Khatib et al., 2023; Dicuonzo et al., 2019). Organizations such as the International Federation of Red Cross and Red Crescent Societies (IFRC) and Médecins Sans Frontières (MSF) continue to use data analytics to improve emergency response, logistics management and programme monitoring (Greenwood et al., 2017; IFRC, 2020; MSF, 2019).

However, many organizations experience challenges in adopting and utilizing analytics effectively. Limited technical expertise, inadequate digital infrastructure, financial constraints and resistance to technological change continue to hinder the effective use of analytics in project management (Hossain et al., 2021; Sweeney et al., 2021). Consequently, organizations that successfully integrate analytics into project management are more likely to improve efficiency, transparency and donor accountability (Kiron et al., 2014; Ghasemaghaei et al., 2021).

In sub-Saharan Africa, the use of Big Data Analytics in donor-funded health projects remains relatively limited. Many organizations still rely on manual reporting systems and conventional monitoring approaches, reducing their ability to identify implementation challenges in a timely manner (Omwoyo & Kibui, 2018). In Kenya, although investments in digital health systems have increased, many donor-funded projects continue to face challenges related to limited analytics skills, fragmented information systems and inadequate technological infrastructure (Mburu et al., 2021; Omwoyo, 2019). Nevertheless, expanding ICT infrastructure and growing access to digital health technologies provide opportunities to strengthen analytics-driven project management (Kamau & Wambua, 2022; Taticchi et al., 2021; Rojas & Chinchilla, 2021).

Kajiado County presents an important setting for examining these issues because several donor-funded health programmes operate within the county, generating substantial operational and service delivery data while addressing diverse community health needs. However, empirical evidence on how real-time analytics and data-driven decision-making influence the performance of donor-funded health projects in the county remains limited.

Statement of the Problem

According to the Ministry of Health (2023), a considerable number of donor-funded health projects in Kenya continue to experience implementation challenges, resulting in failure to achieve planned health outcomes, comply fully with donor requirements, and deliver services within approved budgets. Similar trends have been reported globally, where between 30% and 45% of donor-funded health interventions fail to achieve their intended objectives due to delays in decision-making, ineffective monitoring systems, and inadequate use of project information (Project Management Institute [PMI], 2022).

Even with increased investment in digital health information systems, many donor-funded health projects in Kenya continue to rely on delayed reporting mechanisms and fragmented information systems that provide limited visibility into ongoing project activities (Omwoyo & Kibui, 2018).

Project managers often make operational decisions using outdated information, limiting their ability to respond promptly to implementation challenges. Real-time analytics has the potential to address this challenge by providing immediate access to project information, supporting continuous monitoring, and enabling timely corrective action during project implementation (Obaid & Abu-Naser, 2023; Dicuonzo et al., 2019). Similarly, data-driven decision-making enables organizations to use analytical evidence generated from project data to guide planning, resource allocation, and performance monitoring, thereby improving accountability and project effectiveness (Provost & Fawcett, 2013; Ghasemaghaei et al., 2021). However, these analytical capabilities remain underutilized in many donor-funded health projects despite the increasing availability of digital health data (ICT Authority, 2022; Wang & Nyambura, 2019).

Existing studies reveal important empirical and contextual gaps. Most research on analytics has concentrated on manufacturing, banking, logistics, and other commercial sectors, with relatively few studies examining the role of real-time analytics and data-driven decision-making in donor-funded health projects within sub-Saharan Africa (Bryant et al., 2020; Lee et al., 2019). In addition, previous studies have largely examined Big Data Analytics as a broad technological capability, giving limited attention to how timely access to project information and evidence-based managerial decisions influence project performance in resource-constrained health programmes (Kamau & Wambua, 2022; Mburu et al., 2021; Williams & Rose, 2021).

This study therefore sought to address these gaps by examining how real-time analytics and data-driven decision-making influence the performance of donor-funded health projects in Kajiado County, Kenya.

Objectives of the Study

The study was guided by the following objectives:

- i) To determine the influence of real-time analytics on the performance of donor-funded health projects in Kajiado County, Kenya.
- ii) To examine the influence of data-driven decision-making on the performance of donor-funded health projects in Kajiado County, Kenya.

THEORETICAL REVIEW

Dynamic Capability Theory

The Dynamic Capabilities Theory, advanced by Teece, Pisano, and Shuen (1997), extends the RBV by emphasizing an organization's ability to integrate, build, and reconfigure its internal and external competences in response to rapidly changing environments. The theory identifies three key components sensing, seizing, and transforming which collectively determine how firms sustain competitive advantage amid uncertainty (Teece, 2007).

This theory underpins the variable Real-Time Data Analytics, which reflects an organization's ability to sense and respond to risks as they arise during project execution. Real-time analytics provides continuous monitoring and rapid feedback loops that enhance responsiveness and adaptability (Hazen et al., 2018; Kiron et al., 2014). Through these capabilities, organizations can detect anomalies, adjust decisions instantly, and reduce the impact of unforeseen events (Teece, Peteraf, & Leih, 2016; Wamba et al., 2020). Thus, real-time analytics serves as a dynamic capability that enables firms to maintain agility and resilience in managing project risks in volatile environments.

Rational Decision Making Theory

The Rational Decision-Making Theory, attributed to Simon (1979), posits that effective decision-making follows a systematic process involving problem identification, data collection, evaluation of alternatives, and selection of the optimal solution. The theory assumes that decision-makers act rationally when they rely on empirical data, logical reasoning, and evidence-based analysis rather than intuition or biases (Bazerman & Moore, 2013).

This theory anchors the variable Data-Driven Decision-Making (DDDM), which emphasizes the use of analytics outputs to guide managerial and operational decisions. By integrating insights from data analytics into project management, organizations enhance the quality, consistency, and transparency of decisions (Provost & Fawcett, 2013; Brynjolfsson & McElheran, 2016). Recent studies show that data-driven organizations outperform their peers in terms of efficiency and risk mitigation, as decisions become less subjective and more evidence-oriented (Sharma et al., 2022; Wamba et al., 2020).

Conceptual Framework

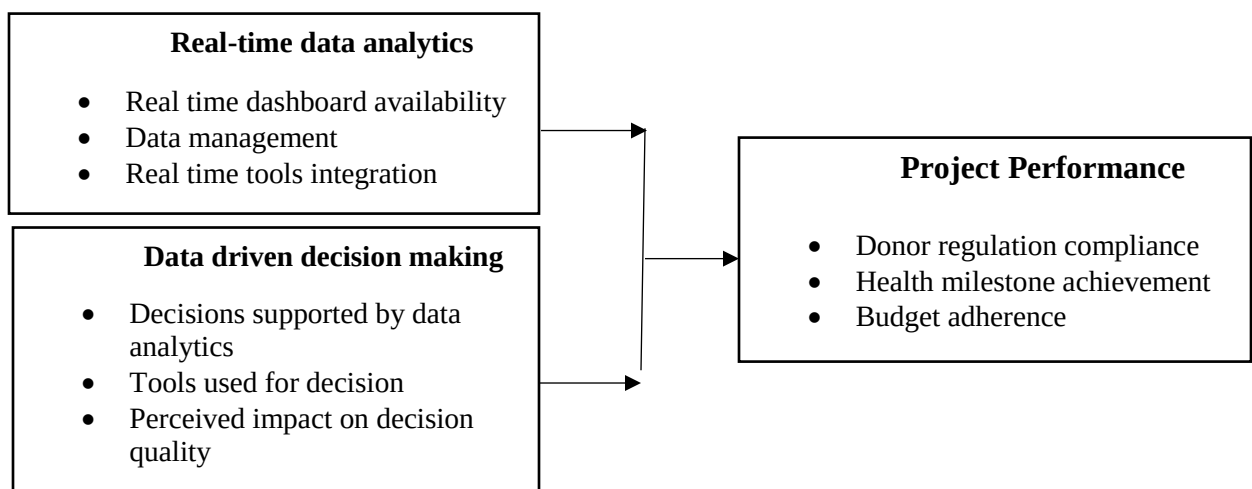


Figure 1: Conceptual Framework

Empirical Review

Real-time Analytics and Performance of Donor Funded Health Projects

Adebayo and Oladipo (2022) examined real-time analytics in Nigeria's immunization programs under donor-funded projects. The study adopted a cross-sectional design targeting 12 projects managed by NGOs and local health authorities. Structured questionnaires were administered to project coordinators and health workers, and data were analyzed using correlation and regression analysis. The study reported that real-time data monitoring facilitated faster reporting, early detection of vaccination gaps, and efficient allocation of vaccines, which enhanced project outcomes. Nevertheless, the study was restricted to immunization projects, limiting applicability to broader health interventions.

Kamau and Wanjiru (2023) investigated the influence of real-time analytics on HIV/AIDS donor-funded projects in Nairobi County. The study used a cross-sectional survey design targeting 10 NGO-managed projects, with questionnaires administered to project managers and M&E officers. Analysis was conducted using regression techniques. Findings showed that real-time data systems improved patient tracking, stock management, and timely intervention delivery, leading to higher project performance. The study's limitation was its focus on HIV/AIDS projects, leaving out other health areas funded by donors.

Mutiso and Wekesa (2024) studied real-time analytics in WASH-related health interventions in Kajiado County. A mixed-methods approach was used targeting 8 donor-funded health projects, with surveys, interviews, and program reports as data sources. Regression and thematic analysis indicated that real-time monitoring of water quality and disease outbreaks improved intervention timeliness, coverage, and resource optimization, enhancing project performance. The study, however, was geographically limited to Kajiado County, affecting generalizability to other counties with different socio-economic conditions.

Nyongesa and Kimani (2023) explored real-time analytics in immunization and public health outreach programs in Kenya. The study adopted a longitudinal design covering 10 donor-funded projects across Nairobi and Kiambu counties. Data were collected using structured questionnaires and operational records, analyzed using regression and correlation techniques. Results showed that real-time analytics improved reporting efficiency, early detection of service gaps, and rapid corrective measures, thereby enhancing project outcomes. The study's limitation was its narrow focus on immunization programs, not encompassing other health project types.

Data-Driven Decision Making and Performance of Donor Funded Health Projects

Nwankwo, Chukwu, and Eze (2022) investigated the influence of data-driven decision-making on HIV/AIDS project outcomes in Nigeria. The study adopted a mixed-methods design targeting 10 donor-funded HIV/AIDS projects. Data were collected via structured questionnaires, interviews, and program reports and analyzed using multiple regression. The findings demonstrated that

DDDM positively influenced resource allocation, adherence to project timelines, and delivery of services. However, the study's scope was limited to HIV/AIDS projects, making it less applicable to broader health project portfolios.

Mutiso, Wanjiru, and Mwangi (2023) studied DDDM in donor-funded health projects in Nairobi County, Kenya. A cross-sectional design targeted 12 NGO-managed projects, with questionnaires administered to project managers and M&E officers. Data were analyzed using correlation and regression analysis. The study found that data-informed decisions improved efficiency in service delivery, reduced resource wastage, and enhanced timely intervention in community health programs. The limitation of this study was its geographic concentration in Nairobi County, restricting generalization to other counties with different operational contexts.

Kamau and Nyaga (2022) investigated the effect of DDDM on maternal and child health projects funded by donors in Kisumu County, Kenya. The study employed a mixed-methods design targeting 8 donor-funded projects, with data collected through surveys, interviews, and document reviews. Analysis using regression and thematic coding revealed that DDDM facilitated effective targeting of beneficiaries, improved reporting accuracy, and enhanced project outcomes. Nonetheless, the study was limited to maternal and child health and did not consider other health sectors such as WASH or nutrition programs.

Munyugi and Nteere (2024) explored the adoption of data-driven decision-making in WASH-related health initiatives in Isiolo County. The study utilized a correlational design with a sample of 10 donor-funded projects, collecting data from project managers, field officers, and M&E personnel via questionnaires and program records. Regression analysis showed that projects that applied systematic DDDM approaches achieved higher operational efficiency, better resource management, and more reliable outcomes. The limitation was its focus on WASH projects, reducing its generalizability to other donor-funded health project types.

METHODOLOGY

This study adopted a descriptive survey design to examine the influence of Big Data Analytics capabilities on the performance of donor-funded health projects in Kajiado County, Kenya. The target population comprised 220 technical personnel drawn from donor-funded health projects operating in Kajiado County. The personnel comprised Medical Superintendents, Health Volunteers, Donor Representatives, County Government Representatives, Project Managers, and Programme Officers. A sample of 142 respondents was used while proportionate sampling ensured that all respondent categories were adequately represented.

Primary data were collected using a structured questionnaire designed around the study constructs. The collected data were coded and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including means and standard deviations, were used to summarize respondents' perceptions on the study variables. Pearson's correlation analysis examined the

strength and direction of relationships between the independent and dependent variables, while multiple linear regression analysis tested the hypothesized effects of Big Data Analytics tools on project performance. Statistical significance was evaluated at the 5% significance level ($p < 0.05$).

FINDINGS AND DISCUSSION

Response Rate

A total of 142 questionnaires were distributed to respondents drawn from donor-funded health projects in Kajiado County, of which 124 were correctly completed and returned, representing a response rate of 87.3%. This response rate was considered adequate for statistical analysis, as it exceeded the minimum threshold recommended by Mugenda and Mugenda (2003) and Babbie (2010), and was therefore sufficient to support reliable analysis and interpretation of the study findings.

Descriptive Results

Real Time Analytics and Performance of Donor Funded Health Projects

This objective aimed at evaluating the influence of real time data analytics on performance of Donor funded health projects in Kajiado County. The summarized results were presented as under in Table 1;

Table 1: Descriptive results of real time analytics

Statement	N	Mean	Std. Dev.
Our organization has access to real-time dashboards for monitoring project data.	124	3.96	0.712
Project data is collected and processed in real-time.	124	4.03	0.731
Real-time analytics tools are integrated with our project operations.	124	4.18	0.644
Our teams receive real-time alerts on emerging project issues.	124	4.15	0.836
Real-time analytics have reduced delays in decision-making.	124	3.92	0.652
Dashboards display real-time indicators of project performance.	124	4.32	0.838
We have mobile platforms that support real-time data collection in the field.	124	4.09	0.700
Project managers regularly use real-time data to adjust implementation plans.	124	3.91	0.755
Aggregate Mean		4.07	

The descriptive findings in Table 1 above, indicated that real-time analytics was widely adopted within donor-funded health projects in Kajiado County, as reflected by an aggregate mean score of 4.07 and relatively low standard deviations (0.644-0.838), suggesting general agreement among respondents. The results show that organizations had embraced real-time dashboards, analytics tools, mobile data collection platforms, and automated alert systems to support continuous monitoring and project management. The highest-rated aspect was the availability of dashboards displaying real-time project performance indicators ($M = 4.32$, $SD = 0.838$), while the use of real-time analytics to adjust implementation plans recorded the lowest mean score ($M = 3.91$, $SD = 0.755$).

These findings supported Dynamic Capability Theory, which emphasized on the importance of timely information and organizational responsiveness in improving performance. Gunasekaran et al. (2017), also found that real-time analytics improves operational control and organizational effectiveness.

Data Drive Decision Making and Performance of Donor Funded Health Projects

This objective sought to examine the influence of data driven decision making on performance of Donor funded health projects in Kajiado County. The summarized results were presented in Table 2

Table 2: Descriptive results of data-driven decision making

Statement	N	Mean	Std. Dev.
A large percentage of our project decisions are based on data analytics.	124	4.19	0.722
We use specific tools (e.g., dashboards, visualization, statistical models) to support decisions.	124	4.33	0.838
The use of data analytics has improved the quality of our decision-making.	124	4.27	0.820
Data is consulted before key project milestones or decisions are made.	124	4.08	0.833
Our leadership supports and promotes data-informed decision-making.	124	3.91	0.622
We use dashboards and analytics tools during team meetings.	124	4.22	0.750
Decisions made with data support have resulted in better project outcomes.	124	4.29	0.689
Employees are encouraged to present data when proposing solutions.	124	4.33	0.751
Aggregate Mean		4.20	

The descriptive findings on data driven decision making (Table 2) indicated that donor funded health projects in Kajiado County extensively relied on data analytics while making project decisions, as reflected by an aggregate mean score of 4.20 and relatively low standard deviations ranging from 0.622 to 0.838, suggesting a high level of agreement among respondents. The results show that donor funded health projects adequately used dashboards, data visualization tools, statistical models, and analytical evidence to inform project decisions.

The highest-rated aspects were the use of analytical tools to support decision-making and the encouragement of employees to present data when proposing solutions ($M = 4.33$), reflecting a strong culture of evidence-based management. Respondents also agreed that analytics improved decision quality and project outcomes, demonstrating the perceived value of data in enhancing efficiency, accountability, and project effectiveness. Conversely, leadership support for data-informed decision-making recorded the lowest mean score ($M = 3.91$, $SD = 0.622$), suggesting that managerial commitment to analytics adoption may vary across organizations. These findings supported the Knowledge-Based View Theory, which emphasized the strategic value of knowledge and information resources in enhancing organizational effectiveness, and also aligned with Davenport and Harris (2007) view, that analytics-driven organizations achieved superior performance outcomes.

Performance of Donor Funded Health Projects

The study sought to examine the influence of Big Data Analytics (BDA) on Performance of Donor funded health projects in Kajiado County, Kenya. Respondents were requested to indicate their level of agreement with statements measuring project performance based on donor regulation compliance, achievement of health milestones, and budget adherence. The results are presented in Table 3.

Table 3: Performance of donor funded health projects in Kajiado County

Statement	N	Mean	Std. Dev.
Our projects consistently comply with donor regulations and reporting requirements.	124	4.00	0.642
Our organization consistently meets donor compliance requirements throughout project implementation.	124	4.23	0.658
Donor-funded health projects successfully achieve the agreed donor performance requirements.	124	4.20	0.633
Our projects consistently achieve planned health milestones within the implementation period.	124	3.92	0.647
Most health targets are achieved according to the project implementation plan.	124	4.35	0.706
Big Data Analytics has improved the achievement of planned health milestones.	124	4.30	0.695
Project expenditure consistently remains within the approved donor budget.	124	4.17	0.822
Budget monitoring information is regularly used to improve financial accountability..	124	4.29	0.768
Our organization effectively manages project resources within the approved budget..	124	3.95	0.625
Aggregate Mean		4.16	

The descriptive findings in Table 3 above, indicated that donor-funded health projects in Kajiado County were largely performing well, as reflected by an aggregate mean score of 4.16 and relatively low standard deviations ranging from 0.625 to 0.822, suggesting a high level of agreement among respondents. The results showed strong performance in donor compliance, achievement of health milestones, and budget adherence. The highest-rated aspect was the achievement of health targets according to project implementation plans ($M = 4.35$, $SD = 0.706$), followed closely by the contribution of Big Data Analytics to achieving planned health milestones ($M = 4.30$, $SD = 0.695$) and the use of budget monitoring information to enhance financial accountability ($M = 4.29$, $SD = 0.768$).

These findings suggested that donor-funded health projects were successful in delivering intended outcomes while maintaining accountability and effective financial oversight. Conversely, timely achievement of planned health milestones ($M = 3.92$, $SD = 0.647$) and effective management of project resources within approved budgets ($M = 3.95$, $SD = 0.625$) recorded comparatively lower mean scores, indicating areas where implementation efficiency and resource utilization could be further strengthened. These findings support Results-Based Management Theory, which

emphasized performance measurement and evidence-based management. The findings were also consistent with Wamba et al. (2017) and Gunasekaran et al. (2017), who argued that analytics capabilities enhanced organizational performance by improving operational efficiency, accountability, and effective management of organizational resources.

Inferential Analysis Results

The inferential analysis involved both correlation and multiple regression analysis. Correlation analysis was used to determine the strength and direction of the relationship between the independent variables and the dependent variable, while multiple regression analysis was used to establish the extent to which the independent variables influenced performance of donor-funded health projects in Kajiado County. The study tested the influence of Real-Time Analytics, and Data-Driven Decision Making on the performance of donor-funded health projects in Kajiado County.

Correlation Analysis

Pearson Product Moment Correlation (PPMC) analysis was performed to determine the direction and strength of the relationships among the study variables. The results were presented in Table 4.

Table 4: Correlation Analysis Results

		PP	RTA	DDM
Project Performance	Pearson Correlation	1	.722**	.783*
	Sig. (2-tailed)		.000	.001
	N	124	124	124
Real-Time Analytics	Pearson Correlation	.722**	1	.716*
	Sig. (2-tailed)	.000		.002
	N	124	124	124
Data-Driven Decision Making	Pearson Correlation	.783*	.716*	1
	Sig. (2-tailed)	.003	.002	
	N	124	124	124

KEY: Project Performance (**PP**), Real-Time Analytics (**RTA**), and Data-Driven Decision Making (**DDM**)

The findings in Table 4 above revealed that Real-Time Analytics had a strong positive and statistically significant relationship with project performance ($r = 0.722$, $p < 0.01$). This implied that organizations using real-time dashboards, alerts, and monitoring systems experienced enhanced responsiveness and operational control. The findings support the argument by Gunasekaran et al. (2017) that real-time analytics strengthens organizational effectiveness by improving monitoring efficiency, communication, and timely decision-making.

The findings further established that Data-Driven Decision Making had the strongest positive relationship with performance of donor-funded health projects ($r = 0.783$, $p < 0.01$). This suggests that organizations relying on evidence-based management and analytics-supported decisions achieved better project outcomes, improved accountability, and enhanced service delivery performance. These findings were in agreement with LaValle et al. (2011) who found that data-driven organizations are more likely to achieve improved efficiency, innovation, and strategic effectiveness compared to organizations relying on intuition-based management approaches.

The findings supported the broader literature that emphasized the strategic role of Big Data Analytics in improving organizational efficiency, accountability, monitoring effectiveness, and evidence-based project management.

Multiple Linear Regression Analysis

The researcher conducted multiple regression analysis to determine the combined influence of Real-Time Analytics, and Data-Driven Decision Making on the performance of donor-funded health projects in Kajiado County. The overall model demonstrated strong explanatory power, with a coefficient of determination ($R^2 = 0.738$) indicating that 73.8% of the variation in project performance was explained jointly by the Big Data Analytics dimensions included in the model as presented in Table 5.

The regression model adopted was: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + e$

Model Summary

The model summary results were presented in Table 5 as under;

Table 5: Model Summary

Model	R	R Square	Adjusted Square	RStd. Error of the Estimate
1	.859 ^a	.738	.729	.417

a. Predictors: (Constant), Real-Time Analytics (RTA), and Data-Driven Decision Making (DDM)

The overall model demonstrated strong explanatory power, with a coefficient of determination ($R^2 = 0.738$) indicating that 73.8% of the variation in project performance was explained jointly by the Big Data Analytics dimensions included in the model as presented in Table 5.

Analysis of Variance (ANOVA)

The ANOVA test was used to determine the model's significance in this study. This was done expressly to see if the variation in the independent variables could account for the observed variance in the outcome (Dean & Illowsky 2013). The outcomes were presented in Table 6 below;

Table 6: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	58.274	4	14.568	83.724	.000 ^b
	Residual	20.671	119	.174		
	Total	78.945	123			

a. Dependent Variable: Project performance

b. Predictors: (Constant), Real-Time Analytics (RTA), and Data-Driven Decision Making (DDM)

The ANOVA results established that the regression model was statistically significant ($F = 83.724$, $p < 0.001$), indicating that the independent variables jointly exerted a statistically significant influence on the performance of donor-funded health projects in Kajiado County. The significance of the F-statistic demonstrated that the regression model was appropriate for explaining the relationship between Big Data Analytics and the performance of donor-funded health projects as measured by donor regulation compliance, achievement of health milestones, and adherence to approved project budgets.

Regression Beta Coefficients

Table 7: Regression Beta Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.812	.294		2.762	.001
	RTA	.218	.064	.246	3.406	.001
	DDM	.334	.071	.387	4.704	.000

a. Dependent Variable: Project Performance (PP)

As indicated in the above Table 7 and based on the multiple regressions model, the regression coefficient findings revealed that all the independent variables had a positive and statistically significant influence on performance of donor-funded health projects in Kajiado County. The positive beta coefficients implied that improvement in any of the Big Data Analytics dimensions resulted in corresponding improvement in project performance.

Real-Time Analytics had a positive and statistically significant influence on project performance ($\beta = 0.218$, $p = 0.001$). This implied that organizations utilizing real-time dashboards, alerts, and mobile data collection systems experienced improved operational responsiveness, coordination, and implementation efficiency. Real-time analytics facilitates continuous monitoring of project

activities, enabling managers to identify operational gaps and make timely corrective interventions. The findings further suggested that real-time information systems improved project visibility, communication, and accountability within donor-funded health projects. These findings were consistent with Côte-Real et al. (2020), who found that real-time analytics significantly improves operational agility, monitoring efficiency, and organizational responsiveness. Similarly, Mwangi (2023) established that integration of real-time monitoring systems in Kenyan donor-funded projects enhanced implementation efficiency, reporting accuracy, and responsiveness to emerging operational challenges.

The findings further established that Data-Driven Decision Making had the strongest positive and statistically significant influence on project performance ($\beta = 0.334$, $p < 0.001$). This indicated that organizations that extensively relied on dashboards, statistical models, data visualization systems, and evidence-based management practices were more likely to achieve improved project outcomes and service delivery effectiveness. The findings implied that data-driven cultures promote transparency, accountability, strategic coordination, and effective allocation of organizational resources. The strong coefficient further suggested that analytics-supported decisions contributed significantly towards improving implementation efficiency and achievement of donor-funded project objectives. The findings concurred with Awan et al. (2021), who established that data-driven decision-making enhances organizational performance through improved strategic alignment and operational effectiveness. In Kenya, Kariuki (2022) similarly found that organizations adopting evidence-based decision-making practices recorded improved project outcomes, enhanced service delivery, and stronger organizational accountability.

The regression equation derived from the model was:

$$Y = 0.812 + 0.218 X_3 + 0.334 X_4 + e$$

The regression findings therefore demonstrate that Big Data Analytics significantly influences the performance of donor-funded health projects in Kajiado County. The findings reinforced the view that Big Data Analytics capabilities constitute strategic organizational resources that enhance evidence-based project management, optimize resource utilization, and improve the overall performance of donor-funded health projects.

CONCLUSION

The study concluded that real-time analytics significantly improves the performance of donor-funded health projects in Kajiado County. Organizations that use real-time information to monitor project activities are better able to identify implementation challenges promptly, coordinate project operations effectively, and take timely corrective actions. These capabilities enhance project implementation, strengthen compliance with donor requirements, improve the achievement of planned health milestones, and support prudent utilization of project resources.

The study further concluded that data-driven decision-making has a significant positive influence on the performance of donor-funded health projects. Organizations that embed evidence-based decision-making into project planning, monitoring, and resource allocation are better positioned to make informed managerial decisions, improve accountability, optimize resource utilization, and respond effectively to changing project conditions. Consequently, data-driven decision-making contributed to improved donor compliance, successful achievement of health milestones, and adherence to approved project budgets.

Recommendations

Donor-funded health projects should strengthen the use of real-time analytics by investing in integrated monitoring systems and digital platforms that support continuous project monitoring and timely response to implementation challenges. In addition, organizations should institutionalize data-driven decision-making by promoting the use of analytical evidence in planning, monitoring, evaluation, and resource allocation to enhance accountability, transparency, and overall project performance.

Suggestions for Further Studies

The researcher recommended for more research to focus on different sectors to enhance the generalizability and applicability of the findings across diverse organizational settings. In addition, comparative studies involving public sector health projects, private sector health projects, and non-governmental organizations would provide broader insights into the role of analytics capabilities in enhancing project performance.

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