

Assessed End-Users' Perceptions on the Benefits of Adopting Project Management Computer Tools in Commercial Property Development Projects in Port Harcourt, Rivers State, Nigeria

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Abstract

Original Research Article

The increased complexity of commercial property development required project management computer tools (PMCTs), yet limited adoption of PMCTs exists on end-user's perceptions of their benefits within Nigeria's commercial property development sector. This study assessed end-user's perceptions of the benefits of project management computer tools (PMCTs) for efficient commercial property development in Port Harcourt, Rivers State, Nigeria. A descriptive survey design using quantitative methods was adopted. Primary data were collected through structured questionnaires administered to building professionals. Out of the 310 questionnaires distributed, 288 valid responses were retrieved, representing a 93% response rate. Data were analyzed using descriptive statistics, including frequency distribution, mean score, standard deviation, and the Relative Importance Index (RII), to evaluate the perceived benefits of PMCTs. The findings revealed that end-users generally perceive project management computer tools as beneficial for improving project planning, scheduling, communication, coordination, cost control, transparency, documentation, monitoring, decision making, investment security, and overall project efficiency. The study further showed that enhanced stakeholder collaboration, timely project delivery, effective resource utilization, and improved project quality are the major benefits of adopting these digital technologies. However, inadequate user training, high software acquisition costs, limited digital infrastructure, and resistance to technological change remain significant barriers to their effective adoption. The study concluded that greater investment in project management technologies, continuous professional training, and supportive organizational policies will improve the efficiency, effectiveness, and sustainability of commercial property development in Port Harcourt.

Keywords: End-User's Perception, Project Management, Commercial Property Development.

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1.0 INTRODUCTION

The construction and real estate industries have become increasingly dependent on digital technologies to improve project planning, communication, monitoring, and overall project

delivery. Among these technologies, project coordination management computer tools have become essential for managing the complexity of commercial property development projects. These tools help project teams organize project activities,



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allocate resources effectively, monitor project progress, manage costs, reduce delays, and improve collaboration among stakeholders (Kerzner, 2022; Project Management Institute (PMI), 2021). As commercial property developments continue to increase in size and complexity, the effective use of project management computer tools has become an important factor in achieving successful project outcomes. Commercial property development involves the planning, design, financing, construction, marketing, and management of income generating properties such as office buildings, shopping malls, hotels, warehouses, and mixed use developments. These projects usually involve multiple professionals, including estate surveyors and valuers, architects, engineers, quantity surveyors, contractors, project managers, financial institutions, and government agencies. Coordinating the activities of these stakeholders requires effective project management systems that can support timely communication, proper documentation, and informed decision-making (Ofori, 2018; PMI, 2021).

Project management computer tools are software applications designed to support project planning, scheduling, budgeting, communication, document management, risk assessment, and performance monitoring. Popular examples include Microsoft Project, Primavera P6, Asana, Trello, Jira, Monday.com, and Oracle Aconex. These tools enable project teams to create work schedules, monitor project milestones, allocate resources, manage project risks, and generate reports that improve transparency and accountability (Kerzner, 2022). Their adoption has significantly transformed project delivery across many developed and developing countries. Globally, organizations have increasingly embraced digital project management solutions because they improve efficiency, reduce project costs, enhance communication, and support better decision made. The Project Management Institute (2021) notes that organizations using modern project management technologies are more likely to complete projects within budget and schedule while achieving higher stakeholder satisfaction. Similarly, digital transformation in the

construction industry has improved collaboration among project participants through cloud-based platforms, real time data sharing, and automated reporting systems (Marnewick & Marnewick, 2020).

In many developing countries, including Nigeria, the adoption of project management computer tools has grown steadily over the past decade. Increased internet access, improvements in information and communication technology (ICT), and greater awareness of project management best practices have encouraged construction professionals to adopt digital solutions for project delivery (Aigbavboa & Thwala, 2020). However, the level of adoption varies among organizations due to factors such as cost, technical expertise, organizational culture, management support, and infrastructure availability (Adeleke et al., 2019). Nigeria's commercial property sector has experienced significant growth due to rapid urbanization, population increase, private sector investment, and expanding commercial activities. Cities such as Lagos, Abuja, Port Harcourt, Kano, and Ibadan have witnessed substantial investments in office complexes, shopping centres, hotels, and mixed-use developments (Oladokun & Aluko, 2021). As these projects become more complex, the need for efficient project management practices supported by digital tools has become increasingly important.

Port Harcourt, the capital of Rivers State, is one of Nigeria's major economic and commercial centres. The city hosts numerous commercial property developments driven by the oil and gas industry, financial institutions, hospitality businesses, retail investments, and government infrastructure programmes. Commercial developments in Port Harcourt often involve large financial investments and multiple stakeholders whose activities must be effectively coordinated to ensure project success. Consequently, project management computer tools have become valuable resources for improving planning, communication, scheduling, quality control, and overall project performance. Despite the increasing use of project management computer tools in commercial property development, their effectiveness is often judged differently by various

project participants. While project managers and developers may focus on technical performance indicators such as cost savings and schedule control, end-users often evaluate projects based on functionality, quality, timely delivery, ease of use, and satisfaction with the completed facilities (Zwikaël & Smyrk, 2019). Understanding end-users' perceptions is therefore important because their experiences provide valuable feedback on whether these digital tools contribute to delivering projects that meet users' needs and expectations.

Previous studies have reported several benefits associated with the use of project management computer tools. These included improved project planning, better communication, enhanced collaboration among project teams, efficient resource management, reduced project delays, improved quality control, effective risk management, and increased client satisfaction (Aigbavboa & Thwala, 2020; Kerzner, 2022). However, many existing studies have concentrated on the views of project managers, contractors, consultants, and other construction professionals, with relatively limited attention given to the perceptions of end-users, particularly within Nigeria's commercial property sector. The views of end-users are important because they directly experienced the quality and functionality of completed commercial properties. Their perceptions can help developers, project managers, estate surveyors and valuers, and policy makers understand whether investments in project management computer tools translate into better project outcomes.

However, assessing these perceptions can also identify areas where digital project management practices require improvement to enhance project efficiency and user satisfaction. This study therefore assesses end-users' perceptions of the benefits of project management computer tools for efficient commercial property development in Port Harcourt, Rivers State, Nigeria. The findings are expected to contribute to the growing body of knowledge on digital project management within the Nigerian real estate and construction industries and provide practical recommendations for improving project

delivery through the effective use of project management computer tools.

2.0 LITERATURE REVIEW

2.1 Concept of Project Management Computer Tools (PMCTs)

Project management computer tools are software applications designed to support the planning, scheduling, execution, monitoring, control, and completion of projects (Nicholas & Steyn, 2020). These tools provide project managers and other stakeholders with digital platforms for organizing project activities, allocating resources, monitoring progress, managing costs, communicating effectively, and evaluating project performance. As construction and property development projects become increasingly complex, project management computer tools have become indispensable for improving project efficiency, reducing uncertainty, and supporting informed decision making (Kerzner, 2022; Project Management Institute (PMI), 2021). Project management computer tools have evolved significantly from simple scheduling software to integrated digital management systems. Aigbavboa & Thwala (2020) opine that the early applications of PMCTs primarily focused on project scheduling and resource allocation.

However, PMCTs contemporary software now integrates functions such as cost management, document control, quality assurance, risk management, stakeholder communication, procurement management, reporting, and performance evaluation into a single platform (PMI, 2021). Commonly used applications include Microsoft Project, Oracle Primavera P6, Autodesk Construction Cloud, Procore, Asana, Trello, Monday.com, and Building Information Modelling (BIM)-enabled project management systems. These technologies enable project teams to collaborate in real time regardless of their geographical locations, thereby improving coordination and productivity (Nicholas & Steyn, 2020). Cloud computing, mobile technology, artificial intelligence, and data analytics have further transformed project management computer tools by providing real-time project information and automated reporting. These

technological innovations enable project managers to identify emerging risks early, monitor project performance continuously, and implement corrective actions promptly (Aigbavboa & Thwala, 2020). Consequently, digital project management has become a strategic approach for delivering projects more efficiently while meeting stakeholders' expectations.

2.2 Commercial Property Development

Commercial property development referred to the systematic process of acquiring land, planning, financing, designing, constructing, marketing, and managing properties intended primarily for commercial purposes. Such properties included office buildings, shopping centres, hotels, retail complexes, industrial facilities, warehouses, business parks, and mixed use developments (Oladokun & Aluko, 2021). Unlike residential developments, commercial property projects focused on generating economic returns through business operations, rental income, investment appreciation, or commercial services (Miles et. al., 2015). Commercial property development involves several interconnected stages, including feasibility studies, land acquisition, project financing, design development, statutory approvals, procurement, construction, commissioning, leasing, and post-construction management (Kerzner, 2022). Each stage required effective planning, coordination, communication, and monitoring among multiple stakeholders such as developers, architects, engineers, contractors, quantity surveyors, estate surveyors and valuers, investors, regulatory agencies, and end-users.

The commercial property sector in Nigeria has expanded considerably over the past two decades due to rapid urbanization, population growth, increasing private investment, and expanding business activities (Oladokun & Aluko, 2021). However, developers continue to face challenges such as project delays, cost overruns, inflation, inadequate infrastructure, fluctuating exchange rates, regulatory bottlenecks, and ineffective coordination among project participants. These challenges often reduce project performance and negatively affect client satisfaction

(Aigbavboa & Thwala, 2020). Consequently, project management computer tools have become increasingly important for improving planning accuracy, project control, communication, and overall delivery efficiency.

2.3 End-Users in Commercial Property Development

End-users are the individuals, organizations, or institutions that ultimately occupy, operate, own, manage, or directly benefit from completed commercial property developments. Depending on the nature of the development, end-users may include business organizations, corporate tenants, retail operators, investors, government agencies, financial institutions, facility managers, customers, and property owners (Aigbavboa & Thwala, 2020). Traditionally, project success was measured using the "iron triangle" of cost, time, and quality. However, contemporary project management literature recognizes that these measures alone do not fully reflect project success. Greater emphasis is now placed on user satisfaction, operational functionality, ease of maintenance, adaptability, environmental sustainability, and long term value creation (Shenhar & Dvir, 2007). Since end-users are the ultimate beneficiaries of completed projects, their experiences and opinions provide valuable evidence for assessing whether project objectives have been achieved effectively. In commercial property development, end-users evaluate completed projects based on functionality, accessibility, operational efficiency, safety, comfort, flexibility, maintenance requirements, and the extent to which the facilities support their business activities (Babatunde et. al., 2020). Therefore, understanding end-users' perceptions provides valuable insights into the practical effectiveness of project management computer tools during project delivery.

2.4 End-Users' Perceptions in Project Management Computer Tools

In this study, end-user's perceptions referred to the opinions, attitudes, beliefs, and levels of satisfaction which regarded the contribution of project

management computer tools to efficient commercial property development. Although, perceptions influenced technology acceptance, continued system usage, and organizational innovation. According to the Technology Acceptance Model (TAM), end-users were more likely to adopt technological innovations when they perceive them as useful and easy to use (Davis, 1989). Perceived usefulness referred to the degree to which users believed that technology enhanced job performance, while perceived ease of use reflected the extent to which users believed that technology required minimal effort. These two factors significantly influenced users' behavioral intentions and actual technology utilized (Olanrewaju et. al., 2021).

Similarly, the Information Systems Success Model suggested that system quality, information quality, and service quality determined user satisfaction and the overall success of information systems (DeLone & McLean, 2003). Applied to project management computer tools, these concepts indicated that positive end-user perceptions were likely to increase system acceptance and improve project outcomes.

2.5 Benefits of Project Management Computer Tools

Project management computer tools provided numerous benefits throughout the commercial property development process. One major benefit is improved project planning and scheduling. Software applications enabled project managers to prepare realistic work schedules, identify critical activities, allocate resources effectively, and monitored project progress continuously (Babatunde et. al., 2020). This contributed to timely project completion and reduced unnecessary delays. Another important benefit was enhanced communication and collaboration among project stakeholders. Modern cloud based platforms enabled project participants to share project information instantly, monitored progress remotely, and collaborate regardless of location (Olanrewaju et. al., 2021). This improved coordination among architects, engineers, contractors, consultants, developers, and clients while reducing communication breakdowns and decision making delays. Akinradewo et al. (2019) stated that project

management computer tools also strengthened cost management by facilitating budgeting, expenditure tracking, forecasting, earned value analysis, and financial reporting. Project managers identified cost deviations early and implemented corrective measures before budget overruns became significant. Effective financial monitoring contributed to improved project accounted for and resource utilized.

However, risk management was another significant advantage. Digital project management systems supported risk identified, assessed, documented, monitored, and mitigated throughout the project lifecycle (Akadiri, 2023). Early identification of potential risks enabled proactive decision making and reduced uncertainty during project implementation. Similarly, Kerzner (2022) noted that document management was equally enhanced through digital platforms that centralized project documents, drawings, contracts, specifications, inspection reports, correspondence, and variation orders. Improved document control reduces information loss, prevents duplication, ensures version consistency, and strengthened accountability. Furthermore, project management computer tools improved project monitoring and performance evaluation through dashboards, automated reporting, key performance indicators, and real time analytics (PMI, 2021). These features supported evidence based decision made and improved organizational learning for future projects.

Despite these advantages, successful implementation depended on organizational readiness, management commitment, user competence, adequate training, technological infrastructure, financial resources, and effective change management. In developing economies such as Nigeria, challenges included limited digital infrastructure, inconsistent electricity supply, high software acquisition costs, inadequate technical expertise, and resistance to organizational change which limited widespread adoption (Moshood et.al, 2020; Babatunde, et.al, 2020). Addressing these barriers is essential for maximizing the benefits of project management computer tools in commercial property development. Generally, project management computer tools have become indispensable instruments for improved planning,

coordination, communication, monitoring, and decision making in commercial property development. Their successful implementation not only enhanced project performance but also increased stakeholder satisfaction and operational efficiency. Assessed end-users' perceptions of these benefits was therefore essential for understanding the effectiveness of digital project management practices and identifying opportunities for improved commercial property development in Port Harcourt, Rivers State, Nigeria.

2.6 Empirical Review

Empirical evidence indicated that project management computer tools had significantly improved planning, coordination, communication, cost control, and project delivery in the construction and property development sectors. However, the level of adoption and the benefits realized differed across countries because of variations in technological infrastructure, organizational readiness, users' competence, and institutional support. In this vein, Babatunde et. al., (2020) investigated the uptake of Building Information Modelling (BIM) among contracting firms in Lagos State. The study examined BIM awareness, utilization, implementation barriers, and improvement strategies as it used questionnaire survey and descriptive and inferential statistical tool. The findings showed that although construction professionals recognized BIM as an effective project management computer tool capable of improved collaboration, project coordination, information sharing, and decision making, its adoption remained relatively low because of high software costs, inadequate technical expertise, and insufficient organizational support. The study concluded that greater investment in training and institutional support would improve digital project management practices within the Nigerian construction industry.

Similarly, Olanrewaju et al. (2021) examined the drivers influencing BIM implementation within the Nigerian construction industry. Data were collected from construction professionals using structured questionnaires and analyzed through descriptive statistics. The study found that organizational

commitment, management support, client demand, technological readiness, and continuous professional training significantly encouraged BIM adoption. The authors concluded that increasing these enabling factors would improve project efficiency, communication, and stakeholder collaboration throughout project delivery. Another study by Akinradewo et. al., (2019); investigated the training gaps affecting BIM adoption among construction professionals. Survey data from 212 registered professionals showed that inadequate digital skills, insufficient formal training, and limited practical exposure reduced the effective utilization of project management technologies. The study recommended continuous professional development programmes to strengthen users' competence and maximize the benefits of digital project management systems.

Furthermore, Akadiri (2023) analyzed BIM implementation in the Nigerian construction industry using an industry wide questionnaire survey. The findings identified lack of awareness, shortage of trained professionals, and high software acquisition costs as the major barriers to technology adoption. Nevertheless, respondents acknowledged that BIM significantly improves project planning, coordination, cost estimation, communication, and overall project performance when properly implemented.

Hence, the reviewed empirical studies consistently indicated that project management computer tools improved planning, scheduling, communication, collaboration, cost management, document control, and decision making in construction projects (Moshood et.al, 2020; Babatunde, et.al, 2020). Nevertheless, the studies by Akadiri (2023); Olanrewaju et. al., (2021); Akinradewo et. al., (2019) also shows that technology adoption remained constrained by financial, technical, organizational, and institutional challenges, particularly in developing countries. Although several studies by Oladokun & Aluko (2021); Marnewick & Marnewick (2020); Adeleke et. al., (2019) have examined BIM adoption and digital technologies within the construction industry, very few have specifically investigated end-users' perceptions of the benefits of project management computer tools for efficient commercial property development.

Moreover, limited empirical evidence exists within the context of Port Harcourt, Rivers State, where commercial property development continued to expand rapidly. This contextual gap justified the present study, which evaluated how end-users perceived the benefits of project management computer tools and how these perceptions contributed to more efficient commercial property development.

3.0 RESEARCH METHODOLOGY

This study adopted a quantitative research approach which used a cross-sectional survey design to assess the end-user's perceptions of the benefits of project management computer tools for efficient commercial property development. The quantitative approach was considered appropriate because it enabled the systematic collection and analysis of numerical data from relatively large number of respondents and facilitates. The study population comprised end-users of commercial property developments in Port Harcourt, included memberships of Nigerian Institution of Estate Surveyors and Valuers (NIESV), Nigerian Institute of Building (NIOB), Nigerian Institute of Architects (NIA), Nigerian Society of Engineers (NSE), Nigerian Institute of Quantity Surveyors (NIQS), Real Estate Developers Association of Nigeria (REDAN) Rivers State branches in Rivers State. According to records obtained from the Rivers State Ministries of Works, Urban Development & Housing indicated that there 1,590 members across the 5 Chapters professional bodies in Rivers State (Rivers State Government Bulletin, 2024); with a sample size of 310 using the Krejcie and Morgan's (1970) formula. These group of respondents were selected because they actively participated in commercial property development executed in both public and private sectors. And they also possessed practical knowledge and experience regarding the outcomes of projects managed with computer based project management tools.

Primary data were obtained through the administration of 310 copies of structured

questionnaires, out of which 288 copies were successfully retrieved, representing an 93% response rate. A simple random sampling technique was employed to select the 288 respondents, comprising members of; NSE with 78 respondents (27.08%), NIA with 63 respondents (21.88%), NIESV with 60 respondents (20.83%), REDAN) accounted for 48 respondents (16.67%), while NIQS contributed 24 respondents (8.33%), and NIOB) had the lowest representation with 15 respondents (5.21%). This ensured adequate representation of respondents across the selected professional groups and study locations.

The questionnaire was structured to obtain respondents' measures of end-user's perceptions regarding the benefits of project management computer tools. Prior to the main survey, the questionnaire was subjected to expert review and pilot testing to ensure clarity, validity, and reliability. Data collected from the quantitative survey were analyzed with descriptive statistical techniques, including frequencies, percentages, mean scores, and standard deviations used to summarize respondents' characteristics and evaluate their perceptions, while the relative importance index (RII) was computed to rank the perceived benefits of project management computer tools accordingly.

4.0 RESULTS AND DISCUSSION

4.1 Benefits of PM Tool Integration into Commercial Property Development

Table 1 illustrated the perceived benefits of using project management (PM) computer tools in commercial property development projects in Port Harcourt. Data for this objective were analyzed using frequency distribution and percentages, mean score, standard deviation, and relative importance index (RII). Mean and standard deviation measure respondents' perception levels, while RII will rank the benefits according to significance. The benefit with the highest RII value was considered the most important.

Table 4.1: End-Users' Perceived Benefits of PMCTs

End-Users' Perceived Benefits	SA	A	12	D	SD	Mean	STD	RII	Rank
Improved project planning and scheduling	178	83	16	8	3	4.48	0.77	0.896	1 st
Enhanced communication and collaboration	170	86	18	10	4	4.42	0.81	0.884	3 rd
Better monitoring and progress tracking	168	87	19	10	4	4.41	0.81	0.882	4 th
Efficient resource allocation	160	88	22	13	5	4.34	0.88	0.868	7 th
Reduction in project delays	165	86	21	12	4	4.38	0.84	0.876	5 th
Improved cost control	158	89	23	13	5	4.33	0.88	0.866	8 th
Enhanced decision-making	171	84	20	10	3	4.43	0.80	0.886	2 nd
Effective risk management	154	90	24	14	6	4.29	0.90	0.858	11 th
Improved quality management	161	87	23	12	5	4.35	0.87	0.870	6 th
Increased accountability and transparency	152	91	25	15	5	4.28	0.89	0.856	12 th
Better documentation and record management	150	92	26	15	5	4.27	0.89	0.854	13 th
Enhanced stakeholder coordination	157	88	24	14	5	4.32	0.88	0.864	9 th
Greater client satisfaction	149	91	27	16	5	4.26	0.90	0.852	14 th
Increased productivity and operational efficiency	156	89	23	15	5	4.31	0.88	0.862	10 th
Improved time management	149	90	28	16	5	4.25	0.90	0.850	15 th
Better procurement and contract administration	143	92	30	17	6	4.21	0.93	0.842	17 th
Improved performance evaluation	145	91	29	17	6	4.22	0.92	0.844	16 th
Enhanced regulatory compliance	139	94	30	18	7	4.18	0.95	0.836	19 th
Improved organizational competitiveness	141	92	30	18	7	4.19	0.94	0.838	18 th
Overall improvement in commercial property development performance	154	89	25	15	5	4.30	0.88	0.860	11 th

Rule: 4.50–5.00 = Very High Perceived Benefit, 3.50–4.49 = High Perceived Benefit, 2.50–3.49 = Moderate Perceived Benefit, 1.50–2.49 = Low Perceived Benefit, 1.00–1.49 = Very Low Perceived Benefit

Source: Author's Field Survey, 2026

Table 2 revealed that more than half of the respondents generally held strong positive perceptions regarding the benefits of project management computer tools in enhancing efficient

commercial property development in Port Harcourt. All twenty indicators recorded mean scores above 4.18 and relative importance index (RII) values ranging from 0.836 to 0.896, which suggested a

widespread agreement that these technologies have significantly improved project performance. The highest-ranked perceived benefit was improved project planning and scheduling (Mean = 4.48, SD = 0.77, RII = 0.896). This suggested that respondents considered planning and scheduling software as the most valuable contribution of project management computer tools, particularly in coordinating project timelines, allocating tasks, and minimizing scheduling conflicts. The relatively low standard deviation indicates strong consensus among respondents.

However, the second-ranked benefit was enhanced decision making (Mean = 4.43, SD = 0.80, RII = 0.886). Respondents perceived that computerized project management systems provide timely and reliable information that supported informed managerial decisions throughout the project lifecycle. While the third-ranked benefit was enhanced communication and collaboration (Mean = 4.42, SD = 0.81, RII = 0.884). This demonstrated that respondents recognized the importance of digital collaboration platforms for improved communication among clients, and building professionals, for a reduced misunderstandings and facilitated project coordination. Similarly, better monitoring and progress tracking (Mean = 4.41, RII = 0.882) and reduction in project delays (Mean = 4.38, RII = 0.876) ranked highly, indicating that respondents believe project management software enabled continuous monitoring of project activities and early detection of schedule deviations.

Other highly rated perceived benefits included improved quality management, efficient resource allocation, improved cost control, and enhanced stakeholder coordination, all of which recorded RII values exceeding 0.860. These findings suggested that respondents perceived project management computer tools has improved the efficient utilization of labour, materials, finances, and equipment while supporting better quality assurance and stakeholder engagement. Although enhanced regulatory compliance (Mean = 4.18, RII = 0.836) and improved organizational competitiveness (Mean = 4.19, RII = 0.838) ranked comparatively lower, their mean scores remain well above the acceptance threshold of 3.50, indicating that respondents still

acknowledge these as important benefits. Consequently, the consistently high mean scores and relatively low standard deviations demonstrated strong agreement among respondents as regards the positive role of project management computer tools in improving efficiency across commercial property development projects.

The findings in Table 2 showed that end-users perceived project management computer tools as strategic technologies that significantly improved project delivery in Port Harcourt. They emphasized on planning, scheduling, communication, monitoring, and decision making which reflected the growing reliance of the Nigerian construction and property development industry on digital project management solutions to address project complexity, rising construction costs, and increasing stakeholder expectations. The prominence of planning and scheduling as the highest-ranked benefit aligned with industry practice, where applications such as Microsoft Project, Primavera P6, and cloud based collaboration platforms were widely used to organize project activities, monitor critical paths, and optimized resource utilization. Similarly, the high ratings for communication, monitoring, and stakeholder coordination reflect the importance of integrated information systems in facilitating collaboration among multidisciplinary project teams.

The relatively lower ranking of regulatory compliance and organizational competitiveness does not imply these benefits were unimportant. Rather, respondents may have perceived them as indirect outcomes that emerged after organizations have effectively implemented project management computer tools and institutionalized their use. However, the findings demonstrated that end-users regard project management computer tools as essential enablers of efficient commercial property development in Port Harcourt. The positive perceptions across all measured indicators underscored the importance of encouraging wider adoption of digital project management technologies for improved project planning, cost control, communication, risk management, quality assurance, and overall project performance.

4.3 Respondents' Perception Levels of the Benefits of Integrating PM Tools

Figure 1 showed the respondents' perception levels

of the benefits of integrating PM tools into commercial property development projects among various stakeholders in Port Harcourt.

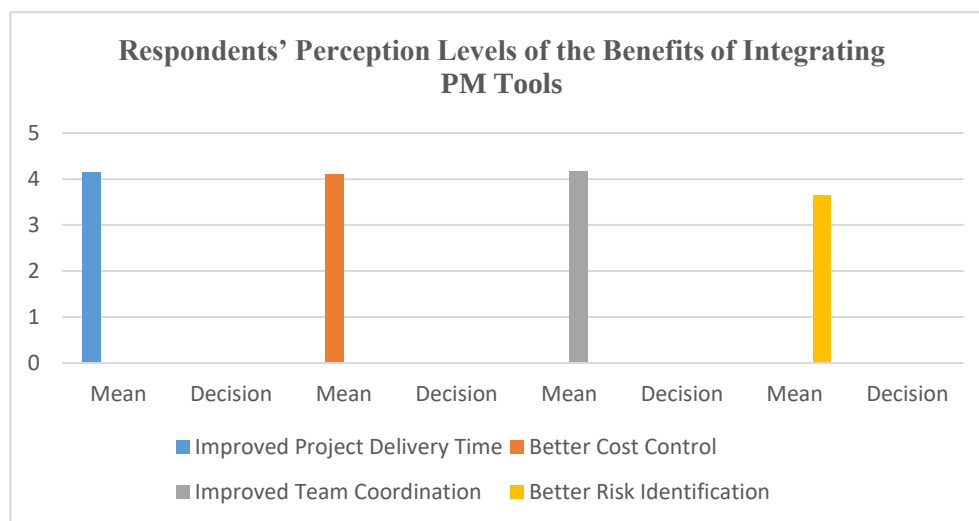


Figure 1: Respondents' Perception Levels of the Benefits of Integrating PM Tools

Source: Author's Field Survey, 2026

Figure 1 indicated that improved team coordination ranked highest (4.17), which showed that PM tools significantly improved communication flow and task synchronization. Improved project delivery time (4.14) and better cost control (4.09) also ranked high, which emphasized their relevance in addressing delays and cost overruns. Better risk identification had the lowest mean (3.64) but still remained high, showing growing recognition of risk management benefits despite relatively lower software adoption. This reflected Port Harcourt's commercial construction environment, where delays, cost fluctuations, and coordination gaps are major concerns. These results replicated the present realities in Port Harcourt's commercial real estate sector: that the growing complexity of malls, plazas, and mixed use developments has increased PM software relevance. This reflected Port Harcourt's commercial property environment where disputes over project variations are common, record keeping is critical for contractor accountability, and project delays significantly affect rental income projections. Developers increasingly depend on PM tools to maintain project transparency. The implication is

that PM computer tools are increasingly seen not merely as operational support systems but as strategic tools for enhanced project success, investor protection, and profitability.

5.0 CONCLUSION AND RECOMMENDATIONS

(a). Conclusion

The study established that Commercial property development projects developed has increased in complexity; as project management computer tools have become indispensable for improving project efficiency, reduced uncertainty, and supported informed decisions made. And the process through which individuals interpret information, form opinions, and evaluate experiences based on their knowledge, expectations, beliefs, and interactions with project management computer tools had been challenged in a particular system or environment. This study assessed the end-user's perceptions of the benefits of project management computer tools for efficient commercial property development in Port

Harcourt, Rivers State, Nigeria. The findings demonstrated that project management computer tools played significant roles in enhanced project planning, scheduling, communication, coordination, documentation, monitoring, cost management, and decision making throughout the commercial property development process. End-users generally acknowledged that these digital technologies contributed to improved project efficiency, better stakeholder collaboration, enhanced resource utilization, higher project quality, and timelier project delivered.

The study further established that the successful implementation of project management computer tools depended not only on the availability of appropriate software but also on organizational commitment, adequate digital infrastructure, continuous user training, management support, and willingness to embrace technological innovation. Although respondents recognized the numerous benefits associated with these tools, barriers such as inadequate technical expertise, high implementation costs, insufficient training opportunities, and limited technological infrastructure continue to constrain their effective utilization within the study area. The study therefore concluded that wider adoption and effective utilization of project management computer tools has substantially improved the performance and sustainability of commercial property development projects in Port Harcourt. The objective was further achieved through the investment of property developers, project managers, consulting firms, professional institutions, and government agencies in digital capacity building, modern project management technologies, and supportive organizational policies that encouraged technology adoption. Such efforts strengthened project delivery, improve stakeholder satisfaction, minimize project risks, and enhanced the overall competitiveness of the commercial property sector in Rivers State and Nigeria as a whole. The findings also provided valuable empirical evidence for researchers and policymakers who sought to promote digital transformation and innovation within the Nigerian construction and real estate industries.

(b). Recommendations

Based on the findings; the following recommendations were made:

Promote the Adoption of Project Management Computer Tools: Property developers, project managers, consulting firms, and other stakeholders should increase the adoption and effective use of project management computer tools by investing in modern digital technologies. This will benefit to improve project planning, communication, coordination, cost control, and timely delivery of commercial property development projects in Port Harcourt.

Strengthen Capacity Building and Digital Infrastructure: Government agencies, professional bodies, and construction organizations should provide regular training programmes, technical support, and adequate digital infrastructure to enhance users' competence in project management computer tools. This will assist to improve end-user's acceptance, maximize the benefits of digital project management, and contribute to more efficient and sustainable commercial property development.

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