ISSN No:-2456-2165

Investigating the Influence of Project Management Information System on Project Outcomes in Developing Economy

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Abstract:- The low penetration of information technologies and systems in most sectors of developing nations is responsible for its slow-paced development. Project execution faces the challenges of improper use of project resources and the traditional project management of the project lifecycle. The lifecycle of project development tends to follow traditional/manual procedures. Therefore, there is need to explores the influence of project management information system on project outcomes in Nigeria. Questionnaire was used to collect data from 130 respondents with primary aim of investigating the adoption of PMIS tools in the management of projects and their significant influence on the project outcome. Collected data were analyzed quantitatively using statistics. The use of Project Management Information System application tools and the frequency of its usage were the key components of PMIS implementation that were observed to have significant influences on project outcomes. The use of PMIS tools is positively related to the project outcomes. This suggests an expected improvement in project outcome with the continuous use of PMIS tools. With the advancement in technology and globalization of the world economy, organizations must take advantage of information systems. Organizations in developing nations must evolve to become technology-driven for better project outcomes.

Keywords:- *Project Strategies, Project Outcomes, Project Management, Project Risk.*

I. INTRODUCTION

Developing nations have in recent times witnessed a rise in developmental projects both publicly and privately sponsored. Several of these projects often fail or are abandoned due to numerous challenges largely caused by ineffective management of projects (Đurković & Raković, 2009). The low penetration of information technologies and systems in most sectors of this region is responsible for its slow-paced development. Project execution faces the challenges of improper use of project resources (money, facilities, time, and people) and the traditional project management of the project lifecycle. For instance, in Nigeria, most projects are considered to be high-risk due to the economic situation (Zuofa & Ochieng, 2012). The lifecycle of project development tends to follow traditional/manual procedures. This nature of project management demands that employees must simultaneously work on multiple projects putting pressure on the workers to carry out their duties effectively. Project managers may find it difficult to track assigned responsibilities and targets about the project status. Poor planning and budget constraints lead to delays in the project start and completion times. Project resources and activities are often manually adjusted or rescheduled, as such projects are completed after deadlines. Complexity in manual operations leads to improper communication between project managers and the team members; workers may be assigned to the wrong tasks. Therefore, project activities require the use of advanced technology that supports the entire lifecycle of the projects for effective management. The adoption of information systems in an organisation is a function of management awareness and perceived usefulness. There is a need to ascertain the awareness of project managers or business owners on their adoption of project management information systems in project management and the influence of these systems on project outcomes.

II. RESEARCH METHODOLOGY

Structured questionnaire was used to collect data from 130 respondents with primary aim of investigating the adoption of PMIS tools in the management of projects and their significant influence on the project outcome. The most appropriate respondents are the key players and stakeholders in project management organizations including business owners and project managers. A suitable sampling technique was applied to ensure that only the relevant stakeholders are involved in the research process. Features of a PMIS such as project planning, control, utility, risk analysis, communication management and their Influences on project outcome were considered. Collected data were analysed quantitatively using statistics.

- *Respondents' Demographics*

Information from the respondents' demographics provides background information about the characteristics of the target population represented by the sample.

Characteristics such as gender, age, level of education and position in the organisation.

➢ *Gender*

A summary of the respondents' gender is shown in Figure 1. The figure provides information about the level of gender inclusion in the data collection process.

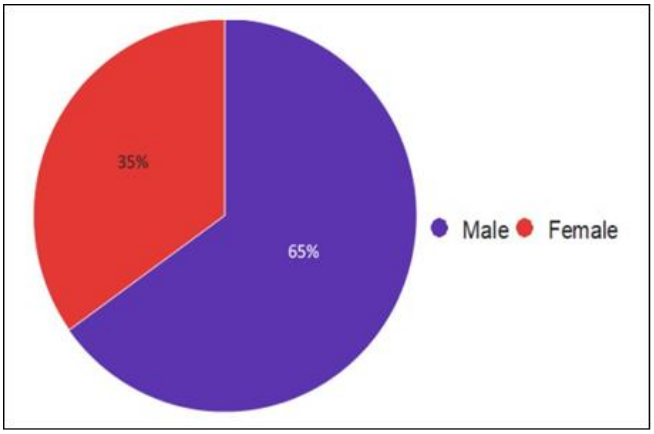

Fig 1 Respondents 'Gender

From the result in Figure 1, 65% of the respondents are males while 35% are females. Though this result implies an unbalanced proportion of females in the research process, it resonates with the representation of both genders in the management positions of most organizations.

➢ *Age*

The respondents' age distribution is presented in Table 1. This provides information on the frequency of the respondents in the different age groups of the population.

Table 1 Age Distribution of Respondents

Age	Number of responses	Percentage
20 - 25 years	10	8%
26 - 30 years	27	21%
31 - 35 years	32	25%
36 - 40 years	33	26%
41 - 45 years	14	11%
46 - 50 years	9	7%
> 50 years	1	1%
Total	**126**	**100%**

The summary of the respondents' ages shown in Table 1 indicates that 26% (33) of the respondents were between the ages of 36 to 40 years, 25% (32) were between the ages of 31 to 35 years, 21% (27) have their ages between 26 to 30 years, 11% (14) 8% (10) were aged between 20 to 25 years, 7% (9) were between the ages of 46 to 50 years, while 1% (1) was above 50 years old. 84% of the respondents fall between the ages of 26 to 45 years which indicates that majority of the project managers or business owners are relatively young, possessing greater tendencies to adopt information systems and technology in their operations.

➢ *Level of Education and Experience*

The adoption of PMIS demands the respondents have attained a level of formal education and experience. The respondents were asked to indicate their level of education, a summary of their responses is in Table 2.

Table 2 Respondents' Educational Level

Type	Frequency	Percentage
PhD	5	4%
Master's degree	46	37%
Graduate University	60	48%
Diploma	11	9%
School leaving certificate	2	2%
Total	**124**	**100%**

Majority of the respondents had formal education. Results from Table 2 indicates that 48% of the respondents were university graduates, 37% were master's degree holders, 9% had diplomas, 4% had Ph.D. degree and 2% had only secondary school leaving certificates. The educational level of these project managers implies that they are highly educated having been through at least a graded programme. They tend to possess the basic knowledge and skills required for the adoption of PMIS. These respondents occupy various positions in their organisations (Table 3). 43% of the respondents own the organisation, 15% were project managers, 12% were project leaders or directors 7% were top managers and 16% were architects, production technical operators, project assistants, sales specialists, or human resource managers.

Table 3 Respondents' Position in the Organization

Years	Frequency	Percentage
0 to 5 years	72	60%
6 to 10 years	35	29%
11 to 15 years	10	8%
16 to 20 years	4	3%
Total	**121**	**100%**

➢ *Adoption of Project Management Information System in the Organisation*

PMIS is observed to be adopted at various stages in project management. This study measured the respondents' experience with the use of these systems in their organisations. The result showed that 16% indicated the non-application of PMIS in the management of their projects (Figure 2) while others have various levels of PMIS adoption in their organisation.

ISSN No:-2456-2165

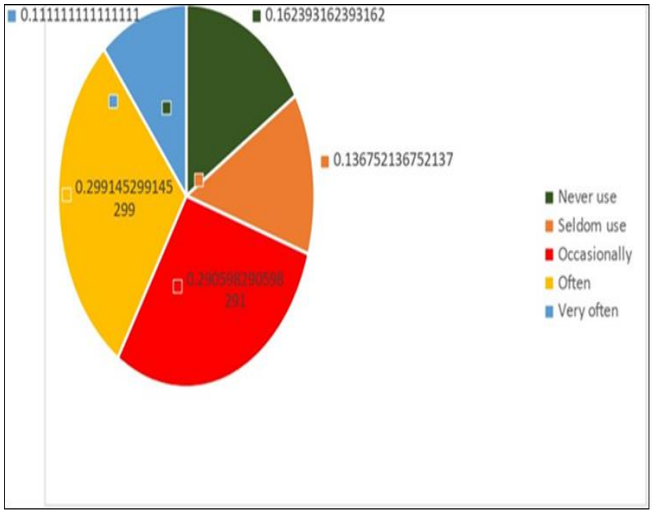

Fig 2 Frequency of PMIS Adoption

The respondents were asked to specify the PMIS applications they were most familiar with and adopted in their operations. A summary of their responses is displayed in Figure 3. Microsoft Project (69%) is the most adopted application while Podio is the least.

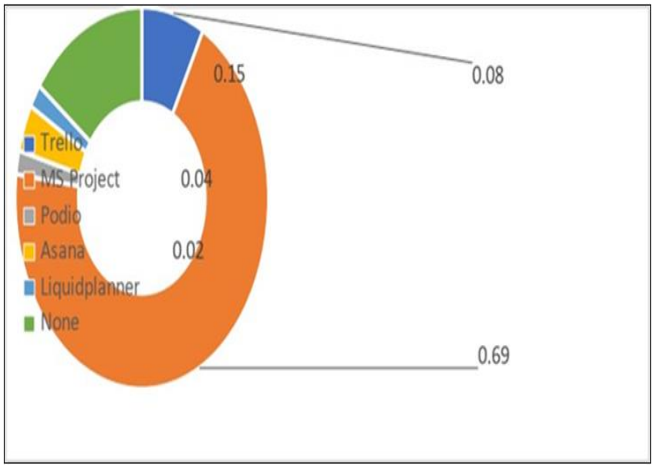

Fig 3 Project Management Applications

PMIS is adopted in the management of project risks. Table 4.16 shows the results of the responses of the respondents to their adoption of PMIS in the management of risks in their projects. Similar to the utility tools, with mean responses between 3.11 and 3.31, there is the occasional use of PMIS in the management of risk.

Table 4 Use of PMIS in Risk Analysis

Field	Min	Max	Mean	Standard Deviation
PERT	1.00	5.00	3.14	1.11
Simulation	1.00	5.00	3.22	1.14
Risk Management	1.00	5.00	3.29	1.13
Issue Management	1.00	5.00	3.31	1.10
Claim Management	1.00	5.00	3.11	1.02

With the adoption of the various PMIS tools in the management of the various stages of a project. The impact of PMIS on the outcome of projects in various organisations is shown in Table 5.

Table 5 The Influence of PMIS on Project Outcome

Field	Min	Max	Mean	Standard Deviation
Productivity Improvement	1.00	5.00	4.17	0.84
Quality of decision improvement	1.00	5.00	4.21	0.68
Reduced decision-making time	1.00	5.00	3.84	0.89
Task completion time reduction	1.00	5.00	3.84	0.92
Activity-control improvement	1.00	5.00	4.07	0.73
Activity-planning improvement	1.00	5.00	4.18	0.74
Project monitoring	1.00	5.00	4.19	0.78
Resource allocation efficiency	1.00	5.00	4.04	0.76
Project cost allocation	1.00	5.00	3.99	0.81
Project scheduling	2.00	5.00	3.99	0.66
Resource usage	1.00	5.00	3.97	0.78

III. DISCUSSION OF RESULTS

The findings signify the dominance of males (65%) over women (35%) in management positions. In developing nations like Nigeria, there is an unbalanced representation of the female gender in management positions. There is the obvious challenge of gender inequality in this region, most management positions are occupied by males. In terms of age distribution, the acceptance of information systems and technology appeals greatly to the younger generations. The findings of this study indicate that majority of the project managers or business owners are relatively young, 84% of the respondents were between the ages of 20 and 45 years. The younger generations possess a higher tendency to adopt the use of technology and information systems more than the older ones. The relative ease of technology usage resonates better with younger people than adults in their operations for project management. This agrees with the findings of (Charness and Boot, 2016) usage of technology among adults. They observed that the level of technology acceptance is influenced by age, the perceived advantage and difficulty using the technology among adults. This relative ease of use is also determined by the education and experience of the user. It can be deduced that there is a positive relationship between the age of the user and the perceived tendency to adopt the use of technology. Project manager practitioners must possess some basic forms of formal education. The educational level of a project manager is significantly influenced by the subjective norm which represents the individual's perception and regulates the desired behaviour. As noted by Lai (2017), the perceived image of technology usage is related to the degree of the ideation to which the technology is acknowledged to improve the status of the user in the context of the usage environment. The educational level of the project managers implies that they are highly educated with

high levels of educational qualifications. However, this raises a concern as observed by Ogunsanya, Aigbavboa and Thwala, (2016) that project management practices in developing nations continue to experience low levels of professionalism and deficiency in standard practice as well as technical incompetency. It appears that the level of education of the project managers in Nigeria is disproportionate to their level of adoption of PMIS. Only 16% of the project managers indicated the non-application of PMIS in their organisations. Due to the complex nature of most projects, the number of employees and the level of risk, the management of projects necessitates the application of advanced approaches for efficient planning, resource control and project monitoring to achieve the required project outcomes of high-quality and reduced negative occurrences. The most adopted application is the MS Project riding on the popularity of its parent brand name Microsoft which is widely available and used most especially in developing nations for almost free. In most organisations in Nigeria, there is occasional adoption of PMIS applications for managing the various stages of the project development from planning to evaluation. This occasional adoption portrays the low incorporation of IT systems in project management. Several factors are responsible for this low adoption of PMIS. The major factors are the lack of technical know-how and the high cost of these systems. Others such as the fear of failure trying to adapt to a new system, the difficulty in adjusting to a new routine or lack of confidence in information systems are significant factors. Developing countries are generally regarded as being poor and lacking the financial capacity to support sustainable projects suffering from resource constraints and management issues such as economic, human capacity and time restraints which are essential for project completion in agreement with the findings of Borstnar, Kobal and Ilijaš (2013). Most popular in this category is the occasional adoption of the Critical Path Method, Work Breakdown Structure, Gantt chart, Milestones, and Spreadsheet applications in the planning activities of project management. Unexpectedly, there is the occasional use of PMIS in project management despite the high-risk nature of projects in the country. This resonates with the constant failure breakdown or abandonment of most projects in this region as supported by the findings of Adams (2017). PMIS is observed to have a significant positive influence on expected project outcomes with a positive influence on improving the productivity of work, quality of decision, control of project activities and schedule, efficient allocation of resources and time management. With the use of PMIS planning, communication, reporting and utility tools, the project manager is equipped sufficiently to design an efficient system with increased capacity to manage the project appropriately for quality output. Unexpectedly, a negative contribution of the frequency of usage of PMIS tools on the project outcome is observed. The use of PMIS in the management of projects in developing nations tends to face operational difficulties, high expectations and overreliance as also observed by Vuksanović, Ugarak and Korčok (2016). These systems may be designed with an unwarranted emphasis on monitoring and reporting activities of the project with the tendency to over-rely on the technology for these activities rather than on the quality of information.

IV. CONCLUSION

Sustainable projects suffer from resource constraints and management issues. Economic, human capacity and time are essential resources for project completion. This complex nature and the constant failure of projects in developing nations require the adoption and use of PMIS at the different phases of the project. This requires the application of advanced approaches for efficient planning, resource control and project monitoring, to achieve the required project outcomes of high-quality and reduced negative occurrences. Several factors are responsible for the low adoption of PMIS. The major factors are the lack of technical know-how and the high cost of these systems. Other significant factors are the fear of failure trying to adapt to new systems, the difficulty in adjusting to new routines or lack of confidence in information systems. Developing countries are generally regarded as being poor and lacking the financial capacity to support. The relative ease of technology adoption is influenced by the age, education and experience of the user. The degree of technology acceptance in the operations of project management is observed to be higher in younger people than adults with the former possessing a higher propensity for technology and information systems. With the advancement in technology and globalisation of the world economy, organisations must take advantage of information systems. Organisations in developing nations must evolve to become technology-driven for better project outcomes.

REFERENCES

[1]. Adams, B.A. (2017) Project Management for Developing Countries: Back to Basics. Dama International Journal of Researchers (DIJR) [online]. 2 (4), pp. 5–9. Available from: www.damaacademia.com.

[2]. Borstnar, K.M., Kobal, V. and Ilijaš, T. (2013) Impacts of implementation of project management information system in a small R&D company-case study. In: 32. mednarodna konferenca o razvoju organizacijskih znanosti [online]. Available from: https://www.researchgate.net/publication/236656392. Đurković, O. and Raković, L. (2009) Risks in Information Systems Development Projects Management Information Systems. 4 (1).

[3]. Lai, P. (2017) The literature review of technology adoption models and theories for the novelty technology. *Journal of Information Systems and Technology Management*, 14 (1), pp. 21–38

[4]. Ogunsanya, O.A., Aigbavboa, C.O. and Thwala, D.W. (2016) Public-Private Partnership Infrastructure Projects in Developing Nations: Lessons for The Nigerian Construction Industry. In: *International Conference on Infrastructure Development in Africa*. South Africa, 477–486.

[5]. Vuksanović, D., Ugarak, J. and Korčok, D. (2016) Industry 4.0: the Future Concepts and New Visions of Factory of the Future Development. In: International Scientific Conference on ICT And E-Business Related Research [online]. Belgrade, Serbia, Singidunum University, 293–298.
[6]. Zuofa, T. and Ochieng, E.G. (2012) Towards the advancement of project management practice in developing countries: the case of Nigeria. In: PMI® Research and Education Conference. Munster, Ireland, PA: Project Management Institute.