

Network Analysis and Journal Publishing Project: A Case of Nigerian Journal of Business and Management Sciences of Department of Business Administration, Ambrose Alli University, Ekpoma

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Abstract: *The broad objective of this study was to present the relationships among the activities involved in the publication of the journal in focus by a network and develop a time schedule for the completion of the journal publishing project in focus by identifying the critical path. The study was anchored on Techno-structural change theory of Galbraith (1970). Survey research design was adopted for the study. Primary source of data were employed by the researcher. Interview was the instrument used to elicit information from the editor of the journal in focus. Tora software version 1.00 was used to analyze the collected data. Results obtained from the test of the formulated hypotheses revealed that the critical path using the optimistic time for the analysis is given thus: 1-2-3-5-6-7-8-9-10 (A-C-E-G-H-I-J-K)=6+2+1+2+4+3+1+3=22 weeks. Base on the findings, the researcher concluded that network analysis could have an effect on the journal publishing project of the journal in focus. Sequel to that, the researcher recommended that the editor of the journal in focus should regularly carryout a network analysis of the journal project in other to complete the journal production of various issues at the appropriate time.*

Keywords: Network analysis, critical path, optimistic time.

I. Introduction

The delay of journal publication houses/institutions has been a source of concern to academic/lecturers, individuals and policy makers. This unnecessary delay is very common here in Nigeria. The limited finance available to the publishing houses is often considered responsible for this challenge. However, there is always neglect of the influence of duration and timing to complete the different aspects of the journal publishing project and the whole project in general. This is the crux of this study. One crucial tool that could help in this regard is network analysis. Network analysis (NA) is a useful tool for planning and implementing management activities, enhancing optimum resource allocation as well as ensuring completion of tasks within a stipulated timeframe (Senthilnathan, 2020). The major focus of a network analysis is to establish a normal as well as minimum duration and cost. This technique help in minimizing waste and helps in advance in determining appropriate execution of activities in a complex project.

The basic design of network analysis was first introduced in the United Kingdom and in the United States of America in the mid-1950s. In 1958, Programme Evaluation and Review Technique was explored from network analysis by a team of Special Navy Project Office (Freeman, 2004). Generally speaking, network analysis could also be referred to and as Critical Path Analysis (CPA), Critical Path Method (CPM) and Programme Evaluation

and Review Technique (PERT). Therefore, network analysis is a technique for planning and controlling so as to facilitate the management of an organization. NA is very useful in implementing projects with different phases like journal publishing project. Network models are conventional means of finding the most skillful way to link a number of activities directly or indirectly in order to satisfy supply and demand requirements at different activity locations and project scheduling (Ajibade, Joshua &Chukwuekwu, 2021).

The need for networking arises in journal publishing projects to programme and monitor the progress of the stages involved so that the journal publishing project is completed in the minimum time. In doing this, it pin-points the part of the project that are crucial which if delayed beyond the allotted time would increase the completion time of the project as a whole. It further assists in allocating resources, such as labour and equipment and thus helps to make the total cost of the journal publishing project a minimum by finding the optimum balance between various costs and time involved (Gueret&Sevaux, 2002).

The researcher observed that the publishers of the Nigerian Journal of Business and Management Sciences find it difficult to publish journals at the stipulated time. This could be as a result of the failure of the editors and publishers to fully adopt the methodologies of network analysis (NA). This by extension could affect the completion time of the project. Though scholars like Adebowale and Oluboyede (2011) who studied network analysis and building projects in Ibadan, Ajibade, Joshua and Chukwuekwu (2021) who examined network analysis and accounting researches in a private university in Ogun, State, Nigeria have recommended an effective application of network analysis (NA) methodologies to projects, the publishers and editors of the journal in focus fail to understand this. This gives credence to this present study by the researcher. The objective of this study is to present the relationships among the activities involved in the publication of the journal in focus by a network and develop a time schedule for the completion of the journal publishing project in focus by identifying the critical path.

II. Review of Related Literature

Conceptual Review

Network Analysis

Network analysis (NA) is a quantitative tool used to enhance decision making process in an organization (Freeman, 2004). NA is applicable in different areas of study such as management sciences, medicine, project management, systems development, research and development, operations management and software engineering. NA ensures the efficient allocation and utilization of scarce resources so as to ensure an actualization of the desired goal by minimizing risk, ensure the completion of projects within the stipulated time frame. Large projects involving an enormous amount of capital such as human capital, financial capital, and other resources could be easily implemented to an optimum, when the methodologies of network analysis is fully utilized (Ajibade, Joshua &Chukwuekwu, 2021).

Some basic terminologies used in network analysis are activity, restriction, dummy activity, pre-requisite activity, post-requisite activity, descendant activity, a merge, pessimistic time, most probable time, optimistic time, free float, total float, earliest start time, latest start time, critical path (Ahuja&Orlin, 1993 as cited in Adebowale&Oluboyede, 2011).

Critical Path

The critical path of a network analysis gives the shortest time in which an entire project can be completed. Contained in it are activities that do not have positive float which is usually the longest path (Ahuja&Orlin, 1993 as cited in Adebowale&Oluboyede, 2011).

Optimistic Time

Optimistic time is referred to as the time required for the completion of an activity when every task progresses in an appropriate manner (Adebowale&Oluboyede, 2011).

Journal Publishing Project

Sharma (2020) sees journal publishing project as the rigorous process that brings about the publishing of scholarly works of different scholars. This process is a rigorous process that entails several activities. The activities involved includes the notification of scholars of available issues to be published, the collection, review and correction of articles by scholars in different fields of study, the collation and publishing of acceptable papers/articles. The stress involved in the entire journal publication process makes it a project.

Theoretical Framework

This study is fastened on Techno-structural change theory of Galbraith (1970). The proponent of this theory contends that change in an organization can be effected by reconfiguring the organization's technology, process and structure. Techno-structural change theory evolved from an examination of the factors considered to be key determinants of organizational work processes. Early theorist explained that organizational processes were largely a function of contextual factors such as organization size, environment, technology, or scale of operation (Cummings & Worley, 2010).

Techno-structural theory was developed based on studies showing that organizations that paid consideration to its work processes were more economically successful with flexible, organic organizational structures, while organizations who paid less attention to its work processes were less successful (Hammer & Champy, 2013).

This theory is relevant to this study because when the editors/publishers of the journal in focus take a critical look at the reconfiguration of its work processes, they would resort to the utilization of a technique like network analysis that could help ascertain the appropriate time required for the production of a journal issue.

Empirical Review

Adebowale and Oluboyede (2011) examined the cost and least expected time required to complete a building project. The data were obtained from ALMEGA, Nig. Ltd., a civil engineering company based in Lagos. Critical path method (CPM) and project evaluation and review technique (PERT) were used for the analysis. Findings revealed that the shortest possible time for the completion of the building project is 55 days instead of the expected duration of 92 days. The additional cost associated with the reduction in timing is N830,000.00 (\$5,355.00), which increases the initial expected cost required to complete the project from N3,290,000.00 (\$21,226.00) to N4,120,000.00 (\$26,581.00).

Carlos, Julio and Francisco (2017) examined network analysis as a management tool for inter-organizational project using Florianópolis technological complex, Brazil for the study. The study explored how the relationship between organizations could yield positive result. The relationship between these organizations was represented through a well-designed network diagram. Findings revealed that the critical path of the project has an effect on the completion time of a project.

Ajibade, Joshua and Chukwuekwu (2021) examined the applicability of social network analysis (SNA) to Accounting researches in a private University in Ogun State Nigeria to determine the quality of articles published in high impact journal outlet around the globe. A content analysis of publications in the google scholar of the individual researchers was conducted from the inception of the institution till date. The researchers were selected from the position of Lecturer 1 to the rank of Professor using a purposive sampling technique. The data gathered were analyzed through Social Network Analysis thereby presenting an adjacent matrix of collaborations existing among the scholars. The study also adopted a regression analysis so as to determine the extent of the impact of relationship between the researchers on their outcome. The study revealed that effective collaborations among the researchers has enhanced quality publications in high impact journal outlets around the globe which has increased both the individual global visibility as well as improvement on the University world ranking.

Ofualagba (2021) used social network analysis and educational data mining (decision tree method) to study the impact of communication networks, behaviour networks and the combination of these two networks on students' academic performance taking the role of factors like computer self-efficacy, age, gender into consideration. Findings of the study revealed a relationship between the studied variables.

Ekeh, Tsetim and Oguce (2019) examined the effect of networking on the performance of Small and Medium Scale Enterprises (SMEs) in Makurdi, Benue State. Survey research design was employed, a population of 708 owners/senior management staff of SMEs in Makurdi metropolis in Benue State, Nigeria were used for the study. Questionnaire was the data collection tool employed while regression analysis was used to analyze the collected data. Findings of the study revealed that network structure has significant effect on the performance of the studied SMEs in Makurdi, Benue State.

Gap in Knowledge

None of the empirically reviewed examined network analysis and journal publishing project using Nigerian journal of business and management sciences as a case study. Also none of the empirically reviewed examined the effect the critical path could have on the optimistic time of the studied journal using Tora software for the analysis. This is the gap in knowledge that this study seeks to fill.

III. Methodology

Research Design

Survey research design was used by the researcher. This was used because of the nature of the study.

Area of Study

The journal in focus ‘Nigerian journal of business and management sciences’ is published by the Department of Business Administration, Ambrose Alli University, Ekpoma, Edo State. The journal in focus is published bi-annually in March and September.

Instrument of Data Collection

Interview method was used to elicit the appropriate information from the editor in chief of the journal.

Method of Data Collection

On the spot method of data collection was used by the researcher to collect information from the editor of the journal.

Method of Data Analysis

TORA soft-ware version 1.00 was used to analyze the data collected by the researcher.

Data Presentation, Analysis and Interpretation

Data Presentation and Analysis

Table 1: Description of Activities involved in the Publication of the Journal in focus

Activity	Name of Activity	Preceding Activity
A	Call for papers	-
B	Receipt of articles from authors	-
C	Distribution of articles to reviewers base on area of specialization	A
D	Retrieval of corrected articles from reviewers	B
E	Sending of corrected copies to authors	C
F	Accepting of articles without corrections	D
G	Rejection of articles with corrections	E
H	Collation of articles	F,G

I	Editing of articles	H
J	Sending articles without correction to press	I
K	Collection/Distribution of Journal to contributors	J

Source: Field Survey 2023

Table 1 depicts the activities involved in the publication of a journal. It begins with activity A and ends with activity K.

Table 2: Activity, Preceding activity, Optimistic time, Most-likely time and Pessimistic time used to publish the journal in focus

Activity	Preceding activity	Optimistic time (Weeks)	Most-likely time (Weeks)	Pessimistic time (Weeks)
A	-	6	10	12
B	-	2	4	6
C	A	2	3	6
D	B	2	3	4
E	C	1	2	3
F	D	3	4	6
G	E	2	4	6
H	F,G	4	6	8
I	H	3	5	7
J	I	1	1	2
K	J	3	4	6

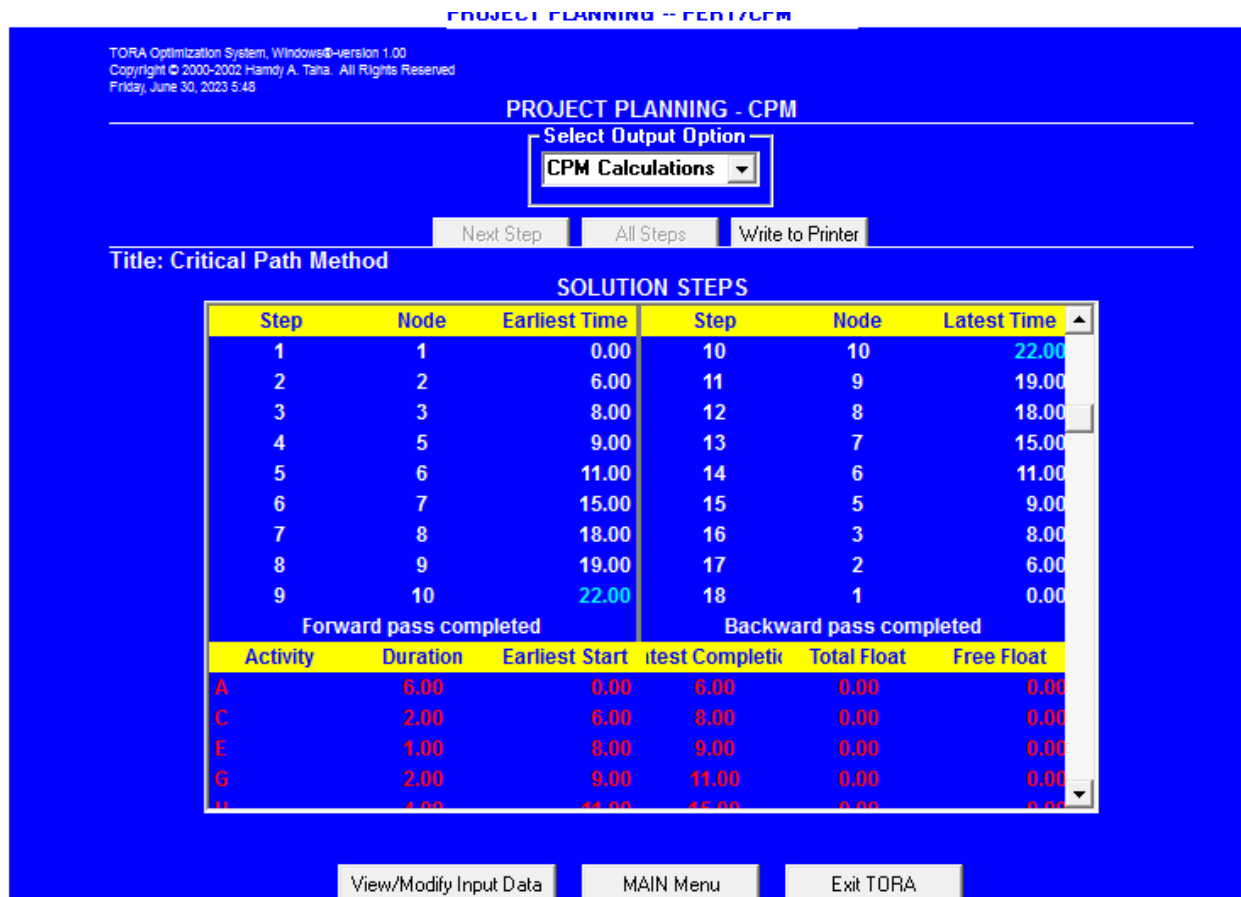
Source: Field Survey, 2023

Table 4.2 depicts the activities, preceding activity, the optimistic time to complete the project, the most likely time to complete the project and the pessimistic time to complete the project.

Test of Hypothesis

Ho: The critical path has no effect on the optimistic time of completing a journal publishing project.

Table 3: TORA Result Output



Source: TORA 1.00 Printout

The results from the output of TORA software version 1.00 reveals that the critical path using the optimistic time for the analysis is given thus: 1-2-3-5-6-7-8-9-10 (A-C-E-G-H-I-J-K)=6+2+1+2+4+3+1+3=22 weeks. In other words, the optimistic time required to publish and distribute a particular issue of the Nigerian journal of business and management sciences of the Department of Business Administration, Ambrose Alli University, Ekpoma is 22 weeks.

Discussion of Findings

Findings revealed that the critical path has an effect on the optimistic time of completing the Nigerian journal of business and management sciences of the Department of Business Administration, Ambrose Alli University, Ekpoma. This is in tandem with the study of Adebowale and Oluboyede (2011). They examined the cost and least expected time required to complete a building project in Lagos, Nigeria. Findings revealed that the critical path of the project has an effect on the shortest possible time for the completion of the building project. The work of Carlos, Julio and Francisco (2017) who examined network analysis as a management tool for inter-organizational project using Florianópolis technological complex, Brazil for the study also agrees with the findings of the study. Findings revealed that the critical path of the project has an effect on the completion time of a project.

IV. Summary, Conclusion and Recommendation

Summary

The results from the output of TORA software version 1.00 reveals that the critical path using the optimistic time for the analysis is given thus: 1-2-3-5-6-7-8-9-10 (A-C-E-G-H-I-J-K)=6+2+1+2+4+3+1+3=22 weeks.

Conclusion

The researcher concludes that network analysis could have an effect on the journal publishing project of the journal in focus. This is because the critical path of the project could have an effect on the optimistic time of completing the project.

Recommendation

Base on the findings of the study, the researcher recommended that the editor of the journal in focus should regularly carryout a network analysis of the journal project in other to complete the journal production of various issues at the appropriate time.

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