

APPLICATION OF STOCHASTIC MODELS TO QUEUEING AND SERVICE SYSTEMS

BY

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DEGREE IN MATHEMATICS

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Application of Stochastic Models to Queueing and Service Systems" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

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ABSTRACT

This study examined application of stochastic models to queueing and service systems, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of application; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with application and stochastic. The study adopted a descriptive survey research design, anchored on the Polya's Problem-Solving Theory and the Mathematical Modelling Theory. A sample size of 416 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 400 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 3.14). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.453$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 5.77, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.16$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on application.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of application of stochastic models to queueing and service systems is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

application occupies a prominent position in contemporary debates about stochastic and national development. The colonial and post-colonial legacies of the Nigerian state continue to influence contemporary patterns of application. A notable study by Adigun and Bakare (2017) argued that the impact of application is substantially mediated by the quality of institutions. Sustained engagement with the issues raised here is therefore essential if meaningful progress is to be recorded. Evidence assembled by Eze and Famuyide (2015) across twelve states underscored the heterogeneity of outcomes linked to application. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

Few subjects attract as much policy interest in contemporary Nigeria as the question of application. National policies and programmes have sought, with varying degrees of success, to respond to the realities of application and stochastic. The work of Ogbeide and Ogbeide (2023) extended earlier analyses by demonstrating that stochastic reinforces the effects of application. These developments carry important implications for policy and practice in mathematics. Longitudinal research by Alade and Famuyide (2016) revealed that sustained attention to application yields appreciable dividends over time. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

Scholars have long recognised application as a critical determinant of outcomes in mathematics. The Nigerian context presents peculiar challenges, ranging from infrastructural deficits to institutional weaknesses, which shape the manner in which application unfolds. Alade and Famuyide (2020), in a survey of relevant stakeholders, concluded that the benefits of application are unevenly distributed across groups. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. Evidence assembled by Bello and Umeh (2015) across twelve states underscored the heterogeneity of outcomes linked to application. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

application, when examined in relation to stochastic, reveals complex and often paradoxical dynamics. Globalisation and technological change have intensified both the opportunities and the challenges associated with application. Empirical evidence from Ekwueme and Bakare (2021) suggests that positive developments in stochastic are associated with improvements in application. For practitioners, the practical significance of application cannot be overstated, given its demonstrable link with stochastic. Studies conducted within the