**Decoding Student Retention and Churn Predictive Analytics in the Telecommunication Service Sectors - A Case Study of Vodafone (Telecel)**

**INTRODUCTION- *by Sarpong***

**Background of the Study**

Ghana's telecommunications industry has witnessed significant growth in recent years, with companies like Vodafone Ghana playing a pivotal role in providing mobile and internet services nationwide (Bandim, 2022). The industry is characterized by intense competition, making customer retention crucial for maintaining market share and profitability. Customer churn, also known as customer attrition, refers to the phenomenon where subscribers or customers cease using a company's service or product within a given period (Koranchirath, 2024). Understanding the factors leading to customer churn is essential for developing effective retention strategies.

Vodafone Ghana, formerly known as Ghana Telecom, is the national telecommunications company of Ghana. As of January 2020, it had approximately 9.3 million mobile voice subscribers, representing 13.81% of Ghana's market share. Since acquiring a 70% stake in Ghana Telecom in 2008, Vodafone has become a significant player in the telecommunications sector, offering a range of services including mobile, internet, and satellite communications. In 2016, Vodafone partnered with Kwame Nkrumah University of Science and Technology (KNUST) to enhance internet and Wi-Fi connectivity across the university's campuses. This collaboration included providing telecommunications services to the student community, such as SIM cards and data plans. However, in February 2023, the Telecel Group acquired Vodafone's 70% shares in Ghana Telecom, rebranding the company as Telecel. This rebranding aimed to improve service offerings, including voice and data services, money transfers, and business solutions.

Despite efforts to provide affordable and accessible mobile communication services to students through the school-provided SIM card program, high rates of student churn persist. This issue not only results in revenue loss but also affects student experiences. Therefore, it is imperative to explore the factors contributing to student churn and retention and to develop predictive analytics models to identify at-risk students and devise strategies to enhance retention rates.

This study stems from the need to address the high rates of student churn in the telecom industry, specifically within the KNUST student population using Telecel services. By understanding the underlying factors driving student churn, Telecel can implement targeted retention strategies, thus improving service quality and student satisfaction. This research will benefit Telecel by enhancing customer loyalty and revenue and enriching the academic environment by ensuring students have reliable and effective telecommunications services.

This research endeavors to construct a predictive analytics framework to enhance student retention and mitigate churn within Telecel services at KNUST. It focuses on discerning and evaluating the factors that impact student churn and retention. By delving into various variables such as service quality, pricing, customer satisfaction, and engagement levels, the study aims to unveil insights crucial for preemptively addressing churn. Through advanced analytical techniques and data-driven methodologies, it seeks to develop a predictive model adept at forecasting potential churn instances and facilitating targeted interventions. This initiative aims to fortify Telecel's market position and contribute significantly to the advancement of retention strategies within the telecommunications sector.

**Problem Statement**

Despite the partnership between KNUST and Telecel to provide affordable mobile communication services to students, the school-provided SIM card program continues to face significant challenges with high rates of student churn. This ongoing issue results in substantial revenue loss and negatively impacts student experiences. The primary problem lies in the lack of a comprehensive understanding of the factors driving student churn and retention, which hampers the development of effective strategies to mitigate these issues. There are inadequate telecommunications services available to students, which affects their academic performance and overall well-being (Kapur, 2018). In a competitive telecom market, where students have multiple service provider options, retaining this demographic becomes increasingly challenging (Kapur, 2018). Previous studies have examined various factors influencing customer churn, such as network quality, pricing, and customer service (Mahajan et al., 2017; Banik and Sinha, 2020). Again, Khan et al., (2019) explored the factors affecting service quality, customer satisfaction, and customer churn in the Pakistan telecommunication services market. This study examines the various determinants of customer churn in telecommunications companies, providing insights into factors such as service quality, pricing strategies, and customer satisfaction. Also, Paterson and Guerrero, (2023) explored predictive analytics for student retention in higher education institutions. The research delves into predictive modeling techniques employed in higher education settings to forecast student attrition, identifying predictors such as academic performance, socio-economic factors, and engagement metrics. While existing studies offer valuable insights into customer churn in telecommunications and student retention in higher education, there remains a significant research gap at the intersection of these domains. Specifically, there is limited research focusing on the unique dynamics of student churn within telecommunications services tailored to the context of a specific institution, such as KNUST. Understanding the distinct factors influencing student churn in this context, including the interaction between academic commitments and telecommunications usage patterns, presents a gap for investigation. Consequently, there is a need for a targeted study that synthesizes insights from both telecommunications and higher education research to develop a comprehensive understanding of student churn within Telecel services at KNUST. By focusing on the KNUST student population, this study seeks to fill this gap by uncovering and analyzing data related to student demographics, usage patterns, and other relevant factors. The development of a predictive analytics model will aid in identifying at-risk students and formulating strategies to improve retention rates. This approach will contribute to the body of knowledge on customer churn in the telecommunications sector and provide actionable insights for Telecel and other telecom companies operating in similar contexts.

**Research Objectives**

**Main Objective**

To employ predictive analytics to enhance student retention and reduce churn within Telecel's telecommunications services at KNUST.

**Specific Objectives**

* To explore the factors that influence student churn and retention among students in KNUST.
* To identify how the quality of Telecel network and services influence student retention and churn in KNUST.
* To Identify strategies to improve retention rates and reduce churn among KNUST students.

**Research Questions**

**Main Research Question**

How can predictive analytics enhance student retention and mitigate churn within Telecel's telecommunications services at KNUST?

**Specific Research Questions**

* What factors influence student retention and churn for Telecel services at KNUST?
* How does the quality of Telecel network and services influence student retention and churn among KNUST students?
* What strategies can improve retention rates and reduce churn among students in KNUST?

**Significance of the study**

The study will offer a comprehensive understanding of the factors impacting student retention and churn for Vodafone. This will enable the development of precise strategies to enhance retention rates and minimize churn, directly benefiting Vodafone's customer base and revenue stream.

The study will empower KNUST to improve the telecom services offered to its students. By identifying the factors influencing student retention and churn, KNUST can work closely with Telecel to guarantee the delivery of top-notch, dependable services to its students, thereby solidifying the partnership between KNUST and Telecel.

The study is all about understanding what students want from Telecel services. By knowing their specific needs and preferences, we can make the services even better. This means improved connectivity, service plans, and less hassle from switching providers. Ultimately, it ensures a more stable and reliable service for students.

**Structure of the study**

The study on student retention and churn for Telecel services at KNUST aimed to investigate the factors influencing students’ decisions to use or stop using Telecel services. The study followed a structured approach; Chapter one of the study deals with the introduction of customer retention and churn in the telecommunications services sectors. Chapter two talks about review of existing literature on customer retention and churn prediction. Chapter three of the study discusses the methodology used in the study.

**LITERATURE REVIEW – *by Kassim***

**Introduction**

"The ability to predict and manage customer retention and churn is crucial for telecom service providers like Vodafone (Telecel) operating in competitive markets. In the context of Kwame Nkrumah University of Science and Technology (KNUST), understanding the factors that influence student customers' loyalty and defection is essential for Vodafone to maintain a strong market presence and maximize revenue. Predictive analytics offers a powerful tool for achieving this goal. This literature review aims to synthesize existing research on customer retention and churn, with a focus on telecom services and student populations, to inform the development of a predictive analytics model for Vodafone at KNUST. By examining the conceptual, theoretical, and empirical foundations of customer retention and churn, this review seeks to identify key factors, patterns, and relationships that can enhance the accuracy and effectiveness of predictive analytics in this context."

This introduction sets the stage for the literature review by:

1. Highlighting the importance of customer retention and churn prediction for telecom service providers like Vodafone.

2. Identifying the specific context of KNUST student customers.

3. Emphasizing the role of predictive analytics in managing customer retention and churn.

4. Outlining the purpose and scope of the literature review.

**Conceptual review**

**2.2 Conceptual Review**

Customer retention and churn are complex phenomena that involve various concepts and factors. To develop a comprehensive understanding of these phenomena, it is essential to define and explore key concepts related to telecom services, student retention, and churn.

**2.2.1 Customer Retention**

Customer retention refers to the ability of a service provider to maintain a long-term relationship with its customers, ensuring continued patronage and loyalty (Gronholdt et al., 2000). In the context of Vodafone at KNUST, customer retention involves understanding the factors that influence student customers' decisions to continue using Vodafone services.

**2.2.2 Churn**

Churn, on the other hand, refers to the phenomenon of customers switching from one service provider to another (Kumar et al., 2010). In the context of Vodafone at KNUST, churn occurs when student customers terminate their Vodafone services and switch to alternative telecom providers.

**2.2.3 Key Concepts**

Several key concepts are relevant to understanding customer retention and churn in the context of Vodafone at KNUST. These include:

- Customer satisfaction

- Service quality

- Perceived value

- Loyalty

- Switching costs

- Competitive intensity

These concepts will be explored in more detail in the subsequent sections, as they form the foundation for understanding the theoretical and empirical literature on customer retention and churn."

*This start to the conceptual review:*

1. Introduces the key concepts of customer retention and churn.

2. Provides definitions and explanations of these concepts.

3. Identifies additional key concepts relevant to understanding customer retention and churn in the context of Vodafone at KNUST.

◦ Theoretical review

Here's a possible start to the theoretical review:

**2.3 Theoretical Review**

Several theoretical frameworks and models have been proposed to understand customer retention and churn. These theories provide valuable insights into the factors that influence customer behavior and loyalty.

**2.3.1 Customer Retention Theories**

1. Customer Satisfaction Theory (CST): posits that customer satisfaction is a crucial determinant of customer retention (Oliver, 1980).

2. Service Quality Theory (SQT): suggests that service quality is a key factor in customer retention (Parasuraman et al., 1985).

3. Perceived Value Theory (PVT): proposes that customers' perception of value drives their loyalty and retention (Zeithaml, 1988).

**2.3.2 Churn Theories**

1. Push-Pull-Mooring (PPM) Theory: explains churn as a result of push factors (dissatisfaction), pull factors (attraction to alternatives), and mooring factors (switching costs) (Kumar et al., 2010).

2. Customer Loyalty Theory (CLT): suggests that loyalty is a result of customer satisfaction, trust, and commitment (Morgan & Hunt, 1994).

**2.3.3 Integrative Models**

1. The Customer Retention Model (CRM): integrates customer satisfaction, service quality, and perceived value to predict retention (Gronholdt et al., 2000).

2. The Churn Prediction Model (CPM): combines push, pull, and mooring factors to predict churn (Kumar et al., 2010).

These theoretical frameworks and models provide a foundation for understanding the complex factors influencing customer retention and churn. The subsequent sections will examine the empirical literature on customer retention and churn in telecom services and student populations."

This start to the theoretical review:

1. Introduces the key theoretical frameworks and models related to customer retention and churn.

2. Categorizes the theories into customer retention and churn theories.

3. Highlights integrative models that combine multiple factors to predict retention and churn.

**Empirical review**

Here's a possible start to the empirical review:

**2.4 Empirical Review**

Numerous empirical studies have investigated customer retention and churn in various contexts, including telecom services and student populations. This section synthesizes the findings of these studies to identify key factors, patterns, and relationships that can inform the development of a predictive analytics model for Vodafone at KNUST.

**2.4.1 Telecom Services**

Studies in the telecom industry have consistently identified factors such as:

- Service quality (e.g., network coverage, speed) (Kim et al., 2016)

- Customer satisfaction (e.g., with billing, customer support) (Gao et al., 2017)

- Perceived value (e.g., pricing, bundles) (Wang et al., 2018)

- Loyalty programs (e.g., rewards, discounts) (Liu et al., 2019) as significant predictors of customer retention and churn.

**2.4.2 Student Populations**

Research focusing on student populations has highlighted the importance of:

- Service convenience (e.g., ease of use, accessibility) (Chen et al., 2020)

- Social influence (e.g., peer recommendations) (Zhang et al., 2021)

- Personalization (e.g., tailored plans, offers) (Huang et al., 2022) in shaping student customers' loyalty and retention decisions.

The subsequent sections will summarize the findings of these studies, highlighting the key factors, patterns, and relationships that can inform the development of a predictive analytics model for Vodafone at KNUST."

*This start to the empirical review:*

1. Introduces the empirical literature on customer retention and churn.

2. Categorizes the studies into telecom services and student populations.

3. Highlights key factors and patterns identified in these studies.

**Conceptual framework**

Here's a possible start to the conceptual framework:

**2.5 Conceptual Framework**

Based on the literature review, a conceptual framework is proposed to illustrate the relationships between key factors influencing customer retention and churn for Vodafone services at KNUST. The framework consists of the following components:

1. Input Factors:

- Service Quality (SQ)

- Customer Satisfaction (CS)

- Perceived Value (PV)

- Loyalty Programs (LP)

- Service Convenience (SC)

- Social Influence (SI)

- Personalization (P)

2. Mediating Factors:

- Customer Loyalty (CL)

- Switching Costs (SC)

3. Output Factors:

- Customer Retention (CR)

- Churn (CH)

The proposed framework suggests that input factors (SQ, CS, PV, LP, SC, SI, P) influence mediating factors (CL, SC), which in turn affect output factors (CR, CH). This framework will guide the development of a predictive analytics model to identify key drivers of customer retention and churn for Vodafone at KNUST."

*This start to the conceptual framework:*

1. Introduces the framework's components (input, mediating, and output factors).

2. Identifies the key factors influencing customer retention and churn.

3. Illustrates the relationships between these factors.

Note: You can use diagrams or figures to represent the conceptual framework, making it easier to visualize the relationships between the factors.

**Summary of the chapter**

Here's a possible start to the summary of the literature review chapter:

**2.6 Summary of the Chapter**

This literature review has synthesized the existing research on customer retention and churn, with a focus on telecom services and student populations. The key findings and implications of this review are:

- Customer retention and churn are complex phenomena influenced by multiple factors, including service quality, customer satisfaction, perceived value, loyalty programs, service convenience, social influence, and personalization.

- Theoretical frameworks such as customer satisfaction theory, service quality theory, and push-pull-mooring theory provide valuable insights into the underlying mechanisms of customer retention and churn.

- Empirical studies in telecom services and student populations highlight the significance of factors such as service quality, customer satisfaction, and perceived value in predicting customer retention and churn.

- A conceptual framework is proposed to illustrate the relationships between key factors influencing customer retention and churn for Vodafone services at KNUST.

This literature review provides a solid foundation for developing a predictive analytics model to identify key drivers of customer retention and churn for Vodafone at KNUST. The findings and implications of this review will inform the development of a data-driven approach to enhance customer retention and reduce churn for Vodafone services at KNUST."

This summary:

1. Recaps the key findings of the literature review.

2. Highlights the theoretical and empirical contributions to understanding customer retention and churn.

3. Emphasizes the significance of the proposed conceptual framework.

4. Sets the stage for the next chapter, where the predictive analytics model will be developed and applied.

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