**2.1 Introduction**

The widespread adoption of mobile technology has fundamentally reshaped how students connect, access information, and engage in learning activities (Alqahtani & Altarifi, 2020). Recognizing this shift, universities and telecommunication providers have collaborated to offer students special mobile phone packages. These packages often include subsidized SIM cards, bundled data allotments, and preferential call rates. One such example is the partnership between Kwame Nkrumah University of Science and Technology (KNUST) and Telecel (formerly known as Vodafone Ghana). Through this partnership, KNUST students receive Vodafone SIM cards upon admission, offering them a convenient and potentially cost-effective way to stay connected throughout their academic journey.

However, despite the potential benefits of these school-provided SIM cards, a significant issue of customer churn has been observed. Many students reportedly abandon using the Vodafone SIM cards in favor of their pre-existing mobile subscriptions. This phenomenon presents a challenge for both Vodafone and KNUST, as it undermines the intended benefits of the partnership and potentially disrupts students' communication and learning activities.

Understanding the factors influencing student retention and churn regarding these school-provided SIM cards is crucial. This knowledge can inform strategies for improving network provider offerings, enhancing student awareness of benefits, and ultimately fostering a more successful collaboration between universities and telecommunication companies.

This thesis aims to address this critical gap in knowledge by employing a survival analysis approach to investigate student retention and churn of Vodafone's school-provided SIM cards at KNUST. Survival analysis is a statistical technique particularly suited for analyzing data involving event occurrences over time (Box-Steffensmeier & Jones, 2020). In this context, the event of interest is student churn, defined as the discontinuation of using the Vodafone SIM card. By applying survival analysis, this thesis will explore factors that influence the duration of student usage of the school-provided SIM card, providing valuable insights into student retention patterns and churn drivers.

**2.2 Survival Analysis Applications in Customer Churn**

Understanding the factors influencing customer churn is crucial for businesses to develop effective retention strategies. Traditional churn prediction models often rely on classification techniques that categorize customers as churners or non-churners (Verma et al., 2020). However, these models fail to account for the crucial aspect of "time" in churn analysis. This section explores survival analysis, a powerful statistical technique particularly suited for investigating customer churn by considering the duration of customer relationships.

**2.3 What is Survival Analysis?**

Survival analysis, also known as time-to-event analysis, is a set of statistical methods used to analyze data involving the occurrence of events over time (Box-Steffensmeier & Jones, 2020). In the context of customer churn, the event of interest is customer discontinuation of service. Survival analysis allows us to estimate the probability that a customer will remain active with a company for a specific period (e.g., 6 months, 1 year) and identify factors that influence the duration of their customer relationship.

**2.4 Advantages of Survival Analysis for Customer Churn**

Survival analysis offers several advantages over traditional churn prediction models for investigating customer churn:

● Time Dimension: Survival analysis incorporates the crucial time element, allowing us to understand the likelihood of churn not just as a binary outcome but as a process that unfolds over time (Verma et al., 2020).

● Censored Data: In churn analysis, not all customers will churn within the observed time frame. Survival analysis can effectively handle "censored" data, where some customers haven't churned yet but are still under observation.

● Identifying High-Risk Customers: Survival analysis models can be used to identify customer segments with a higher risk of churn at specific points in their customer journey (Lee et al., 2018). This allows companies to prioritize retention efforts and target interventions towards high-risk customers before they churn.

● Understanding Drivers of Churn Duration: Survival analysis can reveal which factors not only influence churn likelihood but also the time it takes for churn to occur (Verma et al., 2020). This allows companies to tailor retention strategies based on the expected churn timeframe for different customer segments.

**2.5 Recent Applications of Survival Analysis in Telecommunications**

Several recent studies have successfully applied survival analysis to investigate customer churn in the telecommunications industry. These studies highlight the effectiveness of this approach in understanding customer churn dynamics and provide valuable insights for developing targeted retention strategies.

Lee et al. (2018): Identifying Key Drivers of Churn Risk

In their study titled "Predicting Customer Churn in a Telecommunications Company Using a Cox Proportional Hazards Model," Lee et al. (2018) employed a survival analysis model to predict customer churn in a telecommunications company. Their research focused on identifying factors that influence the likelihood and timing of churn.

The study utilized a Cox proportional hazards model, a popular technique in survival analysis, to analyze customer data. The model revealed that several key factors significantly contributed to customer churn risk. These included:

● Service quality metrics: Network coverage, call completion rates, impacting customer satisfaction and willingness to remain with the provider.

● Call charges: Customers on plans with high call charges were more likely to churn, suggesting a need for competitive pricing strategies.

● Customer satisfaction levels: Overall customer satisfaction with the service experience was a significant predictor of churn risk. Companies need to prioritize customer satisfaction to reduce churn.

By understanding these key drivers of churn risk, the telecommunications company could prioritize retention efforts and target interventions towards customer segments experiencing low service quality, high call charges, or dissatisfaction. This data-driven approach allows companies to improve customer lifetime value by mitigating churn and retaining satisfied customers.

**2.6 Research Gaps and Thesis Contribution**

While previous research has explored customer churn in the telecommunications industry and the application of survival analysis for churn prediction, there are key gaps in understanding student churn specifically related to school-provided SIM cards. This thesis aims to address these gaps and contribute valuable knowledge to this understudied area.

**2.7 Research Gaps**

Limited Research on Student Churn: Existing research on customer churn in telecommunications primarily focuses on general customer populations. Limited research specifically investigates student churn related to school-provided SIM cards. This thesis aims to bridge this gap by examining student churn behavior in this unique context.

Lack of Data on Student Usage Patterns: Understanding student preferences and usage patterns regarding school-provided SIM cards is crucial for developing effective retention strategies. However, data on student churn rates and usage patterns specifically for these SIM cards might be limited due to their proprietary nature within universities and network providers. This thesis acknowledges this challenge and will explore alternative data collection methods or utilize publicly available data on student mobile phone usage patterns, if feasible.

Uncertain Impact of School-Provided SIM Cards: The long-term impact of school-provided SIM cards on student learning, communication, and overall academic experience remains unexplored. This thesis can contribute by investigating potential associations between student churn and academic outcomes, if data permits.

**2.8 Thesis Contribution**

This thesis will address the identified research gaps by employing survival analysis to investigate student churn with school-provided SIM cards at KNUST. The specific contributions of this thesis are:

Understanding Student Churn Dynamics: By applying survival analysis, this thesis will estimate the probability of students continuing to use the school-provided SIM card over time. This will provide valuable insights into the duration of student usage and identify factors influencing when students are most likely to abandon the SIM card.

Identifying Key Drivers of Student Churn: This thesis will explore various factors potentially contributing to student churn, including service quality (network coverage, data allowances), price competitiveness compared to existing student plans, student awareness of benefits associated with the school-provided SIM card, and potential brand loyalty to existing providers.

Developing Targeted Retention Strategies: By understanding the key drivers of student churn and student mobile usage patterns, this thesis will inform the development of targeted retention strategies. These strategies can be implemented by universities and network providers to improve student adoption and utilization of school-provided SIM cards.

**2.9 Conclusion**

This research contributes to a more comprehensive understanding of customer churn in telecommunications by focusing on the understudied area of student churn with school-provided SIM cards. By applying survival analysis and exploring student-specific factors influencing churn, this thesis aims to provide valuable insights for developing targeted retention strategies, ultimately enhancing the effectiveness of university-telecom partnerships in providing mobile communication solutions for students.