Decoding Student Retention and Churn of Vodafone (Telecel) in KNUST

A Survival Analysis Approach

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OUTLINE

BACKGROUND OF STUDY

- The Ghanaian telecommunications industry, particularly Vodafone (now Telecel), faces significant challenges with customer churn. Retaining customers is crucial for profitability, especially in a highly competitive market where acquiring new customers is more expensive than retaining existing ones.
- Telecel, which acquired Vodafone in early 2023, aims to enhance service offerings and improve customer retention. The study focuses on understanding and addressing student churn at KNUST using survival analysis methods to develop strategies for reducing churn and improving customer satisfaction.

PROBLEM STATEMENT

- This research aims to investigate the factors contributing to student churn develop a survival analysis model for detecting at-risk students and design specific strategies to improve retention rates.
- It also seeks to enhance Telecel's services, improve student experience, and foster long-term relationships between Vodafone (Telecel) and KNUST.

RESEARCH OBJECTIVES

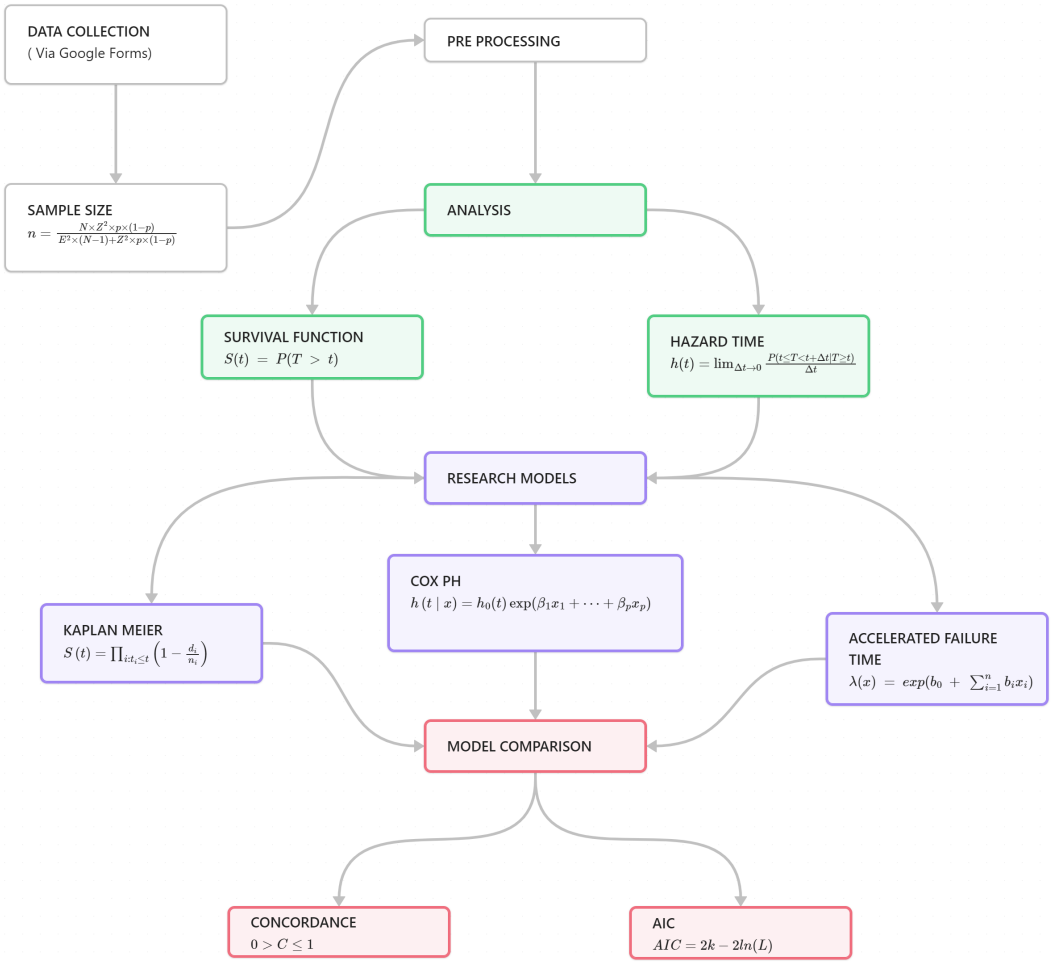
- Identify critical academic years when students are more likely to churn.
- Provide Telecel insights into students' churn patterns.

METHODOLOGY

- The data was collected via a survey, through Google Forms capturing specific aspects relevant to the study while ensuring confidentiality and ethical consideration
- Level 400 students in College of Science are the targeted audience.
- The sample size was determined through simple random sampling targeting approximately 338 students from a population of about 2835.

METHODOLOGY

Figure: Methodology



DATA DESCRIPTION

Variable	Description
Gender	Gender of the individual (Male/Female)
Churn	Whether the individual has churned (Yes/No)
Residence	Type of residence (Off-campus/On-campus)
Usage Frequency	Frequency of service usage
Network Strength	Strength of network (1 to 5)
Voice Calls	Usage of voice calls (Yes/No)
Mobile Data Internet	Usage of mobile data/internet (Yes/No)
SMS Text Messaging	Usage of SMS/text messaging (Yes/No)
Data Exhaustion	Whether data allowance is exhausted (Yes/No)
Other Networks	Use of other networks (Yes/No)
Poor Network Quality Coverage	Perception of poor network quality/coverage (Yes/No)
Unsatisfactory Customer Service	Perception of unsatisfactory customer service (Yes/No)
High Costs Pricing	Perception of high costs/pricing (Yes/No)
Monthly Data Usage	Monthly data usage category
Churn Level	Level of churn (1 to 3 if churned, 4 if not churned)

Figure: Description of Variables

DATA DESCRIPTION

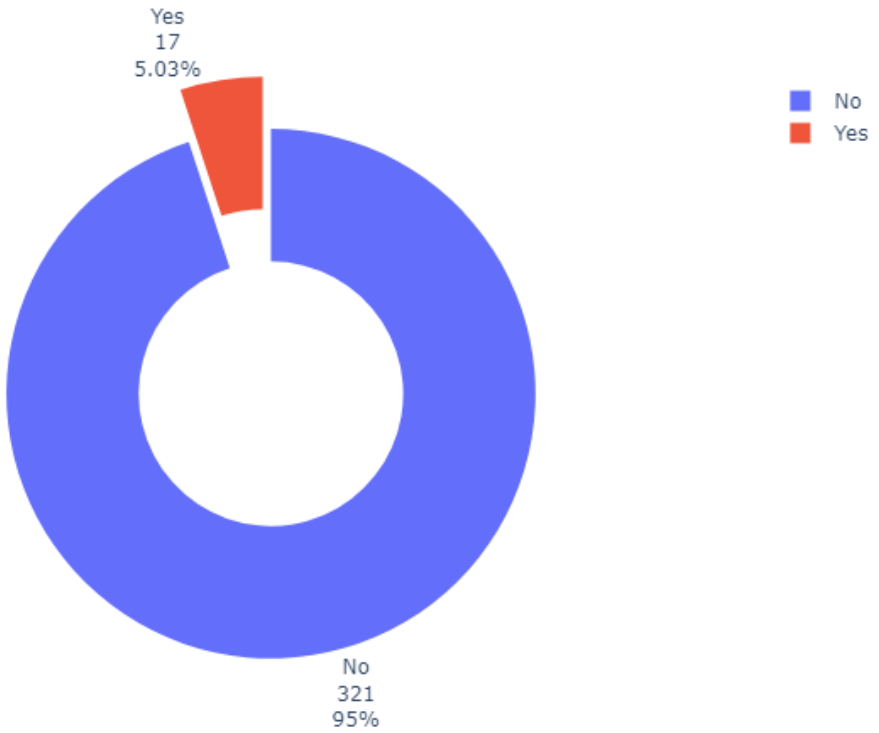


Figure: Churn Analysis

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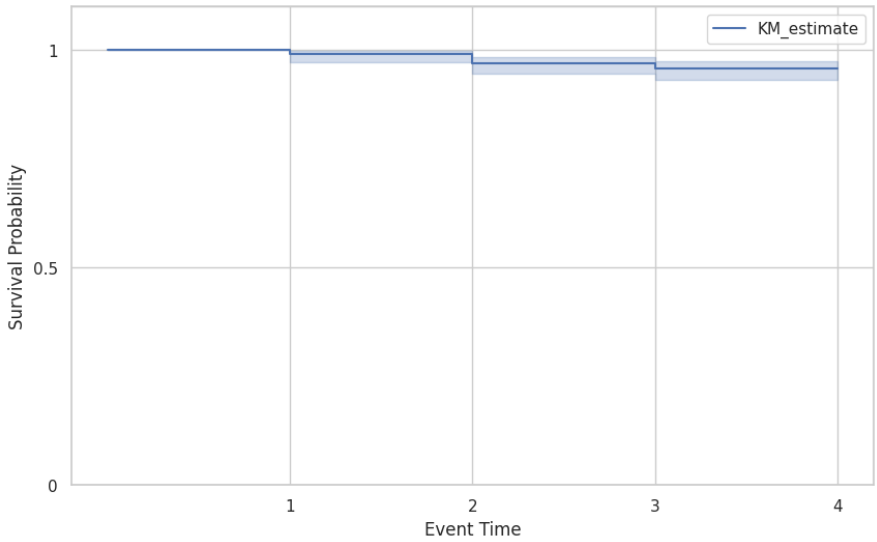

Figure: KM Curve

Event Time	Number of Individuals	Number of Events	Survival Probability	Lower CI	Upper CI
0	338	0	1.000000	1.000000	1.000000
1	338	3	0.991124	0.972736	0.997129
2	335	6	0.973373	0.949452	0.986056
3	329	3	0.964497	0.938330	0.979681
4	326	0	0.964497	0.938330	0.979681

Figure: KM Analysis

AFT Selection

Model	AIC	BIC	Hanna-Quinn
WeibullAFTFitter	182.568721	187.779061	32.486525
LogNormalAFTFitter	175.138211	180.348551	32.486525
LogLogisticAFTFitter	176.518119	181.728460	32.486525

Table: Model Comparison Metrics

Results:

The AFT model with the lowest AIC is: *LogNormalAFTFitter*
The AFT model with the lowest BIC is: *LogNormalAFTFitter*
The AFT model with the lowest Hanna-Quinn is: *WeibullAFTFitter*

ANALYSIS AND FINDINGS

Covariates	Cox PH (β)	P-value	LogNormal (β)	P-value
Gender	0.87	0.13	-0.493	0.267
Residence	0.69	0.27	-0.561	0.270
Usage_Freq	-0.10	0.60	0.106	0.439
Network_Strength	0.04	0.88	-0.093	0.605
Voice_Calls	-0.63	0.28	0.556	0.214
Mobile_Data_Internet	0.64	0.55	-0.462	0.534
SMS_Text_Messaging	0.21	0.71	-0.095	0.819
Data_Exhaustion	-1.34	0.02	1.031	0.035
Multiple_Networks	0.57	0.59	-0.354	0.636
Poor_Network_Quality_Coverage	0.95	0.16	-0.413	0.368
Unsatisfactory_Customer_Service	-0.62	0.31	0.458	0.314
High_Costs_Pricing	0.49	0.41	-0.375	0.393
Monthly_Data_Usage	0.03	0.92	-0.001	0.996
Intercept	-		4.388	0.007
sigma_Intercept	-		0.421	0.082

Figure: Cox and Lognormal Analysis

ANALYSIS AND FINDINGS CON'T

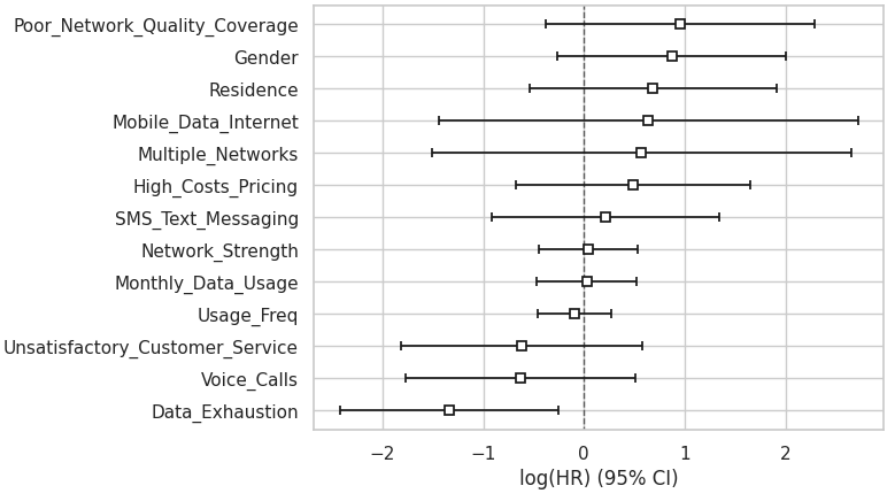

Figure: Cox Coefficients

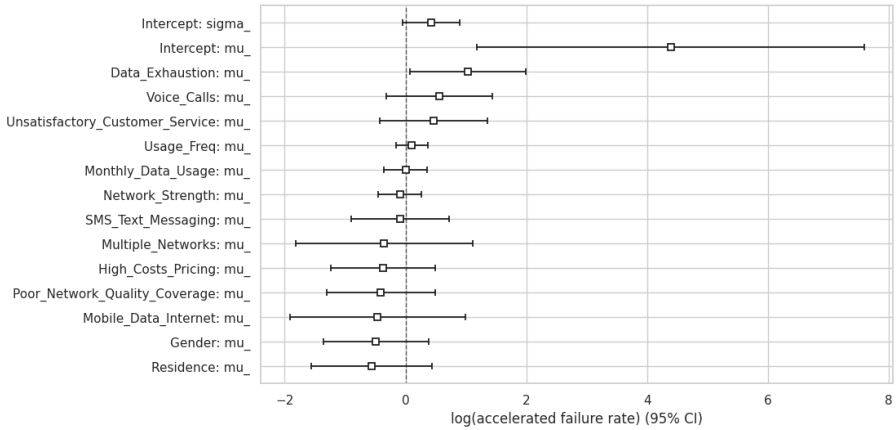

Figure: LogNormal Coefficients

MODEL COMPARISON

Model	Concordance	AIC
LogNormal	0.767	169.052
Cox PH	0.74	174.41

Table: Model Concordance and AIC values

SUMMARY OF FINDINGS

- The research shows that Lognormal AFT is the best model for both prediction and fit.
- Poor Network Quality is the covariate that tends to increase the rate at which students churn the most while Residence increase the time to the event of churn happening the most.
- Data Exhaustion is the covariate that is most significant to the study.
- Students tend to churn at the end of their second year.

SUMMARY OF FINDINGS CON'T

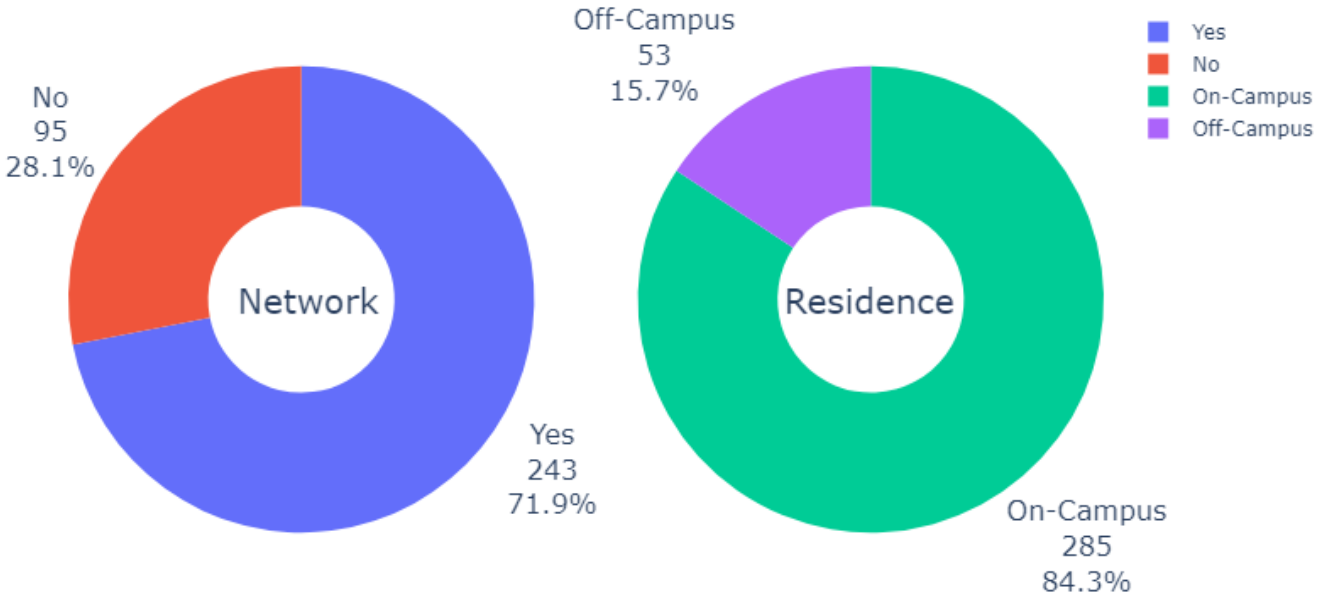

Figure: Poor Network and Residence Distributions

RECOMMENDATIONS

- Conduct regular surveys.
- Enhance the quality and reliability of network coverage across KNUST to reduce churn rates.
- Improve the responsiveness and quality of customer support to address student concerns more effectively.

CONCLUSION

THANK YOU