Churn analysis for churches using Rock RMS (Records Management System)

By Andrew Ferreira

Introduction

A follower of Jesus Christ, also known as a Christian, believes in everything described in the Bible because of the idea that God himself inspired people to write this book so humanity would know how to have a relationship with him and make the most out of their lives. Throughout biblical history, God attempted multiple times and with different strategies to have relationships with humanity, but because of human nature, they rejected God in many ways. Still, one of its teachings is that God, the creator of the universe, has a perfect plan for every individual on Earth, not leaving room for odds or coincidence and that God created the church, a place for Christians to have community and help each other to keep their relationship with God. With that in mind, Figure 1 raises an interesting question: why would God create a data scientist at this stage of humanity? A stage where data drives many decisions in the world and a stage where the world population is bigger than ever before. A fellow Christian might conclude that God strategically placed him or her in this era with these skills so they would help God to bring more people to church so they can develop the so desired relationship with him.

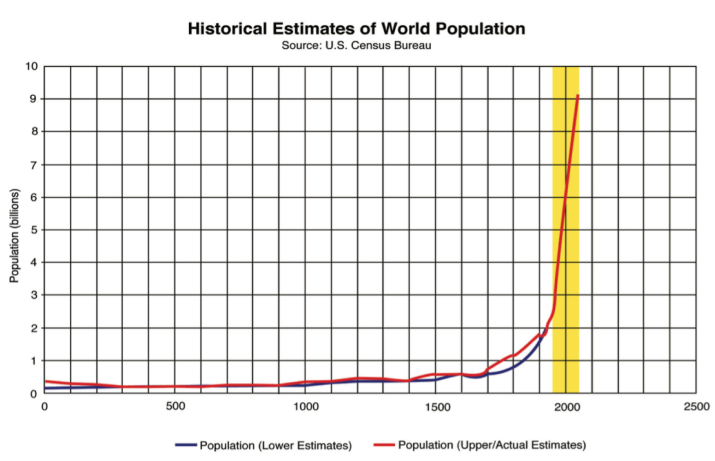

Figure 1 – Historical Estimates of World Population

Topic Description

Churches are growing, and it is becoming harder for church leaders to know the name and spiritual journeys of church members. With that problem in mind, developers created different systems to assist leaders in managing their members. One popular and free solution is the Rock RMS[1]. Rock is an open-source solution used by hundreds of churches worldwide that helps to track and manage the relationship between the church and its members by tracking common life events and demographics such as marriage, graduation, birthdays, address, and more. It also helps track religious events, known as "next steps," such as attendance, financial transactions, volunteering, baptism, joining a small group, and more.

As soon as a church installs Rock RMS, a problem is fixed: now they have data and means to know their members and help them grow spiritually. Finally, they can work on campaigns to invite more people to attend their church because it seems like they can easily measure growth by tracking the number of new accounts, new attenders, new givers, and new volunteers. However, a different problem emerges: there is too much data, and having a normalized database makes it harder to grasp data insights. This structure requires a data specialist to wrestle with the data, query the database, and answer, with data, questions worth asking. The problem is that very few churches will have a professional who knows SQL and statistics to dig into the tables and find answers. **This project aims to create a churn analysis framework using Rock RMS core tables from a church that uses the system as a case study.**

Motivation

Statistics and Computer Sciences are tools to serve other fields and answer complicated questions. An example that illustrates this point very well is the development of L-Systems in Computer Science. Lindenmayer, a biologist, led the development of "The Algorithmic Beauty of Plants,"[2] an algorithm that helps study cellular automata, a computer science subject that now creates Mondrian paintings on the internet[3]. This project will explore using statistics, algorithms, and churn analysis in a unique industry. A quick search for similar terms to "churn" and "church" on databases such as EBSCO and ScienceDirect keeps returning the same outcome: "No results were found." There is room to contribute to the field using well-known techniques for a not-yet-explored industry.

Research Description

This project will use a multi-site church as a case study. This church started using Rock RMS in 2018, and it currently has 43 campuses distributed across the United States, with an average (mean) attendance count in 2022 of 67,320 per week across all the campuses and its online platform. This number is collected by manually counting the number of people on every campus, but this information is not on Rock. An attender can record attendance on Rock RMS by checking in in the app, checking in as a volunteer, or leaving their children in the kid's ministry. The average (mean) attendance recorded on Rock is 36,069 per week in the same period. Because this project aims to build a framework for other churches to use, only recorded attendance on Rock will be used. Still, it is important to mention the discrepancy because it reinforces the need of inviting people to use Rock RMS as much as possible and the discrepancy reveals the attender anonymity that might be a challenge to overcome or accept throughout the analysis.

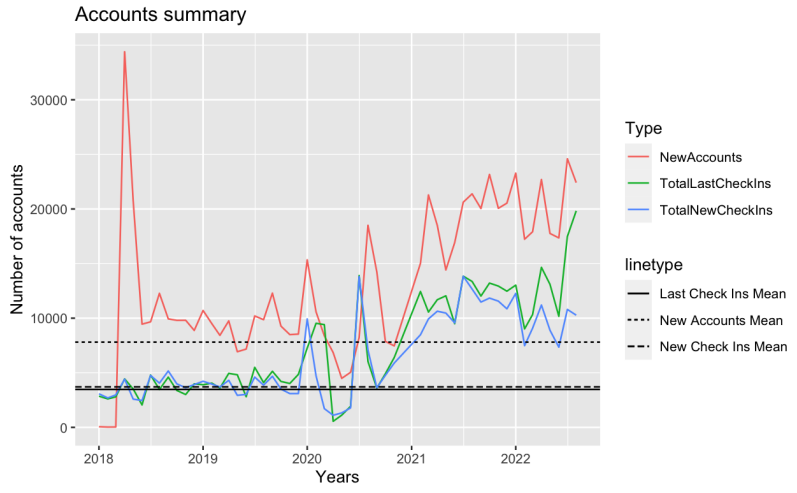

Figure 2 – Account summary

Throughout the years, this church created over 1.7 million Rock accounts, but only 947,577 currently have some attendance recorded on Rock. Figure 2 shows the number of new accounts being created over time since the implementation of Rock RMS and the number of new recorded check-ins and last check-ins. While the last check-in might not mean that a person is no longer attending the church, it is the starting point for the churn analysis. Figure 2 also helps grasp some initial insights:

New accounts per month: mean 7806, median 6069
New check-ins per month: mean 3706, median 2934
Last check-ins per month: mean 3473, median 2150

Many questions can be asked just by looking at these numbers, such as:

- What is the best metric to measure growth?
- Is retention canceling growth?
- Can we identify patterns that lead to retention?
  - if so, what are they?
  - and, how many check-ins are necessary to retain a member?
- Can we identify churn patterns?
  - If so, can we predict churn?
- How does next steps impact retention?

This project will conclude by answering these questions and delivering the queries used so other churches can use them to evaluate themselves. If a statical model can predict churn, the source code of this model will also be in the deliverables.

Subject Matter Expert (SME)

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[1] www.rockrms.com

[2] Françon, J. (1997, January). The algorithmic beauty of plants. Plant Science, 122(1), 109–110. https://doi.org/ 10.1016/ s0168-9452(96)04526-8

[3] fronkonstin.com/2022/03/25/the-mondrianomies/