Business Requirements Document

TechFlow SaaS Subscription Analytics Project

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1. Executive Summary

This project aims to build a comprehensive analytics platform for TechFlow, a SaaS company offering subscription-based software products. Using a MySQL database and synthetic data generation, the goal is to enable advanced SQL analytics for customer behaviour, subscription patterns, revenue analysis, and churn prediction.

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2. Project Objectives

- Design a normalized MySQL database schema to model users, subscriptions, products, payments, and usage data.
- Generate realistic synthetic datasets of over 1 million records using Python and Faker.
- Develop 20 thoughtfully crafted SQL business problems progressing from basic to advanced analytics.
- Provide clear documentation and explanation of queries for portfolio presentation and interview readiness.

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3. Needs Statement

TechFlow requires an advanced data analytics foundation to understand customer lifecycle, product adoption, retention, and revenue streams. Accurate and scalable SQL queries will drive data-driven decisions to optimize growth and reduce churn in the competitive SaaS market.

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4. Project Scope

- Build and deploy MySQL schema to store SaaS subscription and user engagement data.
- Generate extensive synthetic data reflecting realistic SaaS business operations.
- Create business-driven SQL problem sets to elucidate core insights.
- Fully document the project with explanations for both technical and business stakeholders.

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5. Business Requirements

- Analyze user distribution by demographics and industry.
- Monitor subscription metrics including signup trends, plan popularity, and churn rates.
- Evaluate revenue in aggregate and by product tier.
- Track user activity to measure engagement and feature usage.
- Support performance at scale with efficient query design for 1M+ records.

6. Business Problems

List of All Business Questions:

1. How many users do we have in each country?
2. What's the total monthly revenue for each subscription plan type?
3. Which products are included in the most subscriptions?
4. What's our payment success rate by payment method?
5. What's the average session duration and activity count by activity type?
6. Calculate the lifetime value for each customer based on all their payments.
7. Show monthly subscription growth trends over the past 2 years.
8. Which products are most commonly purchased together?
9. Identify users at risk of churning based on activity patterns.
10. Analyze revenue retention by monthly user cohorts.
11. Segment customers based on Recency, Frequency, and Monetary value (RFM Analysis).
12. Create a comprehensive product performance report with growth metrics.
13. Analyze the complete subscription lifecycle from start to churn.
14. Attribute revenue to specific products and analyze cross-product impact.
15. Prepare feature dataset for churn prediction modeling.
16. Create a comprehensive customer scoring system with multiple weighted factors.
17. Perform detailed cohort analysis with retention curves and statistical significance.
18. Build a revenue forecasting model considering seasonal patterns and trends.
19. On average, how long does it take users to make their first payment after subscription? *(Use updated query to avoid negative results)*
20. Map and analyze the complete customer journey from acquisition to potential churn**.**

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7. Key Stakeholders

- Business Analysts: Consume analytics to improve KPIs.
- Product Managers: Prioritize features and retention campaigns.
- Sales & Marketing Teams: Target customer acquisition and upsell.
- Data Engineers: Maintain data pipelines and schema integrity.

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8. Assumptions

- Synthetic data will approximate real SaaS behavior patterns adequately for testing.
- Users have SQL basics to understand and extend the queries.
- Environment includes MySQL Workbench and Python 3 with Faker installed

9. Success Criteria

- Fully functional database schema matching the SaaS domain.
- Generation of realistic, volume-scaled data supporting all queries.
- Accurate and performant execution of all 20 business problems.

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10. Glossary

- Subscription Lifecycle: Start, renewal, and churn of user subscriptions.
- Churn Rate: Percentage of customers cancelling their subscriptions.
- MRR: Monthly Recurring Revenue from subscriptions.
- User Engagement: Metrics like login frequency and feature usage.