



Sign-Up Flow Optimization with SQL & Tableau

How Data Revealed the Hidden Frictions Behind User Registration Drop-Offs

Introduction

Every online platform dreams of frictionless sign-ups — yet, subtle UX issues can quietly erode conversion rates.

At **365 Company**, the data team suspected that their registration funnel — which allows users to create accounts via **Google, LinkedIn, Facebook, or Email** — had hidden pain points.

In this project, we used **SQL** and **Tableau** to uncover exactly where users were struggling, quantify those drop-offs, and design **data-driven experiments** to optimize the entire sign-up experience.

Objective

To identify and quantify the obstacles in 365's sign-up process and propose optimizations to **increase the visitor-to-free-user conversion rate**, while maintaining a seamless experience across devices and platforms.

The Problem

Despite the introduction of multiple login options and social sign-up choices, conversion growth had stagnated.

The business wanted to understand:

- Where do users drop off during sign-up?
 - Which sign-up methods are failing most often?
 - How does device type (desktop vs mobile) impact completion?
 - Are social sign-ups truly reducing friction?
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Data Source

We analyzed **real website interaction logs** from 365's registration system. Each record contained:

Column	Description
visitor_id	Unique user session
device_type	Desktop or Mobile
os	Operating System (Windows, Android, iOS, macOS)
signup_method	Google, LinkedIn, Facebook, Email
event_type	Attempt, Success, Error
error_code	Error category (invalid email, popup closed, unknown, etc.)

Methodology

We structured the project into five main analytical phases:

1. **Data Extraction (SQL)** – Queried sign-up, success, and error events by method, OS, and device.
 2. **Exploratory Analysis** – Calculated failure rates, retries, and user behavior patterns.
 3. **Visualization (Tableau)** – Built an interactive dashboard to display conversion funnels and error distributions.
 4. **Hypothesis Testing (A/B Framework)** – Proposed and modeled experiments to validate potential UI changes.
 5. **Business Reporting** – Synthesized insights into an actionable strategy for product and growth teams.
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Step 1 – Current State of Sign-Up Performance

The analysis revealed several key metrics:

- ◆ **Device Comparison**
 - **Desktop sign-up fail rate:** 1.16%
 - **Mobile sign-up fail rate:** 3.24%

Mobile users were **3x more likely to fail** during sign-up, indicating usability issues on smaller screens.

◆ Sign-Up Method Performance

Method Success Rate Fail Rate

Method	Success Rate	Fail Rate
Google	91%	3.2%
LinkedIn	87%	–
Facebook	69%	7.6%
Email	65%	6.2%

- **Google** emerged as the most reliable and widely used method.
- **Email** had the lowest success rate, with **25% login failures** afterward.
- **Facebook** was less popular and experienced a higher rate of unknown technical errors.

⌚ Step 2 – Deep Dive: Mobile & Email Failures

When segmenting by **device and error type**, we uncovered that:

- 85% of all email errors came from **mobile users**.
- The main problem? **Entering email text correctly** on small screens.
- 1,273 out of 1,508 email failures originated from mobile devices.

Common issues included truncated text fields, auto-correct errors, and complex password rules.

🔍 Step 3 – Root Cause Analysis

- **778 users** closed the **Google OAuth pop-up** before completion (an external interaction problem).
- **349 Facebook users** faced “unknown” errors, suggesting inconsistent API responses.
- On Android, both success and failure rates were high — indicating users often retried successfully after one or more failed attempts.

 **Step 4 – Business Objective**

“Maintain steady growth by increasing the pool of free users — boosting the visitor-to-free-user conversion rate.”

We defined this as the primary KPI for the optimization initiative.

 **Step 5 – Hypothesis**

Highlighting social media sign-up options on the webpage will increase visitor-to-free conversion rates by reducing friction during registration.

The hypothesis rests on **user psychology** — users trust familiar login buttons (like Google or LinkedIn) and prefer fewer form fields.

 **Step 6 – Opportunity Sizing**

If the platform achieves a **10% lift** in visitor-to-free conversion:

Metric	Value
Current Conversion	3.2%
Target Conversion	3.52%
Additional Free Users	+3,587
Additional Paid Users (per 10K visitors)	+14
Estimated Added Revenue	\$420 per 10K visitors

Over millions of visitors, this represents **tens of thousands in incremental revenue**.

 **Step 7 – A/B Test Framework**

Parameter	Description
Experiment Goal	Measure conversion lift after highlighting social logins
Test Type	A/B parallel test
Metric	Visitor → Free User conversion
Baseline Conversion (p_0)	3.2%

Parameter	Description
Target Lift (MDE)	+10%
Significance (α)	0.05
Power (1–β)	0.8
Sample Size Estimate	~50,000 visitors per group

We would randomize users between the current layout (Control) and a new layout (Treatment) that promotes Google and LinkedIn sign-ups.

Step 8 – Key Findings Summary

Area	Problem	Impact	Recommendation
Mobile Email	Input errors on small screens	85% of email errors	Simplify email field, add auto-validation
Password Rules	Overly complex	Drop-offs in email sign-up	Reduce requirements, enable strength indicator
Social Sign-Up Visibility	Low	Users default to error-prone email form	Promote Google & LinkedIn sign-up
Facebook Flow	“Unknown” errors	Lower sign-up success	Audit API + error logging
Google OAuth	Premature pop-up closure	778 failed sessions	Add instructions or in-page sign-up fallback

Step 9 – Actionable Recommendations

1. Enhance Mobile UX:

Simplify email forms, use input masks, and optimize for small screens.

2. Promote Reliable Sign-Ups:

Highlight Google and LinkedIn buttons prominently above the fold.

3. Optimize Email Flow:

Reduce password restrictions and streamline reset flow.

4. Fix External Integrations:

Investigate Facebook “unknown” errors and OAuth pop-up handling.

5. Run Controlled A/B Tests:

Validate that UI changes deliver statistically significant conversion improvements.

Step 10 – Tableau Dashboard Highlights

To communicate findings effectively, an interactive **Tableau dashboard** was built featuring:

- **Funnel Visualization:** Visitors → Sign-Up Attempts → Successes
- **Device Comparison:** Mobile vs Desktop fail rates
- **Sign-Up Method Performance:** Success/failure ratios by method
- **Error Breakdown:** Top 10 failure codes and their frequency
- **A/B Simulation:** Expected lift and revenue scenarios

(Insert screenshots or Tableau Public link here)

Step 11 – Business Impact

This analysis equipped product managers and UX designers with **quantitative clarity** on where sign-up friction occurs.

By implementing the prioritized recommendations:

- Conversion rates are expected to increase by **10–12%**.
- User satisfaction and completion time are projected to improve.
- Estimated revenue gains could reach **>\$400 per 10K visitors** — scaling significantly with platform traffic.

Lessons Learned

- **Data storytelling drives action:** Clear visuals and concise explanations turn SQL results into business strategy.
- **Means aren't enough — segment deeply:** Device and method segmentation revealed hidden friction.

- **A/B testing validates assumptions:** Hypothesis-led design changes ensure confidence before rollout.
 - **UX optimization = business growth:** Improving sign-ups directly boosts lifetime revenue.
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 **Tools & Skills**

Tools: SQL · Tableau · MySQL Workbench · Excel

Skills: Funnel Analysis · Data Visualization · A/B Testing · Statistical Analysis · Business Intelligence · UX Analytics

 **Conclusion**

The **Sign-Up Flow Optimization Analysis** transformed scattered registration data into **actionable insights** that directly inform growth strategy.

By identifying friction points, quantifying their impact, and validating hypotheses with data, the company can now make **data-driven UX decisions** — turning more visitors into active users and more users into paying customers.