Signup Flow Optimization Using SQL and Tableau

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In this case study, we conduct signup flow optimization analysis using KPIs such as signup rate and visitors-to-registered conversion rate, utilizing SQL and Tableau on real-time data.

1. What is a signup flow?

A signup flow, also known as a registration flow, is the series of steps a user goes through when creating an account on a website or app. It typically includes components such as a registration form, captcha or security measures, email verification, and welcome screens or an onboarding process.

2. Why Signup flow optimization is important?

Let's take an example from everyday life. After a long day at work, Shon (a fictional character) comes back home craving some pizza. It is late, and he is too tired to cook, so he takes his phone and starts searching for nearby delivery places. He finds an incredible restaurant that allows Shon to create his own custom pizza by adding ingredients he wishes. Shon chooses what he likes, adds it to his virtual basket, and clicks the "Order Now" button. But wait! he must complete a registration form to finalize the order.

Figure 1

But the signup window is small and not user-friendly as shown above. After some struggle, he fills in all the details and clicks "Sign Up," but an error pops up saying the password doesn't meet requirements such as uppercase letters, numbers, symbols, length, and other additional criteria. To fix it, he goes back to the signup window, and now, guess what! all the fields are blank. He needs to fill out the entire form again. Now he is not only hungry but also angry and disappointed with the tool provider. He will never go back again, and the restaurant has lost one potential customer if they had analyzed the problems faced by user while using the website they can improve user acquisition.

3. Get to know about website and current registration process

In this case study, we will explore Learner-Point's current signup and login situation and identify possible areas for improvement.
Before diving in, let's take a brief tour of the webpage. Learner-Point is an online learning platform providing technical education courses. Its functionality includes lessons, quizzes, exercises, exams, CourseNotes, gamified features, and news feeds. The registration process is free and requires no debit card or payment method, but to have complete access to all features, one needs a paid account.

Web page provides following ways to sign up

1. Email ID with name and password
2. Social accounts such as Google, Facebook, LinkedIn

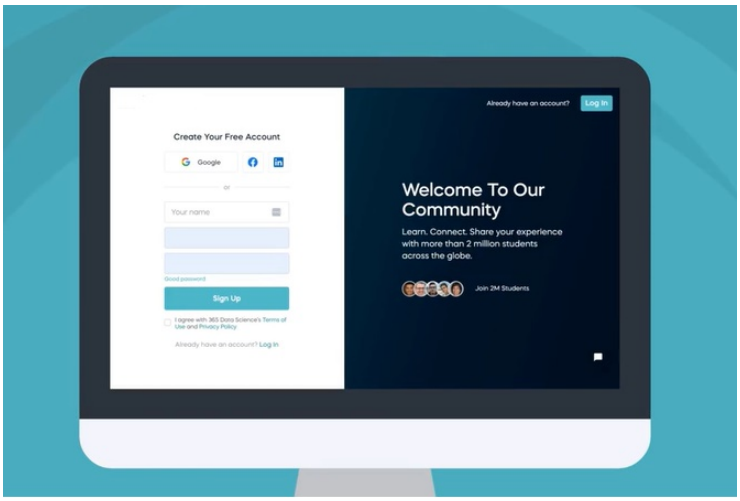


Figure 2

If there is any invalid entry it throws error.
Even login has same options.

4. Case Study

In this case study, we mainly focus on the following topics:

1. Visitors to registered conversion rate
2. Device and OS used
3. Preferred sign up and login methods
4. Error messages (Errors preventing users from logging in and signing up) and many other details

Now to understand the whole process one should know the people involved in platform.
We have mainly three groups

1. Visitor
2. User
3. Customer

When one first visits website he/she referred as visitor (The person has engaged with content but not signed up yet) after Sign up completion visitor becomes user.

Figure 3

Now User is of two types Free and Paid.
When users subscribe to paid content, they become customers and gain access to premium content.
The universal goal is to convert website visitors into paid customers. A key aspect of achieving this is improving the signup flow because the entire cycle begins with sign-up. Otherwise, we risk losing potential customers, just like the restaurant did in our pizza example.
Major KPI used in the analysis are signup success rate and visitor to registered conversion rate.

$$\text{Signup Success Rate} = \frac{\text{Successful outcomes}}{\text{Total number of attempts}}$$

$$\text{Visitor to Registered Conversion Rate} = \frac{\text{Successful sign-up attempts}}{\text{Total number of visitors}}$$

Now how do you evaluate this metric? well you can compare it with industry benchmarks. However, it is not that easy to compare because a few factors may affect the results. For example, the amount of personal information required

can vary; some websites require debit card details for account creation.
In our case for online course platform average conversion rate is 2%.
What Does Conversion Rate Tell Us?
The conversion rate tells us how effective a page is in convincing visitors to take a specific action. If the rate is lower than industry standards, look for issues in the sign up process or user interface.

5. Why and how to optimize registration process in e-business.

Registration is the last step a potential customer takes before starting to interact with the content of your web page. First, you allow them to browse without signing up to attract them and let them get to know your website. It is virtually the entry to your product. Having a robust signup flow gives you the chance to make a good impression and acquire users.
Now, coming to the optimization part, a good signup process will involve a simple, fast, intuitive, and straightforward process that allows visitors to convert into registered users with minimal time and effort.
Flows like these give people the chance to engage with the product right away without spending too much time providing personal information.
Now how do you optimize the signup flow? One option is to ensure visitors complete as few steps as possible to register. For instance, instead of asking for a phone number, only ask for an email and password. Provide options like social media or Google for registration, in addition to phone number. Automate as many steps as possible, such as auto filling the pin code based on location.

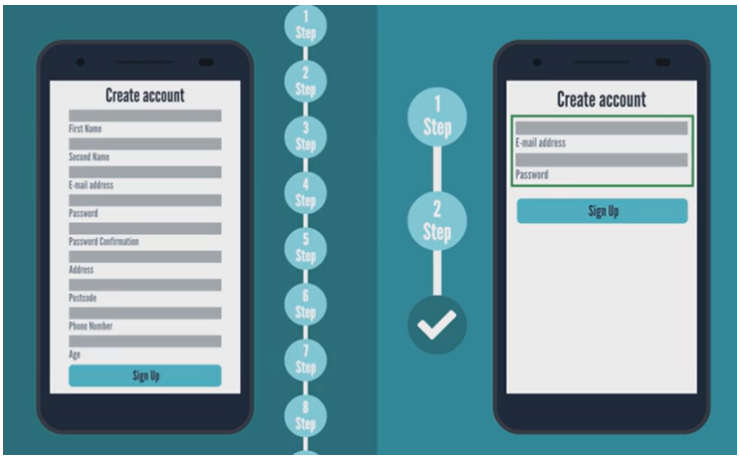


Figure 4

6. Getting to know the Data Base

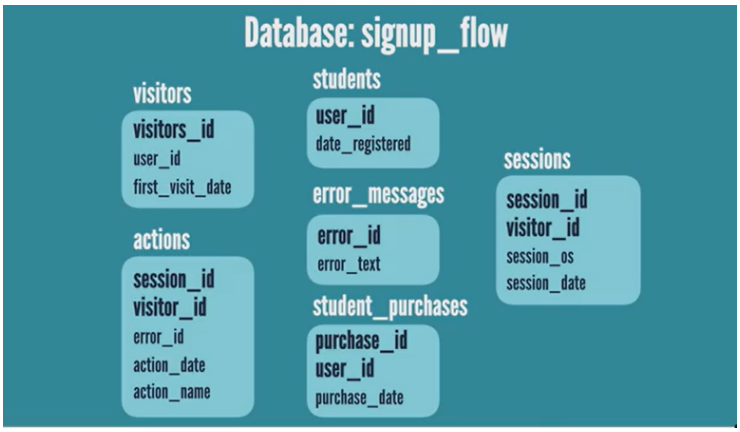


Figure 5

Visitors

visitors_id :

id given to visitor

user_id :

id given to visitor when they signup (it can be null if visitor has never signed up)

first_visit_date :

date when user/visitor visited our website for the first time

Students

date_registered :

Date when user has signed up to our website

Actions

error_id :

id of error message appeared while performing specific action

action_date :

date when action performed

action_name :

name of action performed (sign in, sign up)

Error Messages

error_id :

id of error message appeared while performing specific action

error_text :

error appeared

Student Purchases

purchase_date :

date when user purchased paid course or paid service

Sessions

session_id :

id given of session

session_os :

OS used in session

session_date :

date of session recorded

7. Extracting data from SQL database

Data required to analyze conversion rate

```
use signup_flow;
with total_visitors as (select v.visitor_id,
                               v.first_visit_date,
                               s.date_registered as registration_date,
                               max(p.purchase_date) as purchase_date
                        from visitors v left join students s on v.user_id=s.user_id
                        left join  student_purchases p on v.user_id=p.user_id group by visitor_id),
count_visitors as
( select first_visit_date as date_session ,
         count(*) as visitors_count
         from total_visitors
         group by date_session),

count_registered as
( select first_visit_date as date_session ,
         count(*) as count_registered
         from total_visitors where  registration_date is not null
         group by date_session),

 count_registered_free as( select first_visit_date as date_session,
                                 count(*) as registered_free
                                 from total_visitors where registration_date is not null and
                                 (purchase_date is null or timestampdiff(minute, registration_date,purchase_date)>30)
                                 group by date_session)

select v.date_session,v.visitors_count, ifnull(r.count_registered,0) as count_registered, ifnull(f.registered_free,0) as free_registered
        from count_visitors v left join count_registered r on v.date_session = r.date_session
        left join count_registered_free f on r.date_session=f.date_session
```

Figure 6

Data required to analyze signup type and error

```sql
select a.visitor_id,
    s.user_id,
    ANY_VALUE(CAST(s.date_registered AS DATE)) AS registration_date,
    ANY_VALUE(CAST(a.action_date AS DATE)) AS signup_date,
    any_value(case
        when a.action_name like "%google%" then 'google'
        when a.action_name like '%facebook%' then 'facebook'
        when a.action_name like '%linkedin%' then 'linkedin'
        else 'mail'
        end) as signup_method,

    ANY_VALUE(case when
                a.action_name like "%success%"
                and s.date_registered is not null
                and cast(a.action_date as date)=cast(s.date_registered as date)
                then 'direct success'

            when a.action_name like  "%fail%"
                and s.date_registered is null
            then  'fail'
             WHEN
                    a.action_name LIKE '%fail%'
                        AND s.date_registered IS NOT NULL
                        AND CAST(s.date_registered AS DATE) >= CAST(a.action_date AS DATE)
              THEN
                    'successful retry'
            END) AS signup_attempt,
```

```sql
    ANY_VALUE(IFNULL(e.error_text, '')) AS error_message,
    ANY_VALUE(se.session_os) AS session_os,
    ANY_VALUE(CASE
                WHEN
                    se.session_os LIKE '%Android%'
                        OR se.session_os LIKE '%iOS%'
                THEN
                    'mobile'
                WHEN
                    se.session_os LIKE '%Windows%'
                        OR se.session_os LIKE '%Linux%'
                        OR se.session_os LIKE 'OS%'
                        OR se.session_os LIKE '%Ubuntu%'
                        OR se.session_os LIKE '%Chrome%'
                THEN
                    'desktop'
                ELSE 'other'
            END) AS device
FROM
    actions a
        LEFT JOIN
    visitors v ON a.visitor_id = v.visitor_id
        LEFT JOIN
    students s ON v.user_id = s.user_id
        LEFT JOIN
    error_messages e ON a.error_id = e.error_id
        LEFT JOIN
```

```
        LEFT JOIN
    sessions se ON a.visitor_id = se.visitor_id

WHERE
    a.action_name LIKE '%sign%'
        AND a.action_name LIKE '%click%'
        AND (a.action_name LIKE '%success%'
        OR a.action_name LIKE '%fail%')
        AND v.first_visit_date >= '2022-07-01'
        AND a.action_date BETWEEN '2022-07-01' AND '2023-02-01'
GROUP BY a.visitor_id
HAVING signup_attempt IS NOT NULL
ORDER BY signup_date;
```

Data required for analysing login type and error :

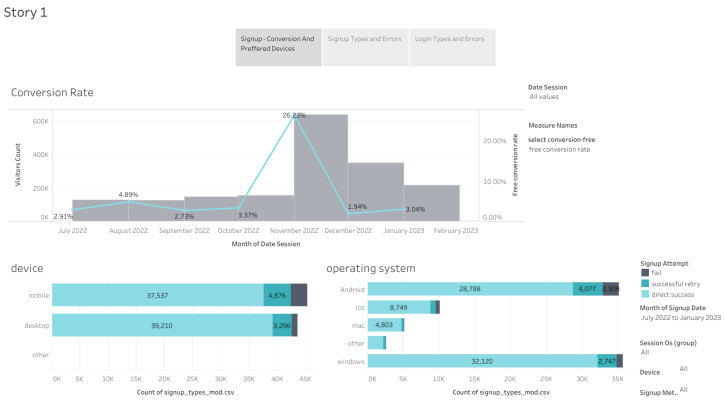
```
USE signup_flow;

SELECT
    ANY_VALUE(ac.visitor_id),
    ANY_VALUE(v.first_visit_date),
    ANY_VALUE(s.user_id),
    ANY_VALUE(CAST(s.date_registered AS DATE)) AS registration_date,
    ANY_VALUE(CAST(ac.action_date AS DATE)) AS login_date,
    ANY_VALUE(CASE
        WHEN ac.action_name LIKE '%facebook%' THEN 'facebook'
        WHEN ac.action_name LIKE '%google%' THEN 'google'
        WHEN ac.action_name LIKE '%linkedin%' THEN 'linkedin'
        ELSE 'email'
    END) AS login_type,
    ANY_VALUE(CASE
        WHEN ac.action_name LIKE '%success%' THEN 'success'
        WHEN ac.action_name LIKE '%fail%' THEN 'fail'
    END) AS login_attempt,
   ANY_VALUE(IFNULL(e.error_text, ' ')) AS error_message,
    ANY_VALUE(se.session_os),
    ANY_VALUE(CASE
        WHEN
            se.session_os LIKE '%Android%'
                OR se.session_os LIKE 'iOS%'
        THEN
            'mobile'
        WHEN
            se.session_os LIKE '%windows%'
```

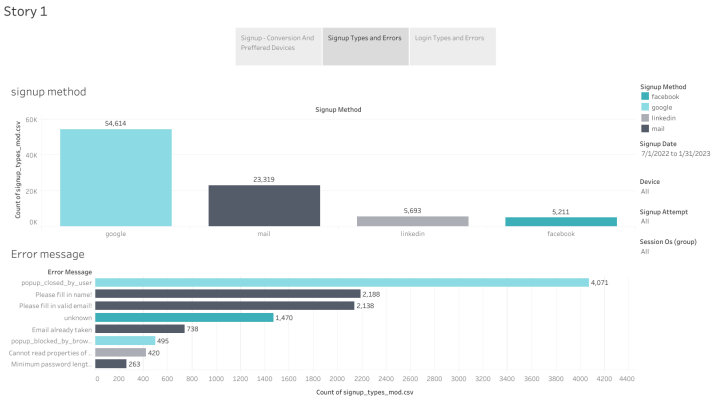
```
                OR se.session_os LIKE 'OS%'
                OR se.session_os LIKE '%Linux%'
                OR se.session_os LIKE '%Ubuntu%'
                OR se.session_os LIKE '%Chrome%'
        THEN
            'desktop'
        ELSE 'other'
    END) AS device
FROM
    actions AS ac
        LEFT JOIN
    visitors AS v ON v.visitor_id = ac.visitor_id
        LEFT JOIN
    students AS s ON s.user_id = v.user_id
        LEFT JOIN
    error_messages e ON e.error_id = ac.error_id
        LEFT JOIN
    sessions se ON se.visitor_id = ac.visitor_id
WHERE
    v.first_visit_date >= '2022-07-01'
        AND ac.action_name LIKE '%log%'
        AND ac.action_name LIKE '%click%'
        AND (ac.action_name LIKE '%success%'
        OR ac.action_name LIKE '%fail%')
GROUP BY se.session_id
HAVING login_attempt IS NOT NULL
    AND registration_date <= login_date
ORDER BY login_date;
```

Rest of the transformation and calculation of KPIs are done in Tableau.

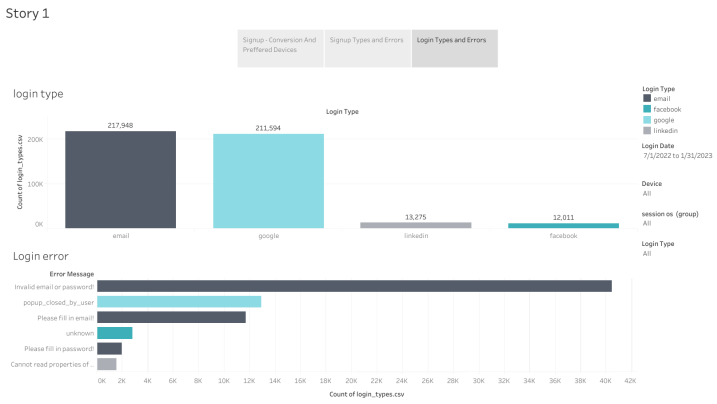
8. Analyzing Conversion rate, Preferred devices and OS:



9. Analyzing Sign up type and Errors:



10. Analyzing Login Types and Errors:



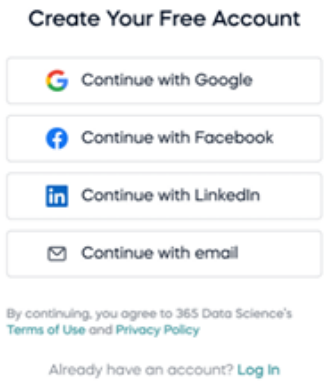
11. Analysis Report

1. Sign-up failed attempts are significantly higher on mobile devices (3.24%) compared to desktop devices (1.16%).
2. Sign-up failed attempts by OS show that the most failed attempts occurred on Android (2,309), while Android also had the most successful retries (4,077).
3. Google is the most favored sign-up choice with the lowest fail rate (3.2%).
4. The email sign-up demonstrates a significant fail rate (6.2%).
5. Facebook is a less popular sign-up choice with a significant fail rate (7.6%).
6. LinkedIn has a comparable number of sign-up attempts as Facebook but a lower fail rate.
7. Frequent email sign-up issues on mobile devices include a total of 1,508 fails, with 1,273 of these occurring on mobile devices.
8. Visitors struggle to input the required data on their mobile screens. 85% of the email errors are related to entering email information.
9. 778 users close the Google pop-up window prematurely (external factor).
10. 349 Facebook errors are unknown.
11. Sign-up success rates: Google at 91%, LinkedIn at 87%, Facebook at 69%, and email at 65%. Additionally, the email login fail rate is 25%.

12. Login errors include 40,454 instances of invalid email or password, making it the most received error. Out of 13,135 Google errors, 11,598 occurred on Windows or Android. Additionally, 11,460 of the error messages from Windows or Android indicate that the popup was closed by the user, suggesting a potential external issue.

12. Actionable Insights

Below is the suggested design image emphasizing social media sign-up options.



1. Simplify the email sign-up option.
2. Minimize the password requirements for email registration.
3. Simplify the password restoration process.
4. Investigate the 'unknown' error for Facebook sign-up.