WhatsApp: can it grow without a user increase?

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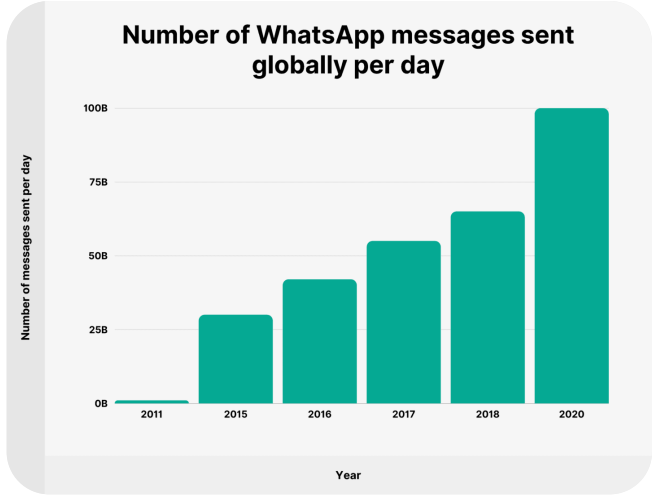
Business Question

If we increase the amount of push notifications on the WhatsApp mobile app, would this increase the number of messages sent and received on the platform?

PROBLEM

WhatsApp is a messaging app that is owned by Facebook. It allows users to send voice and text messages, make voice and video calls and share images / videos, etc. It is generally used on mobile devices but does have a desktop component as long as the user's mobile device remains connected to the Internet while they use the desktop app. It is popularly used to make international messages and is used in a variety of countries, including the US, India, Brazil, Indonesia, etc.

In the past 2 years, the App recorded **first a huge spike** in the amount of new users and messages sent on the platform (due to the pandemic and the need for more virtual communication). However, in the recent months and in the last two quarters, it appears that WhatsApp **reached a peak** in terms on new users, which are currently stagnating around 2 Billion.

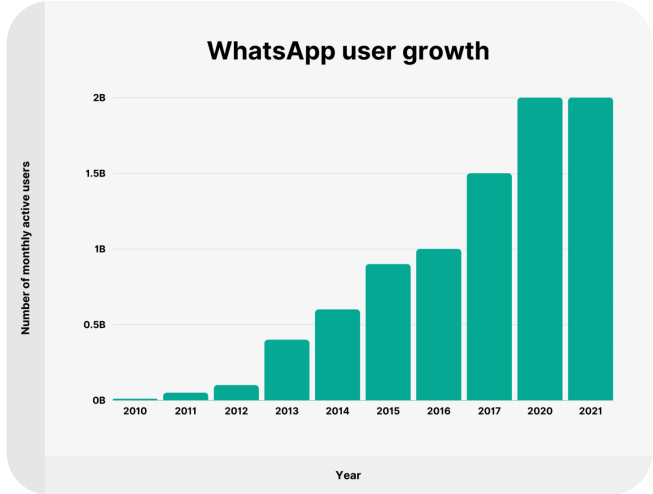


SOLUTION

The goal will be to increase the number of messages sent and received on WhatsApp in order to try to have an increase in the data sent through the app without having an increase in the number of new users

There are two types of user groups we can focus on: prospects and existing users. **Prospects Users** are the users that have never used Whats App. We would need to focus on bringing them into the platform to increase the overall user population / messages being sent and received. **Existing Users** are the current users of WhatsApp.

In order to try to solve our problem and increase the number of messages sent in the app we would need to **focus only on the existing users** since they provide an existing amount of data we could analyze



Source: Statista, WhatsApp website

Analytics Approach

To better understand if push notifications would increase the number of messages sent and received on WhatsApp we could run an A/B test and analyze the resulting experimentation data

A/B TEST

A/B Tests could allow us to have the status quo and the control group in one hand (the users with the current WhatsApp mobile App version), while on the other hand we could have one or even **multiple treatment groups**.

These different treatment groups could test **different types of notifications** (push, personalised or random notifications) or even test different amounts and/or notifications strategies (low/high amount of notifications, notifications only in one part of the day)

For this particular business question, A/B tests could probably be the **best option** for the flexibility they provide. While it is true there could me countless of other external factors, WhatApp's huge amount of users and data could be the **ideal environment** to replicate experiments with randomized but statistically controlled treatment groups.

QUASI-EXPERIMENT

Quasi-Experiments are used when the environment or the data don't allow a structured and experimental approach (typical instead of A/B tests) and when there are **multiple factors** affecting a certain business question.

In the particular problem we presented we could think of **many different external** factors influencing the amount of messages sent and received on WhatsApp beside the changes in notifications (e.g. an area that is affected by a natural distaster, an interruption in electricity, a big social event). However, the size of WhatApp users allows to form big and numerous groups around the world that could be considered completely controlled. If we had the same problem for a **smaller company** maybe we could have not thought of A/B tests and we'd have had to think of performing a **quasi-experiment**.

WHAT-IF ANALYSIS

What-If analysis could be **suitable** for this business question because WhatsApp is a huge platform and we could try to segment the billions of users based on the different amount of messages sent in different geographies or demographics groups.

This approach could probably deliver **some results** in identifying when users send more messages, but it would nonetheless be the **most expensive and difficult** to realize because of the complexity of the population.

If the time and the resources would be adequate, we could think of **combining A/B tests with What-If analysis**. A/B tests could provide us with a significant amount of hard data while What-If analysis could be a useful tool to understand, polish and segment better the intuitions we would obtain with the first method.

A/B Test

We could design an experiment where the App version of the treatment group sends push notification reminders to make the inactive users engage more in WhatsApp

HYPOTHESIS 

- The users who receive push **notification reminders** to use WhatsApp will send **more messages** to their friends.
- This **notification** system will **increase the average number of messages** sent in the whole user base in a certain period of time.

EXPERIMENT 

- **Control Group A:** The users of this n Does do receive any push notifications. The users need to be a similar group as the Treatment Group B in terms of region, age, social environment.
- **Treatment Group B**: The users of this group receive push notifications to get them to engage in the app. One example could be a notification with the message: "Don't forget to check in with your friends using WhatsApp" after a certain period of inactivity.

SUCCESS METRICS 

- **Average number of messages** that a certain user in the **group** B sent versus number of messages that a demographically similar user in group A sent
- **Total messages** sent by Group B versus total messages sent in Group (**positive correlation**)
- **Time gap** between the next message sent and the push notification (for example, did users in B send a message right after they received the push notification?)

TRADE-OFFS 

- Users may **turn off the push notifications** from WhatsApp. This could also make the A/B test analysis difficult.
- Users may not enjoy additional notifications that could be far from what WhatsApp has done until now. This could make users not like this kind of change and even make them **switch over competitors** messaging Apps.