

# Rational Growth

An introduction to growing user signups via data and analytical thinking

By Sandi MacPherson

Via interviews with Andrew Chen

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## Rational Growth

We live in world where it's easy to write code, but still hard to get the code into the hands of customers and users.

Luckily, the same skills that make technology products possible – the analytical thinking that drives the engineering skills for product development – can be applied to “engineering” the growth of your users as well. The foundation of this thinking is to build a spreadsheet that models out how people discover and sign up to your product. By refining this model with real life data, you can to simulate different scenarios and to prioritize product changes. Finally, by deploying this code to real life and observing its effects, you can then further refine your model to make better changes in the future.

This eBook will focus on thinking about your signup flow, which is often the highest point of leverage in your product. Products often lose 80-90% of their users within the first couple screens and the first couple minutes of their experience. Improving this is key to having a successful product. But the ideas explained here can be applied anywhere- whether you're trying to encourage more inviting, sharing, or more.

This is an introduction to the topic – there is much more literature out there, but I hope this is a good starting point to learn to think analytically about growth.

**Written by Sandi MacPherson (@sandimac)**

**Based on interviews with Andrew Chen (@andrewchen)**

## From Visual to Spreadsheet

“All models are flawed, but some are useful” – George Box (Statistician), 1979

Before you can start this eBook, you need a product. And you need some users who are signing up to your product, even a small trickle will do. If you haven't done this yet, no optimization process will help you! So start there first. Even better is a product that has deeply engaging usage and a vibrant community around it, even if the userbase is small. An optimization process will turn good products with small audiences into good products with big audiences. But rarely will it turn a bad product into a good one.

Once you have some data on signups and growth, the first step in thinking analytically about your signup process is to create your first model. The goal is to reduce the complexity of your product down to a simpler, abstract spreadsheet-based representation. This lets us examine each variable in more depth, and see how they interact with each other. This offers clues for what you can optimize.

Usually this kind of model works by breaking down a signup process into a row-by-row representation of what percentage of users finish each step. This lets you identify bottlenecks, and then brainstorm ideas for how to fill in these gaps.

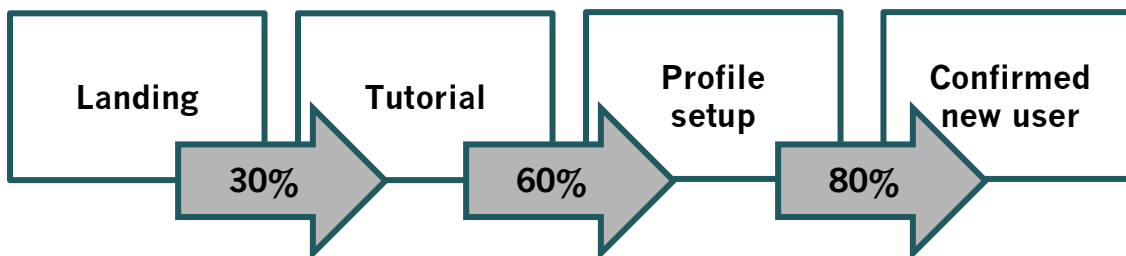
Roughly, here's your plan of attack:

1. Map out the major steps within your signup process.
2. Enter baseline data into a growth model.
3. Come up with hypotheses for how to increase the %s.
4. Examine their impact by altering the growth model to see the potential effects.
5. Prioritize the potential hypotheses based your calculations.
6. Execute the best idea.
7. Repeat from step 2.

## Your Signup Flow

One of the foundational elements in crafting an accurate growth model is to think about your product as a step-by-step funnel from the standpoint of the user, rather than a content hierarchy. Rather than the homepage to start, think about what a new user experiences first – often some kind of profile page or detail page.

What does your signup flow look like? What are the different actions that are required for a new user to signup to your website? What are your completion rates at each step? \* Here's an example signup flow:



Based on this flow, and the %s you could reduce this to a spreadsheet model with something like below, with a few distinct steps:

Page	Action	CTR
Landing	Signups	30%
Profile setup	Ask for name, bio, etc.	60%
Tutorial	View tutorial on homepage	80%
<b>Total users signed up</b>		<b>14.4%</b>

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\*Each page in any signup design has at least one action for the user to complete (e.g. enter details, confirm account, etc.). The click-through rate (CTR) is the percentage of users that complete that action and continue to the next page.

## Build Your Spreadsheet Model

Creating a spreadsheet model is a great tool to simulate potential changes to your signup flow, allowing you to get an understanding of how those changes will affect the number of users you're able to sign up and for what cost.

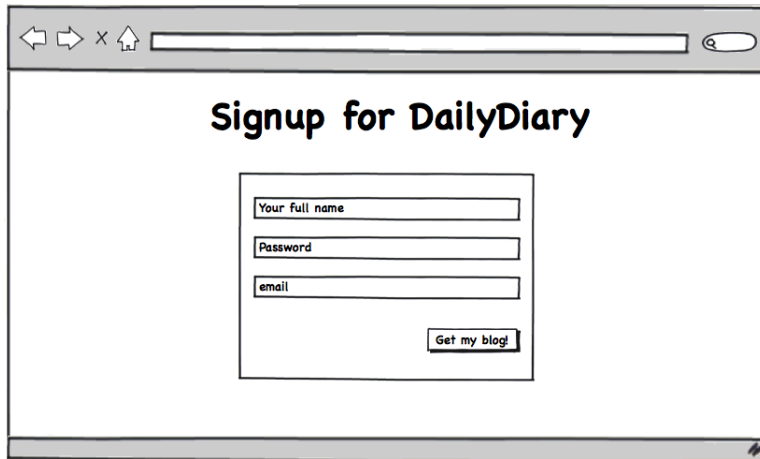
Modeling your signup flows like this isn't intended to give you the "answer" to what you should do. Instead, it's a forecasting tool, and a different way of thinking, that gives you some quantitative output in addition to the qualitative decision-making that you're already used to.

Here are two example signup designs to demonstrate this thinking – both products are made up, but include some rough mockups so that you can understand the details:

1. **DailyDairy** will show a website that has a long signup process, versus a website with a similar signup design with fewer pages and will estimate changes in both Customer Acquisition Cost (CAC) and converted users.
2. **TeamShare** will compare a signup design that requires payment versus one that offers a free trial.

## Baseline example

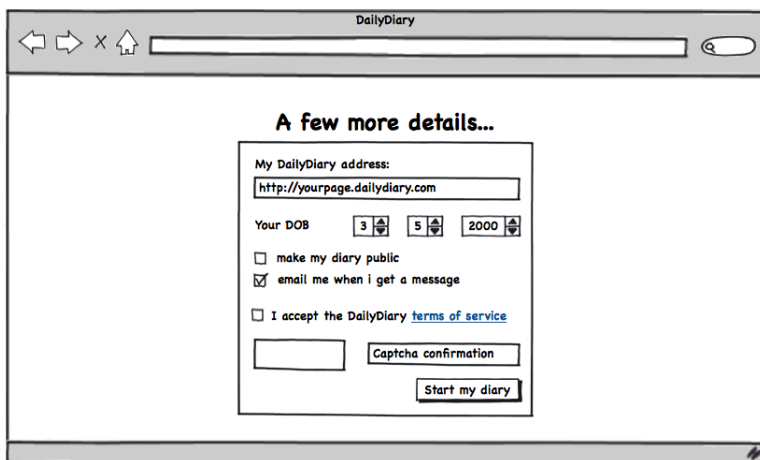
Let's say you have a new diary website, called DailyDiary:



A browser window showing the 'Signup for DailyDiary' page. The page has a title bar with back, forward, and search icons. The main content area has the heading 'Signup for DailyDiary' and a form with three input fields: 'Your full name', 'Password', and 'email'. A 'Get my blog!' button is located below the 'email' field.

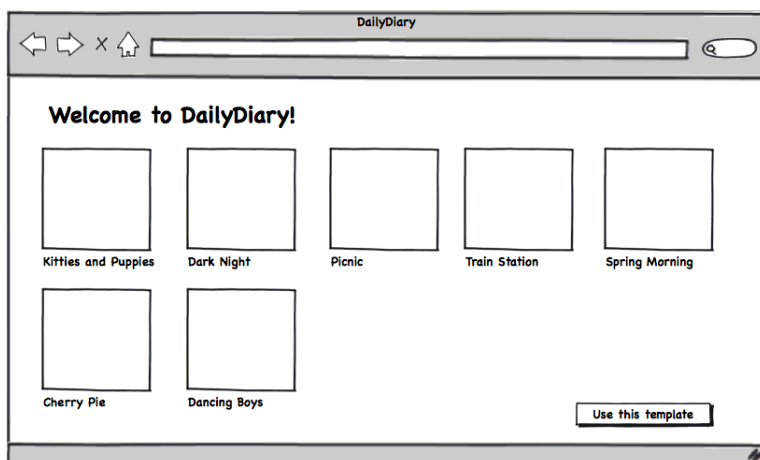
1. On the landing page, the user is prompted for their full name, a password, and email.

Often, landing pages are profile pages or detail pages, not the homepage.



A browser window showing the 'A few more details...' page. The page has a title bar with back, forward, and search icons. The main content area has the heading 'A few more details...' and a form with several fields: 'My DailyDiary address:' with a text input field containing 'http://yourpage.dailydiary.com'; 'Your DOB' with three dropdown menus showing '3', '5', and '2000'; a checkbox for 'make my diary public'; a checked checkbox for 'email me when I get a message'; a checkbox for 'I accept the DailyDiary [terms of service](#)'; a 'Captcha confirmation' input field; and a 'Start my diary' button.

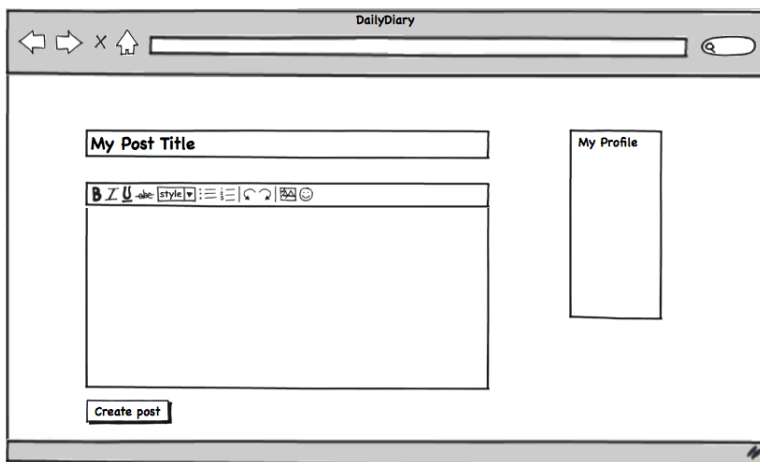
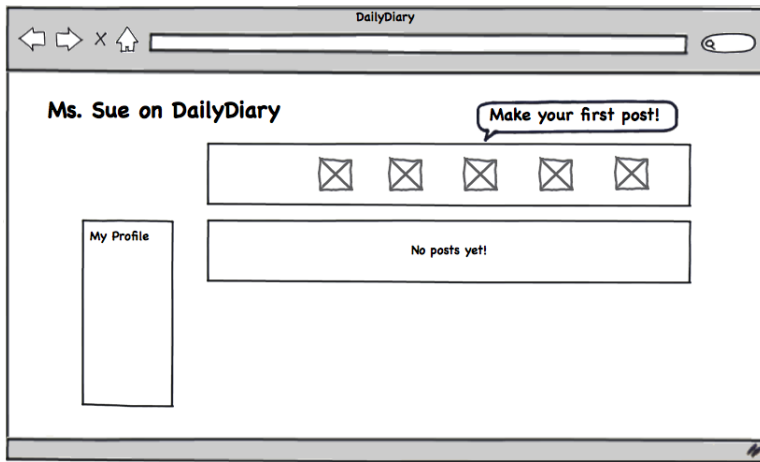
2. Next the user is brought to a page asking for more details, their notification schedule, terms to accept, and a CAPTCHA.



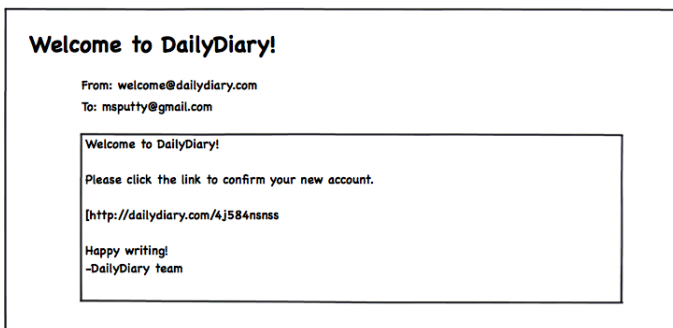
A browser window showing the 'Welcome to DailyDiary!' page. The page has a title bar with back, forward, and search icons. The main content area has the heading 'Welcome to DailyDiary!' and a grid of seven template thumbnails. The thumbnails are labeled: 'Kitties and Puppies', 'Dark Night', 'Picnic', 'Train Station', 'Spring Morning', 'Cherry Pie', and 'Dancing Boys'. A 'Use this template' button is located at the bottom right of the grid.

3. The user is then asked to select what style of template they'd like to use.

4. Next the user is brought to their homepage and a tooltip suggests that they write a new blog post.



5. The 'new blog post' page is simple with few actions, and makes it very easy for the new user to create their first post.



6. A follow-up confirmation email is sent to the user after setting up their account.

After creating this visual flow, the next step is to quantify the drop-off at each step. To measure this, you can use a funnel-tracking feature from a product like Mixpanel or Google Analytics, or you can track this manually in your database. For the sake of this conversation, let's say you come up with the following:

Page	Action	CTR
Landing	Signup	25%
Details	More data and captcha	50%
Template	Choose template	75%
Dashboard	Follow tooltip	60%
Post	Create post	50%
<b>% of new users who post</b>		<b>5.6%</b>

When multiplied together, each step's completion rates gives a total conversion rate of 5.6% who ultimately write a post, which you get from multiplying together the variables.

Looking at the model above, you can tell exactly where people are dropping off. This is the first step in trying to understand how to go from 5.6% to something better. Question is, how would you make this better?



# How to Brainstorm About Growth

Creativity combined with rapid iteration are the keys to making progress on user growth. Remember that you can get to 10X growth by a combination of 2Xing a few different metrics, hitting one out of the park, or getting 10% increases across the board. They all multiply together to be 10X. If you can brainstorm a lot of ideas, going for quantity over quality, you'll have a lot of ideas to evaluate for impact versus cost.

A few tips on getting the most out of your ideas:

- Think about each step of your flow and come up with as many ways as possible to make that step better, with a higher % conversion.
- Try to shorten the flow. What could you take out and ask the user to do later? What's really required? Try to make it possible to sign in with just the mouse, and don't require anything on the keyboard.
- Try to rearrange the flow so that the highest value proposition for the user comes first—nobody likes to start by giving their email address
- Explore classic landing page techniques—try very long pages or very short pages.
- Simplify each page, removing navigation and distractions so that there's just a single call to action for what the user can do. Don't encourage the user to explore the site—get them to sign up first and foremost.

There are tons and tons of ideas out there, and many I get out of inspiration from looking at other products. Try out a lot of other well-designed products and see what you can experiment with too.

## Baseline example

For the sake of this discussion, let's take the classic method of trying to shorten the signup process and making it so that the user can do as little as possible to get started. To see how the model plays out, let's say you remove 2 pages from the flow to get the user to create a blog post.

It might look something like this:

The image shows two browser window mockups. The top window is titled 'Blogtime' and displays a 'Signup for DailyDiary!' form. The form includes fields for 'Your full name', 'http://mysite.dailydiary.com', 'Password', 'email', and a 'Captcha input' field. There is a checkbox for 'I accept the DailyDiary terms of service' and a 'Get my blog!' button. The bottom window is also titled 'Blogtime' and displays a 'My blog' dashboard. It features a 'Make your first post!' tooltip, a row of five placeholder icons (represented by squares with an 'X'), and a 'No posts yet!' message. A 'My Profile' sidebar is visible on the left.

1. This landing page asks the user for their details, and includes a CAPTCHA and terms of service. The page is a bit cluttered, so the CTR of this page might drop versus the previous simpler landing page.

2. The new user is brought immediately to their new dashboard. A tooltip shows them how to create their first blog post.

3. The ‘new blog post’ page is the same as the previous version, and aims to get the new user to create their first post. Also similar to the previous example (but not shown here), a confirmation email is sent to the new user to confirm their account.

In a typical situation, you should make mockups of a simplified signup flow like this as well as complete your spreadsheet model to try to figure out what would happen. When you do this, it’s hard to figure out what are realistic expectations for how your numbers would change, but with experience, you’ll get better and better at simulating changes.

In this proposed set of changes, you’ve combined the first two pages of the original signup design into one page, and have removed the ‘Choose Template’ page. You could guess as to what this might result in by removing and combining a few variables in your signup flow, which might look something like this:

Page	Action	CTR
Landing	Enter details and CAPTCHA	20%
Dashboard	Follow tooltip	80%
Post	Create post	50%
<b>% of new users who post</b>		<b>8.00%</b>

This spreadsheet is now the basis of your forecast of what might happen when these changes are made. The idea here would be to get from your original conversion rate of about 5.6% to something more like 8%, which is a relative increase of about +40%. Is this worth it? Are there other product changes that might make a bigger impact? This is the kind of thought process you can go through to figure out how to prioritize your growth projects.

Of course, reality is what counts. The next step would be to start implementing these changes on our website, and track CTRs to see how our estimated data compares. As you get more data from your own iterations and within the context of your product and audience, you'll get more comfortable guesstimating in your models.

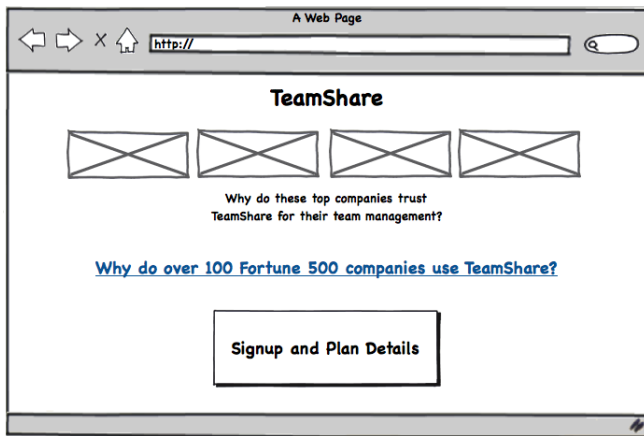
You might wonder, what's the point of this if you can't get exact numbers right away? That's the point of modeling this out. No one will have your particular audience, product, and signup flow, so each set of numbers is entirely situational. The most important thing is that this can **help you think systematically about your decisions**. You can create conservative versus aggressive models and fill it in with any variables you do know, and use that to figure out if it's worth it.

You'll never get a black and white answer for this, but it's better than randomly adding product features based on the emotions and needs of the team. While that's great for refining core product, when it comes to systematically growing a user base, a more scientific approach is warranted.

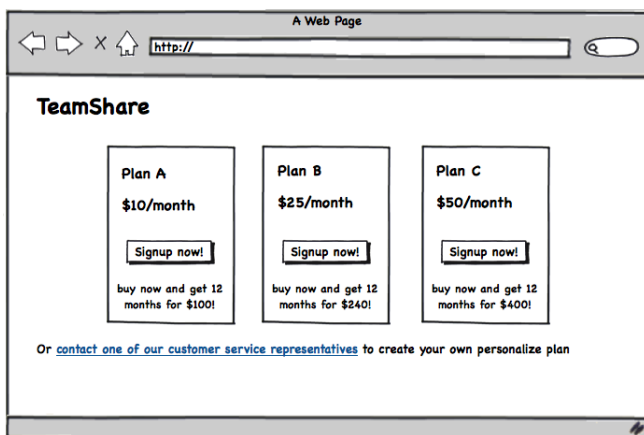
## Convert Now versus Free Trial

Here's another scenario: How would CAC and conversion rate compare between one website that requires new users to signup (and pay) immediately, versus one that offers a free trial? You're probably thinking that the free trial conversion rate would be higher, but do you know by how much?

You can use the same approach as before to estimate the before and after CAC and conversion rates. Let's start with your example, TeamShare, for team collaboration:



1. The customer arrives at the landing page and is prompted to signup and purchase a plan.



2. A plans and pricing page is displayed, and the new user selects a plan to continue. Bundles are offered to encourage larger up-front purchases.

**TeamShare**  
Create your new team management solution in minutes!

Full Name   
email   
password   
Company

Do you have a promo or discount code?

Credit card number   
Type  Expiry

Create free TeamShare account

3. The customer is then prompted for their contact and payment information. An optional promotional code allows for sales reps to encourage customers to signup to receive deals.

**TeamShare**

Team A

Project A  
Project B  
Project C

4. The dashboard is presented and the customer can begin to use the full version of the website.

Before changing the signup design to one that offers a free trial, you'll use a signup model to simulate the changes and estimate the resulting changes. Having a model of your signup metrics (based on actual or estimated data) before making the changes versus making changes without first consulting one helps you forecast the potential impact and prioritization of this change.

Page	Action	CTR
Landing	Get more info	50%
Plan/pricing	Choose plan	20%
Signup	User/payment details	3%
<b>Total paying users signed up</b>		<b>0.30%</b>

You've estimated a current total conversion rate of paying users at 0.3% of those that visit the landing page, which equates to a CAC of \$200.00 (based on a CPC of \$6.00).

Let's adjust your model to simulate a signup design with a free trial. You're going to estimate increases in CTR on both the Plan/Pricing and the Signup pages versus the original required payment signup design CTRs.

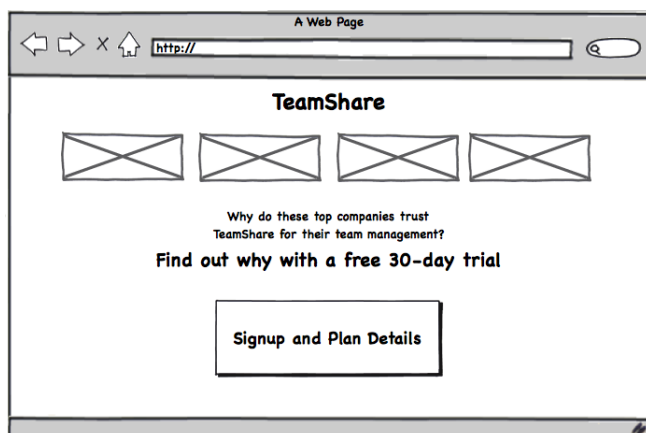
Page	Action	CTR
Landing	Get more info	50%
Plan/Pricing	Choose plan	30%
Signup and usage	Lots of user activity	60%
Freemium	Payment details	15%
<b>Total free trial users signed up</b>		<b>1.35%</b>

Assuming that a large % of users become engaged, you might ultimately find that a large % of users who sign up ultimately end up converting to a premium offering.

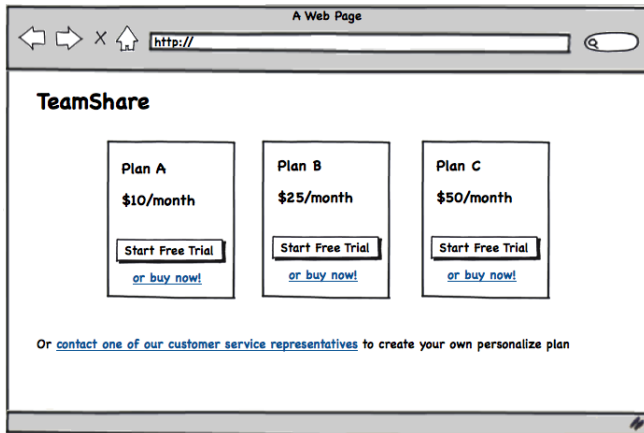
Your model of the free trial signup design gives you a much better conversion rate of 1.35%, resulting in a CAC of \$44 – drastically lower than the original \$200.00. However, keep in mind that this kind of model only suits specific kinds of products that have high-retention and where users have a path to a freemium wall.

However, this data is integral to your decision making process when considering whether or not to offer a free trial, and the costs associated with doing so.

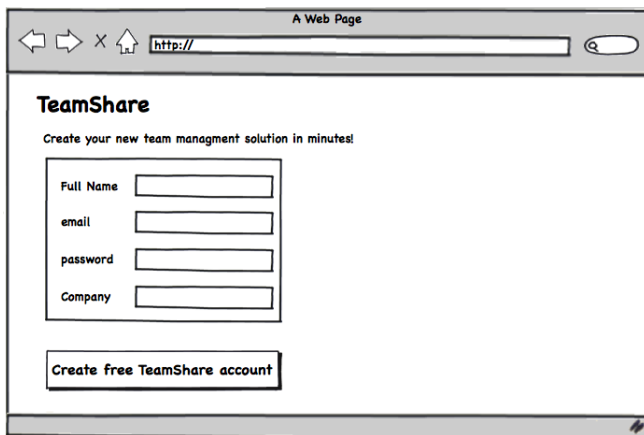
For completeness, let's see what this new signup design might look like:



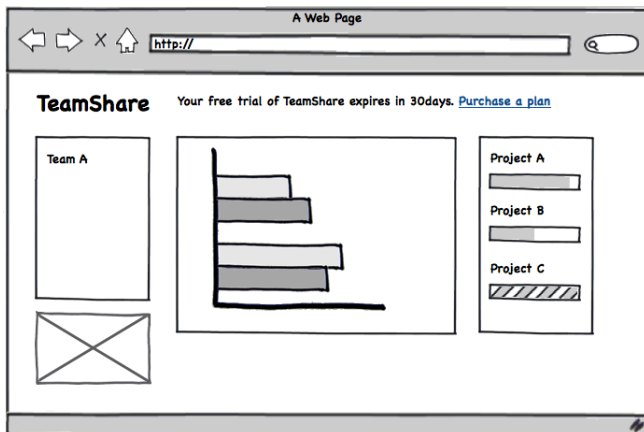
1. The customer arrives at the landing page and is prompted to sign up for a free trial or to review the details of the paid plans.



2. A plans and pricing page is displayed and a free trial of a plan is selected. The new user is expected to begin a free trial, so that option is the most prevalent.

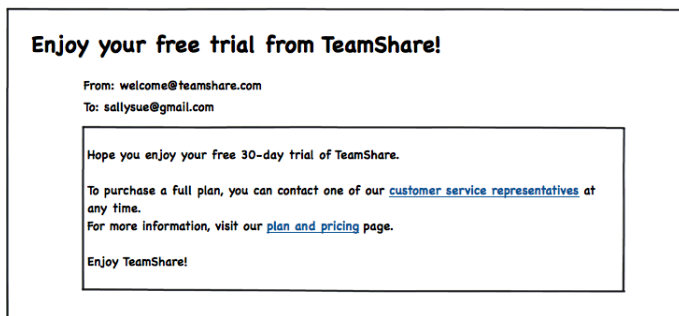


3. The new user is then prompted for their personal and work details.



4. The new user is brought to their dashboard. A notice on the top of the page with a countdown clock shows how much time remains in their trial.





5. A confirmation email is sent to remind the user about the length of their trial and how to contact a representative if they're interested in a paid plan. Trigger emails will also be sent closer to the end of the trial date to encourage them to purchase a plan – an important step in converting trial users into paying customers.

It's important to note that after you create this model, and these mockups, the next thing you have to do is to evaluate the ROI of the experiment versus the other ideas you have. Then if it makes sense, implement the experiment (most likely in some kind of A/B test), check the resulting numbers against your forecast, then keep going.

To reiterate, this is all basic stuff, but is really a different way of thinking about and assessing the impact of your features. It's a more rational and more scientific way to measure the impact of signup and conversion rates, so that you can spend your time working on projects that have high impact with low cost. Combine this with a high iteration speed where your team can push out many of these experiments every week, and you're well on your way to 10Xing your growth rate.

Oftentimes, you'll find that only 2-3 A/B tests out of every 10 will perform better than your baseline case. Given that, you'd have to run at least a half dozen per week to see a positive result on a regular basis. If you only run 1 or 2 A/B tests, it's easy to get discouraged early.

## Other random notes on things to try

Here are some other popular techniques that you can try to improve your completion rates and lower your customer acquisition costs:

1. While a shorter signup flow can be a big help in raising conversion numbers, it's not a cure-all solution. Some pages can become too cramped and are new users may find the discouraging. As you saw in the blogging example, 2 pages at 30% each will yield a 9% conversion rate at the end – so if you can combine those 2 pages into one with a conversion rate greater than 9% – do it!
2. Any 'high value' pages should be upfront as more people are present at the beginning of your signup flow than the end (e.g. an 'invite friends' page). If you have multiple goals in your signup flow – prioritize, and move the important ones nearest to the beginning. The same concept applies for high conversion rate pages. If you can get more people through the beginning steps, there'll be a higher chance that more of your signup goals will be completed.
3. Try different registration types (e.g. sign up with Facebook or Twitter). The success of these will depend on your audience, and could yield positive or negative results.
4. 'Lazy registration' is a technique used by some websites (e.g. <http://www.geni.com>, <http://www.doodle.com>) where the user experiences the product during the signup process. Signing up for the site is an expected part of using the website itself. This type of signup is very easy for the new user to complete, but can only work with certain types of websites.
5. With ecommerce sites, the costs associated with acquiring a customer are not necessarily your only concern, and you are more concerned about your overall ROI. This means you must consider up-sell and cross-sell techniques to push the customer to purchase more items.
6. Bundling is a common tactic with SaaS products. You can increase the amount that your customers spend at one time by offering them a discount when they

spend more at one time. If you set the price high enough, you'll potentially be able to cover your CAC with one purchase, versus trying to bring the customer back to your website multiple times to pay for separate chunks.

7. Many SaaS products have begun offering a free trial, which allows you to obtain the user's contact information to follow up with them if they don't initially make the purchase.
8. For any type of website, the payment step is often high churn. This is a good page to experiment with to try to optimize for the highest possible CTR.
9. It is always important to optimize your ads. There's no point in paying for clicks that will never convert into users. Great ads are key – even a perfectly designed signup flow can't convert people who are uninterested.
10. There are many online resources about optimizing landing pages. Read up on best practices (see our Resources section later for suggestions), and A/B test them until you come up with a winner.

Remember that overall, none of these specific techniques are guaranteed to improve your signup flow. However, with a growth spreadsheet, you can now start to model changes to your signup flow and simulate what might happen, helping you to make data-driven decisions.

## Conclusions and next steps

This eBook primarily focused on the key step of signing users up, but of course that's merely one step out of many. The more important lesson is the process of mapping your product's UX into a spreadsheet, simulating and prioritizing product changes, and then running the experiment to validate your hypotheses.

You can take this rational approach to many other pivotal moments in the lifetime of your product as well, including:

1. Activating users
2. Increasing usage and activity
3. Retaining and re-engaging users
4. Getting users to invite their friends
5. Converting users from free to paid
6. ... and much, much more

Each one of these moments is just as important as a signup, and each one can be broken down into a step-by-step funnel and optimized. The same techniques as you can use for optimizing signups can also be used in these other activities – just build your model, put in baseline data, try out a bunch of experiments, then measure again to see if you've improved things.

On a final note, it's important not to go overboard on optimization. New products are about providing deeply engaging experiences, and optimizations can help you bring that to more people and make sure a larger percentage of new users have positive experiences. Optimization won't help you fix something that's broken, or get you out of a market that's too small. Consider this just another tool in your tool belt, to be used once a product is working well and just needs more growth.