5

Investment

In exploring the Hook Model, we discussed in chapter 2 the importance of aligning with the right internal triggers, and how by utilizing external triggers, designers can then prompt users with information for the next intended action.

In chapter 3 we learned about the role of the smallest actions taken in

anticipation of immediate rewards. In chapter 4 we looked at how variable outcomes influence repeat engagement. There is one last step in the Hook Model that is critical for building habit-forming technologies. Before users create the mental associations that activate their automatic behaviors, they must first *invest* in the product.

Changing Attitude

In chapter 1 we learned about the tooth-flossing study in which researchers de termined that the frequency of a new behavior is a leading factor in forming a new habit. The study also found that the

second most important factor in habit formation is a change in the participant's attitude about the behavior. The finding is consistent with the Habit Zone graph explained in the first chapter, which illustrates that for a behavior to become routine it must occur with significant frequency and perceived utility. Attitude change is the movement up the perceived utility axis until the behavior enters the Habit Zone.

But in order for a change in attitude to occur, there must be a change in how users perceive the behavior. In this chapter, we will start by exploring the mystery surrounding how small investments change our perception, turning unfamiliar actions into everyday

habits.

A psychological phenomenon known as *the escalation of commitment* has been shown to make our brains do all sorts of funny things. The power of commitment makes some people play video games until they keel over and die.[1] It is used to influence people to give more to charity.[2] It has even been used to coerce prisoners of war into switching allegiances.[3] The commitments we make have a powerful effect on us and play an important role in the things we do, the products we buy, and the habits we form.

The more users invest time and effort into a product or service,

the more they value it. In fact, there is ample evidence to suggest that our labor leads to love.

We Irrationally Value Our Efforts

In a 2011 study, Dan Ariely, Michael Norton, and Daniel Mochon measured the effect of labor on how people value things.[4]

U. S. college students in America were given instructions to assemble an origami crane or frog. After the exercise students were asked to purchase their creation, bidding up to $1. Assemblers were informed that a random number between zero and one hundred was to be

drawn. If it exceeded their reservation price in cents, the assemblers would return empty-handed—but if it was equal to or less than their bid, they would pay their bid and keep the origami. Meanwhile, a separate group of students located in another room, unaware of the identity of the assemblers, were asked to bid on their origami using the same procedure. Similarly, a third independent group was asked to bid on expert-made origami under the same criteria.

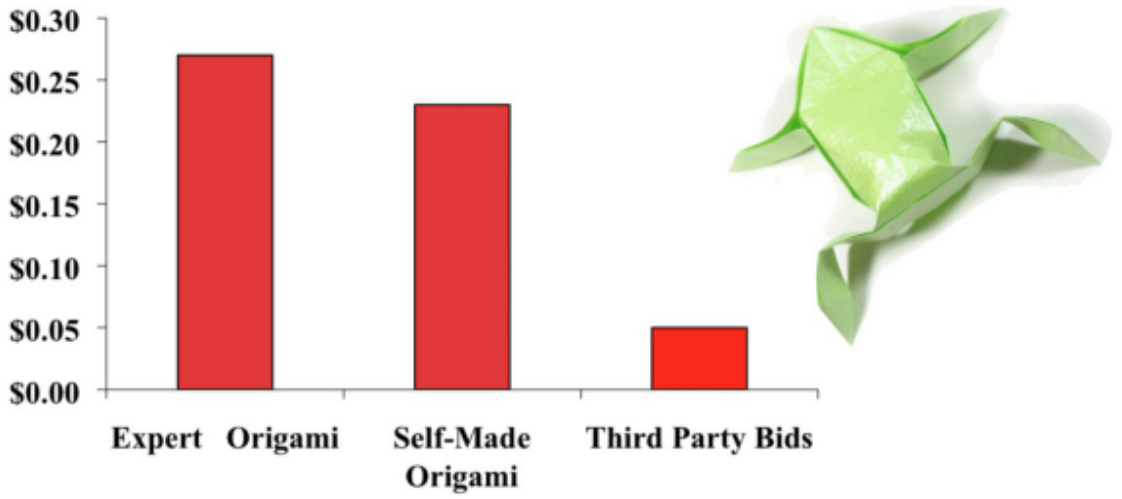

FIGURE 28

The results showed that those who made their own origami animals valued their creation five times higher than the second group's valuation, and nearly as high as the expert-made origami values (figure 28). In other words, those who invested labor associated greater value with their paper creations simply because they had worked on them.

Ariely calls this the IKEA effect.

IKEA, the world's largest furniture retailer, sells affordable, ready-to-assemble household furnishings. The Swedish company's key innovation is its packaging process, which allows the company to decrease labor costs, increase distribution efficiency, and better utilize the real estate in its stores.

Unlike its competitors who sell preassembled merchandise, IKEA puts its customers to work. It turns out there's a hidden benefit to making users invest physical effort in assembling the product —by asking customers to assemble their own furniture, Ariely believes they adopt an irrational love of the furniture they built, just like the test subjects did

in the origami experiments. Businesses that leverage user effort confer higher value to their products simply because their users have put work into them. The users have *invested* in the products through their labor.

We Seek to Be Consistent with Our Past Behaviors

How much do past behaviors alter our future actions? We'd like to think we are free to choose to act in any way we'd like—that our judgment is not clouded by our past actions. But in fact, studies reveal that our past is an excellent predictor of our future.

A team of researchers asked a group

of suburban residents to place large, unsightly signs in front of their homes that read DRIVE CAREFULLY.[5] Two groups were tested. In the first group only 17 percent of the subjects agreed to the request, while 76 percent of those in the second group agreed to post the ugly yard signs. What was the cause of this huge discrepancy? The groups were identical except for one factor.

Those in the second group were approached two weeks prior to the yard sign request and asked to place a much smaller, three-inch sign that read BE A SAFE DRIVER in their windows. Nearly everyone who was asked to place the smaller message agreed to this. When the researchers returned two weeks

later, a whopping majority of these residents willingly replaced the small sign with the large one on their front lawns.

The homeowners' greater willingness to place the large, obtrusive sign on their lawns after agreeing to the smaller one demonstrates the impact of our predilection for consistency with our past behaviors. Little investments, such as placing a tiny sign in a window, can lead to big changes in future behaviors.

We Avoid Cognitive Dissonance

In a classic Aesop's fable, a hungry fox encounters grapes hanging from a vine. The fox desperately wants the grapes.

Yet as hard as he tries, he cannot reach them. Frustrated, the fox decides the grapes must be sour and that therefore he would not want them anyway.

The fox comforts himself by changing his perception of the grapes because it is too uncomfortable to reconcile the thought that the grapes are sweet and ready for the taking, and yet he cannot have them. To reconcile these two conflicting ideas, the fox changes his perception of the grapes and in the process relieves the pain of what psychologists term *cognitive dissonance*.

The irrational manipulation of the way one sees the world is not limited to fictional animals in children's stories.

We humans do this as well.

Consider your reaction the first time you sipped a beer or tried spicy food. Was it tasty? Unlikely. Our bodies are designed to reject alcohol and capsaicin, the compound that creates the sensation of heat in spicy food. Our innate reaction to these acquired tastes is to reject them, yet we learn to like them through repeated exposure. We see others enjoying them, try a little more, and over time condition ourselves. To avoid the cognitive dissonance of not liking something that others seem to take so much pleasure in, we slowly change our perception of the thing we once did not enjoy.

• • •

Together, the three tendencies just described influence our future actions: The more effort we put into something, the more likely we are to value it; we are more likely to be consistent with our past behaviors; and finally, we change our preferences to avoid cognitive dissonance.

These tendencies of ours lead to a mental process known as *rationalization*, in which we change our attitudes and beliefs to adapt psychologically. Rationalization helps us give reasons for our behaviors, even when those reasons might have been designed by others.

At a 2010 industry conference, Jesse Schell, a renowned game designer and professor at Carnegie Mellon University, articulated the peculiar train of thought some players exhibit online.[6] Schell examined *Mafia Wars*, one of Zynga's first breakout hits, which, like *FarmVille*, attracted millions of players.

"There's definitely a lot of psychology here, because if someone had said, 'Hey, we're going to make a text-based mafia game that's going to make over $100 million,' you'd say, 'I don't think you'll do that.' Right?" Schell said, channeling the critics of the day who originally dismissed the free, primarily text-based online game. Yet Zynga used its understanding of human

psychology to build an irresistible product at the time.

Mafia Wars was among the first games to utilize information about players' Facebook friends. "It's not just a virtual world anymore. It's your real friends." Schell said. "And you're playing and it's kind of cool . . . but then, hey, hey, my real friend is better than me. How can I remedy that? Well, I can play a long time or I could just put twenty dollars in—*aha*! It's even better if that twenty dollars I put in validates something I know is true, that I am greater than my college roommate, Steve."

Schell went on, "Combine that with the psychological idea . . . of

rationalization, that anything you spend time on, you start to believe, 'This must be worthwhile. Why? Because I've spent time on it!' And therefore it must be worth me kicking in twenty dollars because look at the time I've spent on it. And now that I've kicked in twenty dollars, it must be valuable because only an idiot would kick in twenty dollars if it wasn't."

Schell's description of the quirky process of *Mafia Wars* rationalization helps demonstrate the strange logic of how we change our preferences. When players contemplate making a purchase, they acknowledge it is unwise to spend money on something that is not good. Yet just like the fox that perceives the grapes

as sour to reduce his frustration at not being able to reach them, players justify their purchases to help convince themselves of something they want to be true—namely, that they are not foolish. The only solution is to keep paying to keep playing.

The cognitive changes that lead to behavior change help power the shift in how we view the products and services we use. But how are habit-forming products designed for user investment? How can a product keep users committed to a service until it becomes a habit?

BITS OF WORK

In a standard feedback loop the cue, action, and reward cycle can change our immediate behavior. For example, a radar-equipped sign is an effective way to make drivers immediately slow down by showing them their car's speed relative to the posted speed limit.

Yet this pattern differs when it comes to how we form habits with products. The Hook Model is not just a framework for changing one-time behaviors; it is a design pattern to create unprompted

engagement in order to connect the user's problem to the designer's solution. To form the associations needed to create unprompted user engagement, something more than the three-step feedback loop is required.

The last step of the Hook Model is the *investment phase*, the point at which users are asked to do a bit of work. Here, users are prompted to put something of value into the system, which increases the likelihood of their using the product and of successive passes through the Hook cycle.

Unlike in the action phase of the Hook discussed

in chapter 3, investments are about the anticipation of longer-term rewards, not immediate gratification.

In Twitter, for example, the investment comes in the form of following another user. There is no immediate reward for following someone, no stars or badges to affirm the action. Following is an investment in the service, which increases the likelihood of the user checking Twitter in the future.

Also in contrast to the action phase, the investment phase increases friction. This certainly breaks conventional thinking in the product design community that all user

experiences should be as easy and effortless as possible. This approach still generally holds true, as does my advice in the action phase to make the intended actions as simple as possible. In the investment phase, however, asking users to do a bit of work comes *after* users have received variable rewards, not before. The timing of asking for user investment is critically important. By asking for the investment after the reward, the company has an opportunity to leverage a central trait of human behavior.

In an experiment conducted by Stanford

researchers, two groups of people were asked to complete a task with the help of computers.[7] The participants were initially asked to use their assigned computers to answer a series of questions. The computers provided to the first group were helpful when answering participants' questions, while those provided to the second group were programmed to be unhelpful, offering unclear answers. After completing the task, participants then switched roles and the machines began asking the people for assistance with their questions.

The study found that the

group given helpful computers performed almost twice as much work for their machines. The results showed that reciprocation is not just a characteristic expressed between people, but also a trait observed when humans interact with machines. Conceivably, we humans evolved the tendency to reciprocate kindness because it improved our species' ability to survive. As it turns out, we invest in products and services for the same reasons we put effort into our relationships.

The big idea behind the investment phase is to leverage the user's

understanding that the service will get better with use (and personal investment). Like a good friendship, the more effort people put in, the more both parties benefit.

Storing Value

Unlike physical goods in the real world, the software that runs our technology products can adapt itself to our needs. To become better with use, habit-forming technology utilizes investments users make in the product to enhance the experience.

The stored value users put into the product increases the likelihood they will use it again in the future and comes in a variety of forms.

Content

Every time users of Apple's iTunes add a song to their collection, they are strengthening ties to the service. The songs on a playlist are an example of how content increases the value of a service. Neither iTunes nor their users created the songs, yet the more content users add, the more valuable the music library becomes (figure 29).

By aggregating content with one

service, users can do more with their music and iTunes gets better with use by learning their preferences. With users' continued investment, more songs also become accessible on multiple Apple devices. In 2013 Apple revealed that its new iTunes Radio service would provide personalized music recommendations based on the kind of music in users' iTunes collections. The new feature provides yet another example of how technology adapts and improves based on users' investment.

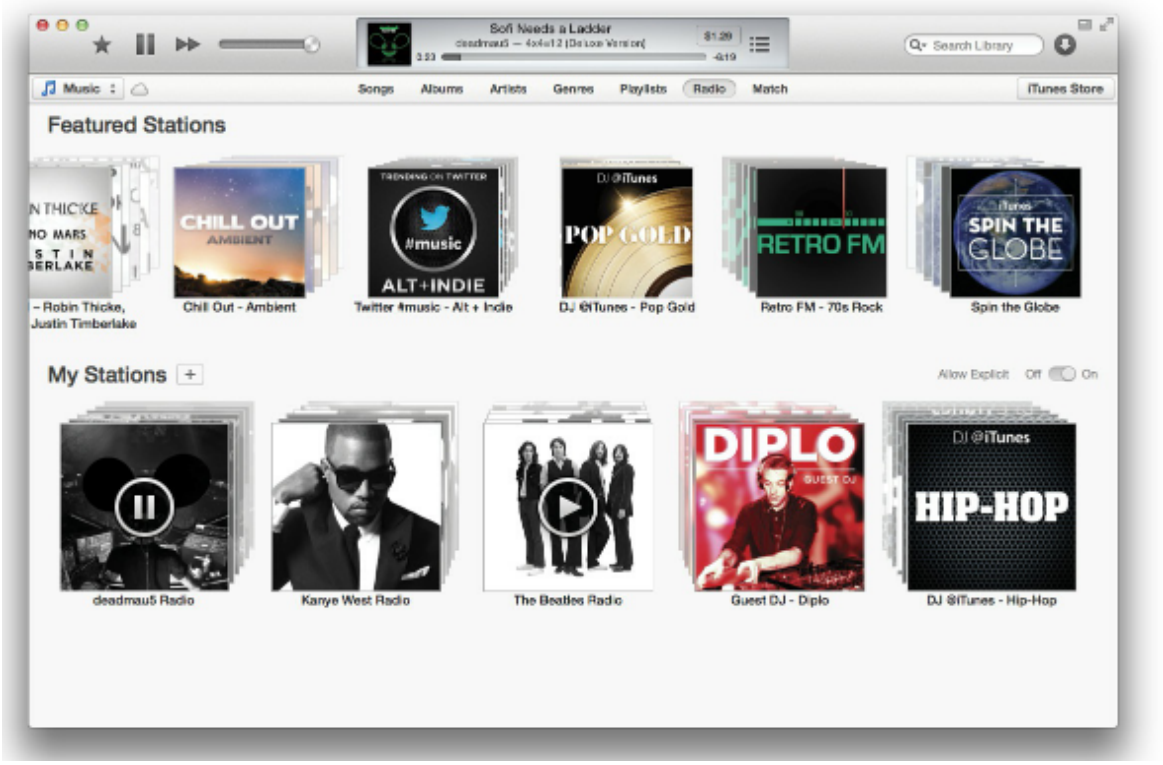

FIGURE 29

Content can also be created by a service's users. For example, every status update, "like," photo, or video shared on Facebook adds to the user's timeline, retelling the story of one's past experiences and relationships. As users continue to share and interact with

information on the service, their digital life is recorded and archived.

> *The collection of memories and experiences, in aggregate, becomes more valuable over time and the service becomes harder to leave as users' personal investment in the site grows.*

Data

Information generated, collected, or created by users (e.g., songs, photos, or news clippings) are examples of stored value in the form of content. Sometimes, though, users invest in a service by

either actively or passively adding their own personal data.

On LinkedIn the user's online résumé embodies the concept of data as stored value. Every time job seekers use the service, they are prompted to add more information.

The company found that the more information users invested in the site, the more committed they became to it.

As Josh Elman, an early senior product manager at the company, told me, "If we could get users to enter just a little information, they were much more likely to return." The tiny bit of effort

associated with providing more user data created a powerful hook to bring people back to the service.

Mint.com is an online personal finance tool used by millions of Americans. The service aggregates all of the user's accounts in one place, providing a complete picture of their financial life—but only if they invest their time and data in the service. Mint provides multiple opportunities for users to customize the site and make it more valuable with use. For example, the act of linking accounts, categorizing transactions, or creating a budget are all forms of investment. The more data collected, the more the service's stored value increases (figure 30).

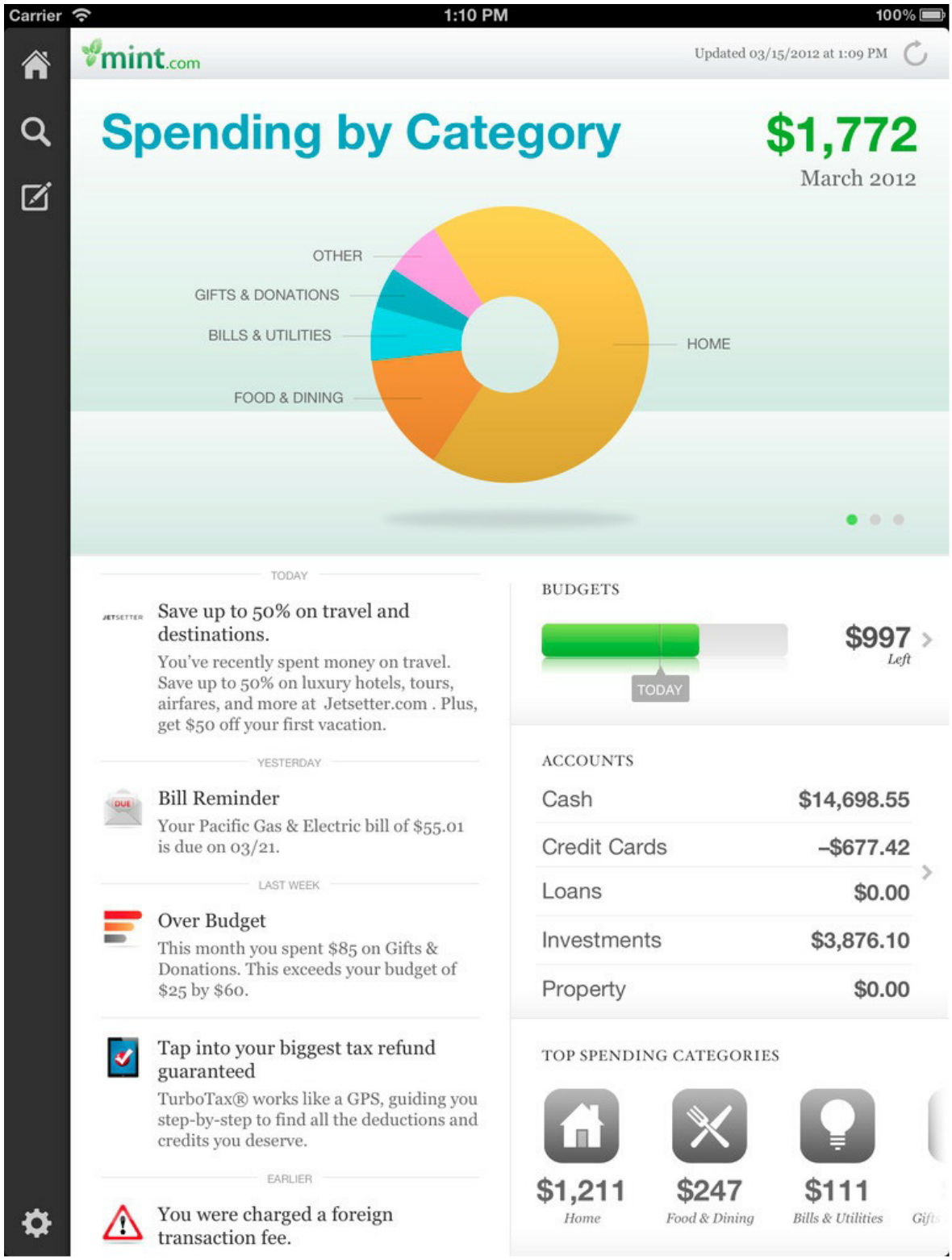
Carrier
1:10 PM
100%
mint.com
Updated 03/15/2012 at 1:09 PM
Spending by Category
$1,772
March 2012
OTHER
GIFTS & DONATIONS
BILLS & UTILITIES
FOOD & DINING
HOME
TODAY
Save up to 50% on travel and destinations.
You've recently spent money on travel. Save up to 50% on luxury hotels, tours, airfares, and more at Jetsetter.com . Plus, get $50 off your first vacation.
YESTERDAY
Bill Reminder
Your Pacific Gas & Electric bill of $55.01 is due on 03/21.
LAST WEEK
Over Budget
This month you spent $85 on Gifts & Donations. This exceeds your budget of $25 by $60.
Tap into your biggest tax refund guaranteed
TurboTax® works like a GPS, guiding you step-by-step to find all the deductions and credits you deserve.
EARLIER
You were charged a foreign transaction fee.
BUDGETS
$997
Left
TODAY
ACCOUNTS
Cash $14,698.55
Credit Cards –$677.42
Loans $0.00
Investments $3,876.10
Property $0.00
TOP SPENDING CATEGORIES
$1,211
Home
$247
Food & Dining
$111
Bills & Utilities

FIGURE 30

Followers

On the morning of Twitter's initial public offering on November 7, 2013, a news commentator on Bloomberg Television said that "the technology needed to build the company could be built in a day."[8] In fact, he was right. Twitter is a simple application. With a bit of basic programming know-how, anyone can build their very own clone of the multibillion-dollar social media behemoth.

In fact, several companies have tried to supplant the popular social network. One of the most notable attempts came from a disgruntled developer who decided to build App.net, an ad-free alternative that many tech industry

watchers argue is actually a better product. However, like other attempts to copy the service, App.net has failed to take off. Why is this?

Collecting people to follow on Twitter, as well as collecting followers, provides tremendous value and is a key driver of what keeps Twitter users hooked (figure 31).

From the follower side of the equation, the more Twitter users curate the list of people they follow, the better the service will be at delivering interesting content.

Investing in following the right people increases the value of the product by displaying more

relevant and interesting content in each user's Twitter feed. It also tells Twitter a lot about its users, which in turn improves the service overall.

FIGURE 31

For the tweeter seeking followers, the more followers one has, the more valuable the service becomes as well. Content creators on Twitter seek to reach as large an audience as possible. The only way to legitimately acquire new followers is to send tweets others think are interesting enough to warrant

following the sender. Therefore, to acquire more followers, content creators must invest in producing more—and better—tweets. The cycle increases the value of the service for both sides the more the service is used. For many users, switching services means abandoning years of investment and starting over. No one wants to rebuild a loyal following they have worked hard to acquire and nurture.

Reputation

Reputation is a form of stored value users can literally take to the bank. On online marketplaces such as eBay, TaskRabbit, Yelp, and Airbnb, people

with negative scores are treated very differently from those with good reputations. It can often be the deciding factor in what price a seller gets for an item on eBay, who is selected for a TaskRabbit job, which restaurants appear at the top of Yelp search results, and the price of a room rental on Airbnb.

On eBay both buyers and sellers take their reputations very seriously. The e-commerce giant surfaces user-generated quality scores for every buyer and seller, and awards its most active users with badges to symbolize their trustworthiness. Businesses with bad reputations find it difficult, if not impossible, to compete against highly rated sellers. Reputation is a form of

stored value that increases the likelihood of using a service.

Reputation makes users, both buyers and sellers, more likely to stick with whichever service they have invested their efforts in to maintain a high-quality score (figure 32).

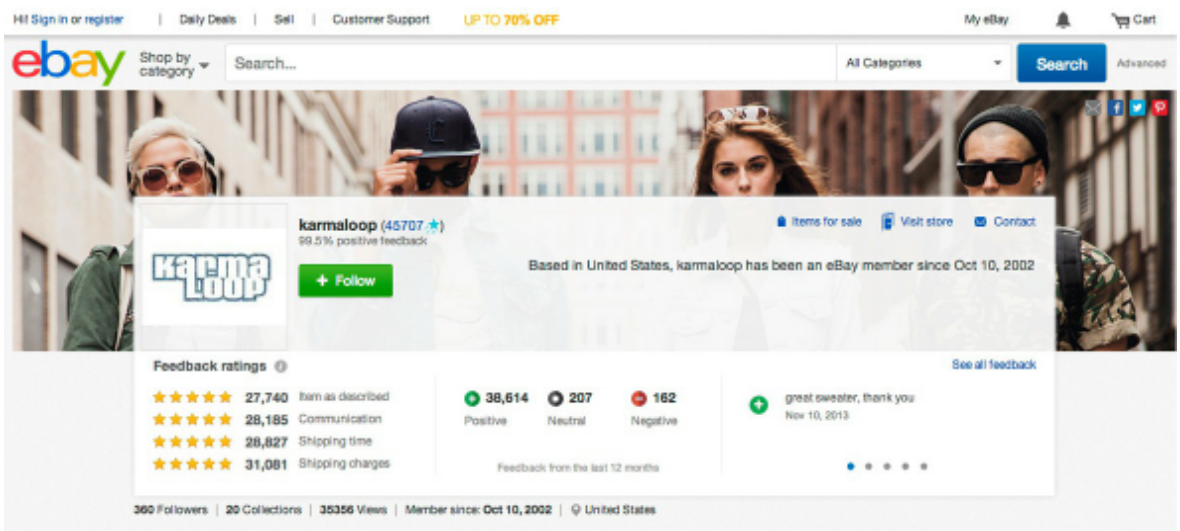

FIGURE 32

Skill

Investing time and effort into learning to use a product is a form of investment and stored value. Once a user has acquired a skill, using the service becomes easier and moves them to the right on the ability axis of the Fogg Behavior Model we discussed in chapter 3. As Fogg describes it, non-routine is a factor of simplicity, and the more familiar a behavior is, the more likely the user is to do it.

For example, Adobe Photoshop is the most widely used professional graphics editing program in the world. The software provides hundreds of advanced features for creating and manipulating images. Learning the

program is difficult at first, but as users become more familiar with the product—often investing hours watching tutorials and reading how-to guides—their expertise and efficiency using the product improves. They also achieve a sense of mastery (rewards of the self, as discussed in chapter 4). Unfortunately for the design professional, most of this acquired knowledge by users does not translate to competing applications.

> *Once users have invested the effort to acquire a skill, they are less likely to switch to a competing product.*

Like every phase in the Hook Model, the

investment phase requires careful use. It is not a *carte blanche* tool for asking users to do onerous tasks. In fact, quite the opposite. Just as in the action phase described in chapter 3, to achieve the intended behavior in the investment phase, the product designer must consider whether users have sufficient motivation and ability to engage in the intended behavior. If users are not doing what the designer intended in the investment phase, the designer may be asking them to do too much. I recommend that you progressively stage the investment you want from users into small chunks of work, starting with small, easy tasks and building up to harder tasks during successive cycles

through the Hook Model.

As we have just seen, users store value in the service during the investment phase. However, one other key opportunity found in the investment phase greatly increases the likelihood of users returning.

Loading the Next Trigger

As described in chapter 2, triggers bring users back to the product. Ultimately, habit-forming products create a mental association with an internal trigger. Yet to create the habit, users must first use the product through multiple cycles of the Hook Model. Therefore, external

triggers must be used to bring users back around again to start another cycle.

> *Habit-forming technologies leverage the user's past behavior to initiate an external trigger in the future.*

Users set future triggers during the investment phase, providing companies with an opportunity to reengage the user. We will now explore a few examples of how companies have helped load the next trigger during the investment phase.

1. Any.do

User retention is a challenge for any business, but especially for consumer mobile applications. According to a study by a mobile analytics firm, 26 percent of mobile apps in 2010 were downloaded and used only once.[9] Further data suggests people are using more applications but engaging with them less frequently.[10]

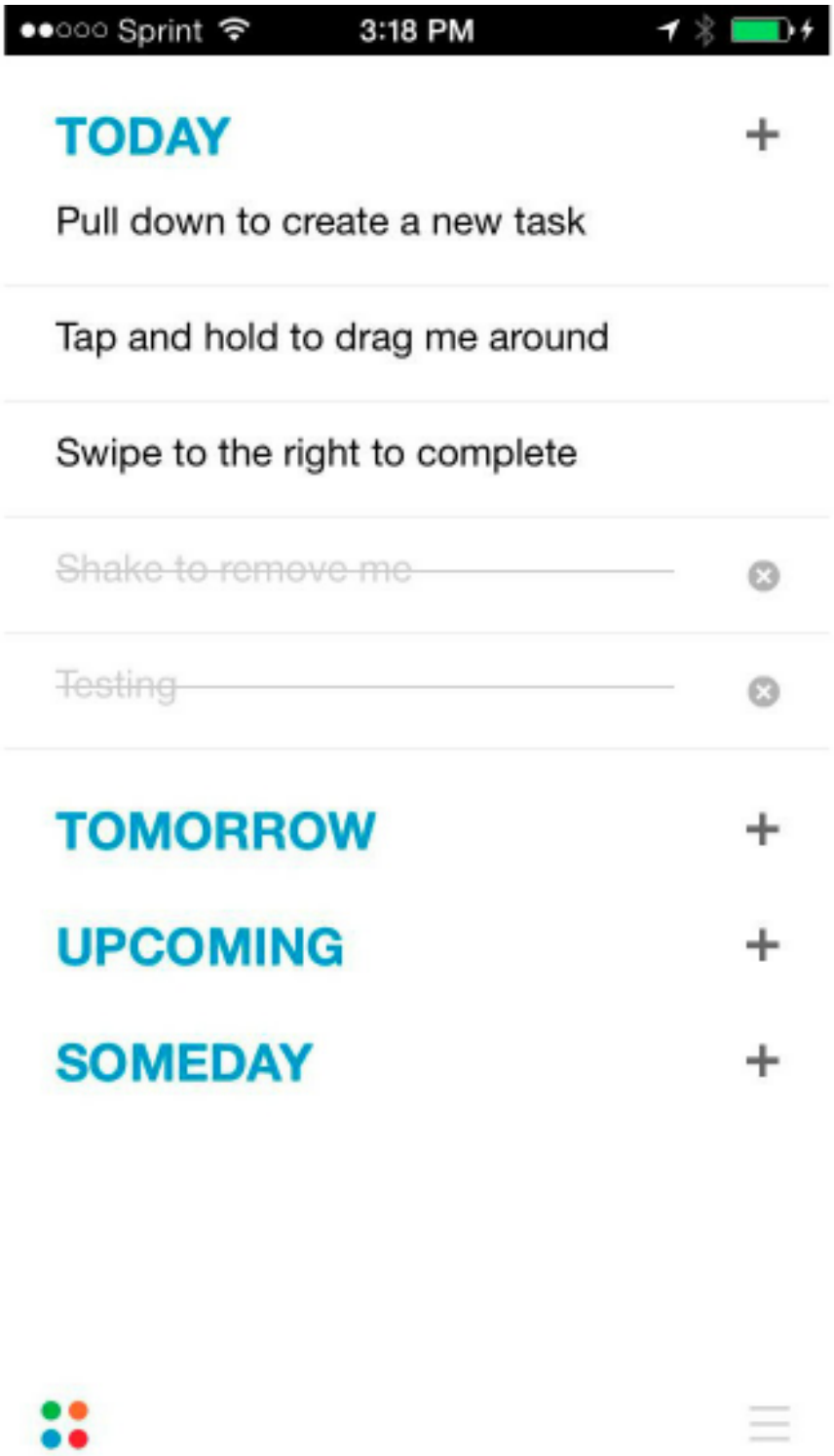

FIGURE 33

Any.do is a simple mobile task-

management app used to record to-do items such as picking up dry cleaning, restocking the fridge with milk, or calling Mom. Recognizing the challenge of retaining fickle mobile consumers, the app is designed to direct users to invest early on. During the first use of the app, Any.do elegantly teaches how to use the product (figure 33). The trigger comes in the form of the app's clear, easy-to-follow instructions. The follow-up action is doing what the app tells the user to do. The variable rewards arrive in the form of a congratulatory message and the satisfaction of mastering the app.

The investment comes next. Newcomers are instructed to connect the app to their calendar service, granting

Any .do access to the user's schedule. In doing so, users give the app permission to send a notification after the next scheduled meeting ends. This external trigger prompts users to return to the app to record a follow-up task from the meeting they just attended. In the Any.do scenario the app sends an external trigger to users at the moment when they are most likely to experience the internal trigger of anxiety about forgetting to do a task after a meeting. The Any.do app has anticipated a need and sets users up for success.

2. Tinder

In mid-2013 a hot new company entered

the hypercompetitive online dating market. Tinder quickly captured the attention of millions of people looking for love with a simple interface, generating 3.5 million matches from 350 million swipes each day.[11]

After launching the mobile app and logging in with Facebook, users browse profiles of other singles. Each potential match is presented as a card. Swipe left if you are not interested, right if that special someone catches your fancy (figure 34). If both parties express interest, a match is made and a private chat connects the two potential lovebirds.

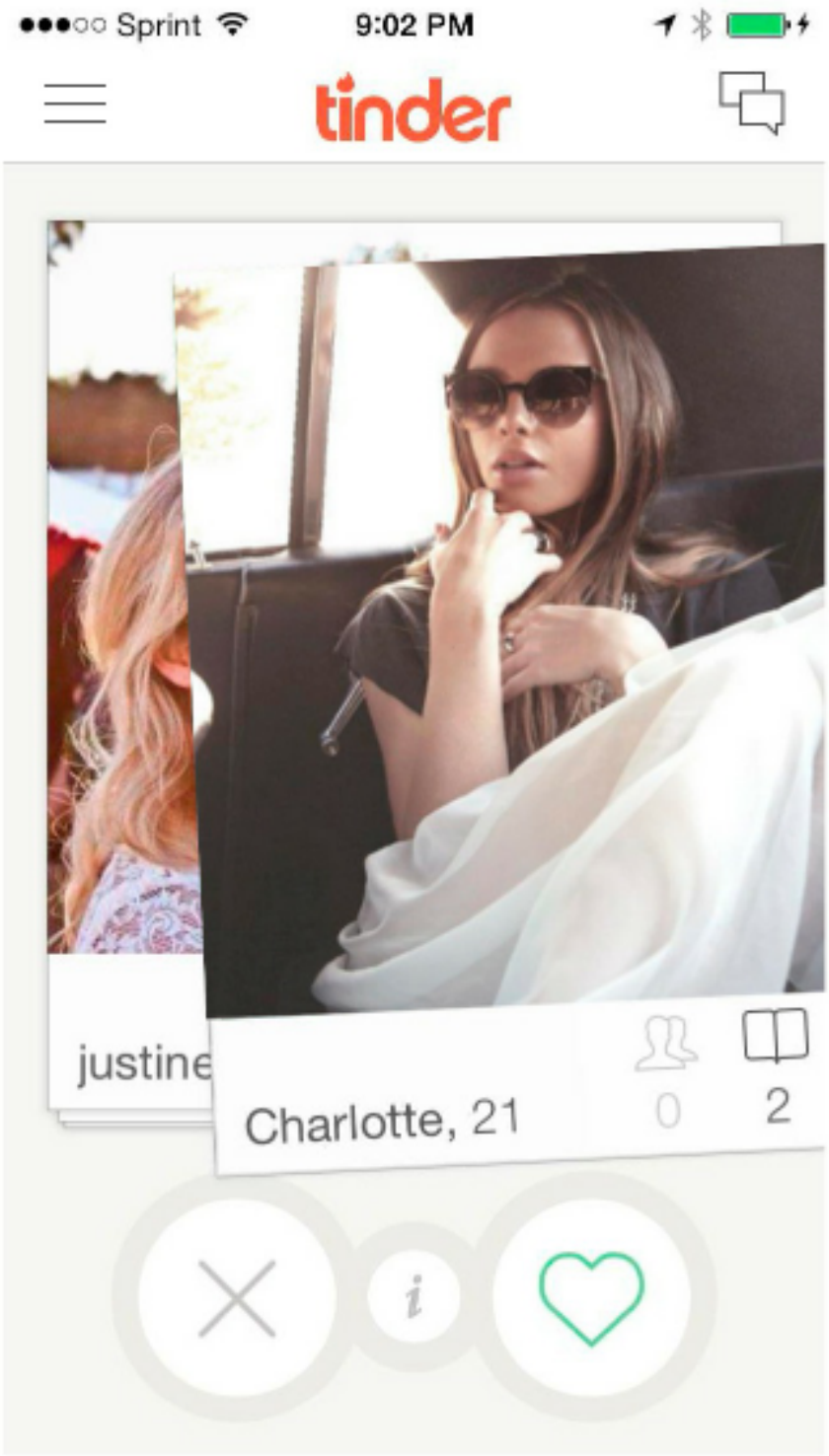

FIGURE 34

By simplifying the investment of

sorting through potential mates, Tinder makes loading the next trigger more likely with each swipe. The more swipes, the more potential matches are made; naturally, each match sends notifications to both interested parties.

3. Snapchat

As of June 2013, Snapchat, a popular photo-sharing app, boasted of 5 million daily active users collectively sending over 200 million photos and videos daily.[12] This tremendous engagement means an average Snapchat user sends forty photos every day!

Why are users so in love with Snapchat? Its success can largely be

attributed to the fact that users load the next trigger every time they use the service. Snapchat is more than a way to share images. It is a means of communication akin to sending a text message—with the added bonus of a built-in timer that can, based on the sender's instructions, cause the message to self-destruct after viewing. Users pass through the investment phase of the Hook Model each time they send a selfie, doodle, or goofy photo. Each photo or video sent contains an implicit prompt to respond; the Snapchat interface makes returning a pic incredibly easy by twice tapping the original message to reply. The self-destruct feature encourages timely responses, leading to a back-and-

forth relay that keeps people hooked into the service by loading the next trigger with each message sent.

4. Pinterest

Like many social networks, Pinterest loads the next trigger during the investment phase of the Hook. For many of the site's 50 million monthly users, the online pin board replaced the habit of browsing fashion-focused Web sites —and before the web, flipping through magazines and dog-earing favorite pages.[13]

The internal trigger for users is often boredom, for which the site offers a quick cure. Once registered, the only

action required of users is to start scrolling as Pinterest showcases a wealth of variable rewards. First, because Pinterest is a socially curated collection of interesting items, the site displays a powerful intermittent reward surrounding the hunt for objects of desire, even if they are only images. The site also provides a means of communicating with friends and people who share similar tastes. The rewards of the tribe come from the variability of posting images as a communication medium. A user might be curious to know what a friend has pinned not only because of the image itself, but because of her relationship with the pinner.

Finally, Pinterest users invest in the

site every time they pin an image of their own, repin someone else's image, comment on, or like a piece of content on the site (figure 35). Each of these tiny investments gives Pinterest data it can use to tailor the site to each user's individual taste; it also loads the next trigger. Each pin, repin, like, or comment gives Pinterest tacit permission to contact the user with a notification when someone else contributes to the thread, triggering the desire to visit the site again to learn more.

• • •

Pinterest clearly demonstrates the four stages of the Hook Model. It is a

seamless flow: from the itch of the internal trigger that moves users to the intended action, through the variable reward, and finally to the investment, which also loads the next external trigger. Pinterest users move through the Hook cycle from beginning to end, then happily return to the starting point for another go-round.

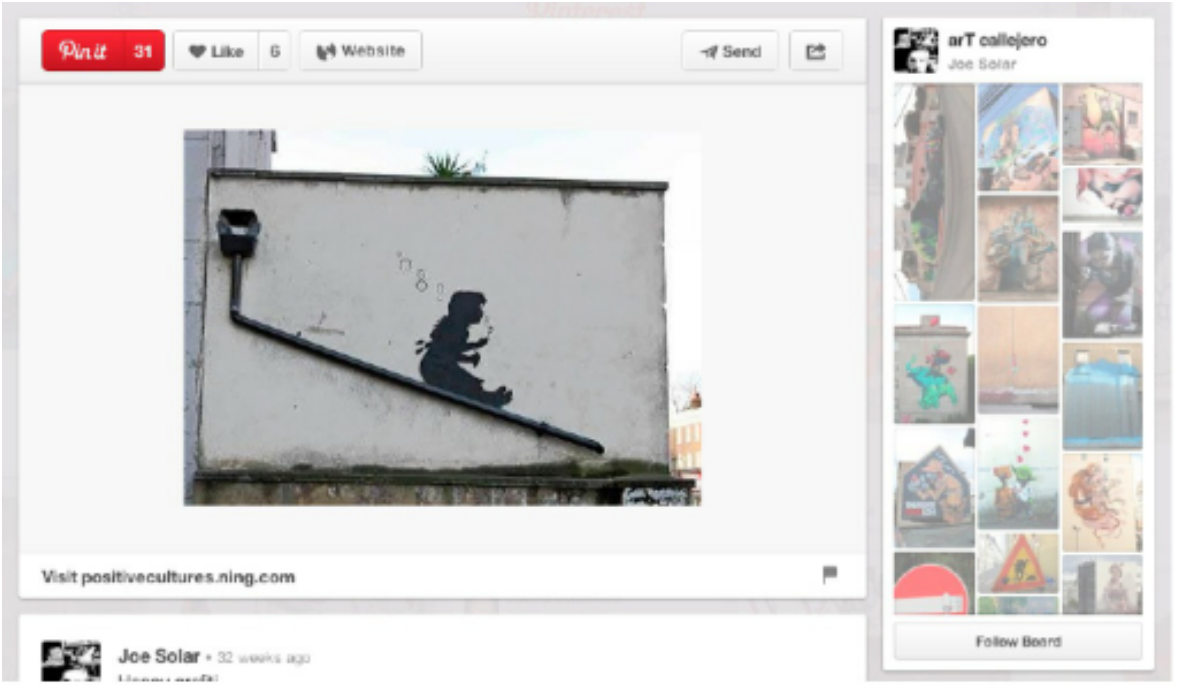

FIGURE 35

In this chapter we have learned how an investment in the product serves as the string that pulls the user back. To do this, the habit-forming technology increases the value of the product with each pass through the Hook. Through successive cycles of the Hook Model, users increase their affinity for the experience. They increasingly come to rely on the product as the solution to their problems until finally, the new habit—and routine—is formed.

The more users invest in a product through tiny bits of work, the more valuable the product becomes in their lives and the less they question its use.

Users do not stay hooked forever, though. Invariably, the next big thing will come along and provide a better, more compelling hook. However, by creating habits fueled by investments in a product or service, companies make switching to a competitor difficult. User habits are hard to break and confer powerful competitive advantages to any company fortunate enough to successfully create them.

REMEMBER & SHARE

- The *investment phase* is the fourth step in the Hook Model.

    - Unlike the action phase, which delivers immediate gratification, the investment phase concerns the anticipation of rewards in the future.

- Investments in a product create preferences because of our tendency to overvalue our work, be consistent with past behaviors, and avoid cognitive dissonance.

- Investment comes after the variable reward phase, when users are primed to reciprocate.

- Investments increase the

likelihood of users returning by improving the service the more it is used. They enable the accrual of stored value in the form of content, data, followers, reputation, or skill.

- Investments increase the likelihood of users passing through the Hook again by loading the next trigger to start the cycle all over again.

DO THIS NOW

Refer to the answers you came up with in the last “Do This

Now” section to complete the following exercises:

- Review your flow. What “bit of work” are your users doing to increase their likelihood of returning?
- Brainstorm three ways to add small investments into your product to:
  - Load the next trigger.
  - Store value as data, content, followers, reputation, and skill.
- Identify how long it takes for a “loaded trigger” to

reengage your users. How can you reduce the delay to shorten time spent cycling through the Hook?

6

What Are You Going to Do with This?

The Hook Model is designed to connect the user's problem with the designer's solution frequently enough to form a habit. It is a framework for building products that solve user needs through long-term engagement.

As users pass through cycles of the Hook Model, they learn to meet their

needs with the habit-forming product. Effective hooks transition users from relying upon external triggers to cueing mental associations with internal triggers. Users move from states of low engagement to high engagement, from low preference to high preference.

You are now equipped to use the Hook Model to ask yourself these five fundamental questions for building effective hooks:

1. What do users really want? What pain is your product relieving? (*Internal trigger*)
2. What brings users to your service? (*External*

trigger)

3. What is the simplest action users take in anticipation of reward, and how can you simplify your product to make this action easier? (*Action*)
4. Are users fulfilled by the reward yet left wanting more? (*Variable reward*)
5. What "bit of work" do users invest in your product? Does it load the next trigger and store value to improve the product with use? (*Investment*)

The Morality of Manipulation

Now that you're aware of the pattern for building habit-forming technology, how will you use this knowledge?

Perhaps while reading this book you asked yourself if the Hook Model is a recipe for manipulation. Maybe you felt a bit unsettled reading what seemed like a cookbook for mind control. If so, that is a very good thing.

The Hook Model is fundamentally about changing people's behaviors, but the power to build persuasive products should be used with caution.

Creating habits can be a force

for good, but it can also be used for nefarious purposes. What responsibility do product makers have when creating user habits?

Let's admit it: We are all in the persuasion business.[1] Innovators build products meant to persuade people to do what we want them to do. We call these people *users* and even if we don't say it aloud, we secretly wish every one of them would become fiendishly hooked to whatever we're making. I'm guessing that's likely why you started reading this book.

Users take their technologies with them to bed.[2] When they wake up, they

check for notifications, tweets, and updates, sometimes even before saying "Good morning" to their loved ones. Ian Bogost, the famed game creator and professor, calls the wave of habit-forming technologies the "cigarette of this century" and warns of their equally addictive and potentially destructive side effects.[3]

You may be asking, "When is it wrong to manipulate users?"

Manipulation is an experience crafted to change behavior—we all know what it feels like. We're uncomfortable when we sense someone is trying to make us do something we

wouldn't do otherwise, like when sitting through a car salesman's spiel or hearing a time-share presentation.

Yet manipulation doesn't always have a negative connotation. If it did, how could we explain the numerous multibillion-dollar industries that rely heavily on users' being willingly manipulated?

If manipulation is an experience crafted to change behavior, then Weight Watchers, one of the most successful mass-manipulation products in history, fits the definition.[4] Weight Watchers customers' decisions are programmed by the designer of the system, yet few question the morality of the business.

What, therefore, is the difference?

Why is manipulating users through flashy advertising or addictive video games thought to be distasteful while a strict system of food rationing is considered laudable? Although many people see Weight Watchers as an acceptable form of user manipulation, our moral compass has not caught up with what the latest technology now makes possible.

Ubiquitous access to the web, transferring greater amounts of personal data at faster speeds than ever before, has created a more potentially addictive world. According to famed Silicon Valley investor Paul Graham, we haven't had time to develop societal "antibodies to addictive new things."[5] Graham places responsibility on the user:

“Unless we want to be canaries in the coal mine of each new addiction—the people whose sad example becomes a lesson to future generations—we’ll have to figure out for ourselves what to avoid and how.”

What of the people, then, who make these manipulative experiences? After all, the corporations that unleash these habit-forming, at times downright addictive technologies are made up of human beings with a moral sense of right and wrong. They too have families and kids who are susceptible to manipulation. What shared responsibilities do we so-called growth hackers and behavior designers have to our users, to future generations, and to

ourselves?

With the increasing pervasiveness and persuasiveness of personal technology, some industry insiders have proposed creating an ethical code of conduct.[6] Others believe differently: Chris Nodder, author of the book *Evil by Design,* writes, "It's OK to deceive people if it's in their best interests, or if they've given implicit consent to be deceived as part of a persuasive strategy."[7]

I offer the Manipulation Matrix, a simple decision-support tool entrepreneurs, employees, and investors can use long before product is shipped or code is written. The Manipulation Matrix does not try to answer which

businesses are moral or which will succeed, nor does it describe what can and cannot become a habit-forming technology. The matrix seeks to help you answer not "Can I hook my users?" but instead "Should I attempt to?"

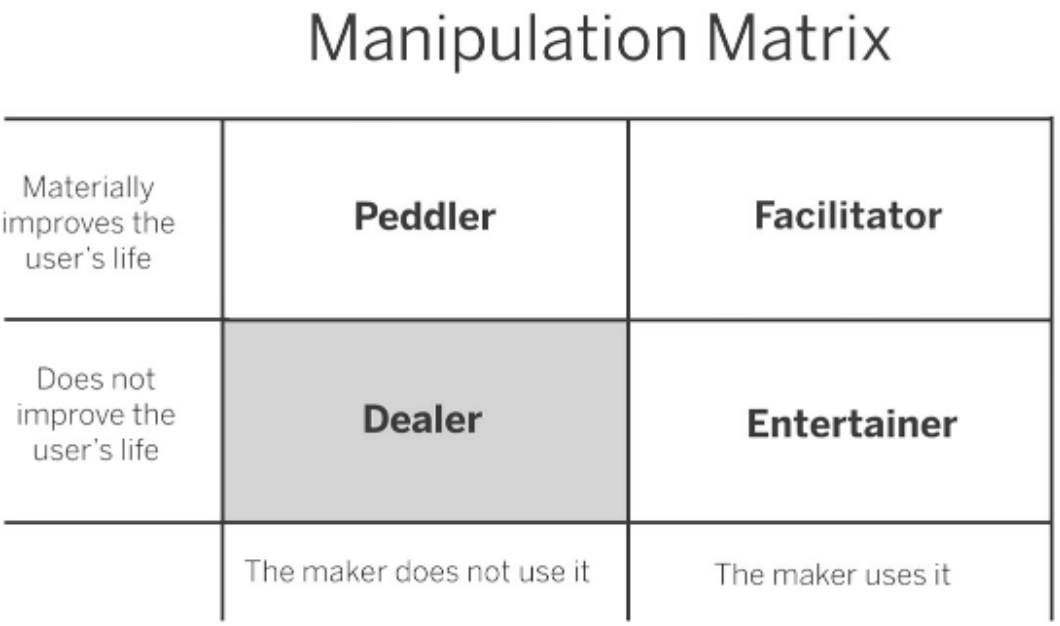

FIGURE 36

To use the Manipulation Matrix

(figure 36), the maker needs to ask two questions. First, “Would I use the product myself?” and second, “Will the product help users materially improve their lives?”

Remember, this framework is for creating habit-forming products, not one-time-use goods. Let’s explore the types of creators who represent the four quadrants of the Manipulation Matrix.

1. The Facilitator

When you create something that you would use, that you believe makes the user’s life better, you are facilitating a healthy habit. It is important to note that only you can decide if you would

actually use the product or service, and what "materially improving the life of the user" really means in light of what you are creating.

If you find yourself squirming as you ask yourself these questions or needing to qualify or justify your answers, *stop*! You failed. You have to truly want to use the product and believe it materially benefits your life as well as the lives of your users.

One exception is if you would have been a user in your younger years. For example, in the case of an education company, you may not need to use the service right now but are certain you would have used it in your not-so-distant past. Note, however, that the further you

are from your former self, the lower your odds of success.

In building a habit for a user other than you, you cannot consider yourself a facilitator unless you have experienced the problem firsthand.

Jake Harriman grew up on a small farm in West Virginia. After graduating from the United States Naval Academy, Harriman served as an infantry and special operations platoon commander in the Marine Corps. He was in Iraq during the 2003 invasion and led men into fierce gun battles with enemy combatants. He assisted with disaster relief in Indonesia and Sri Lanka after the 2004 Asian tsunami.

Harriman maintains that his

encounter with extreme poverty abroad changed his life. After seven and a half years of active duty, Harriman realized that guns alone could not stop terrorists intent on harming Americans. "Desperate people commit desperate acts," Harriman says. After his service Harriman founded Nuru International, a social venture targeting extreme poverty by changing the habits of people living in rural areas.

However, exactly how Harriman would change the lives of the poorest people in the world was not clear to him until he decided to live among them. In Kenya he discovered that basic practices of modern agriculture, like proper seed spacing, were still not used. Yet

Harriman knew that simply teaching farmers new behaviors would not be enough.

Instead, by drawing upon his own rural upbringing and experience living with the farmers, Harriman uncovered the obstacles in their way. He soon learned that the lack of access to financing for high-quality seeds and fertilizer kept farmers from utilizing yield-boosting techniques.

Nuru is currently equipping farmers in Kenya and Ethiopia, helping them rise out of grinding poverty. It was only by becoming one of his users that Harriman could design solutions to meet their needs.[8]

Although it is a long way from

Africa to Silicon Valley, the well-documented stories of the founders of Facebook and Twitter reveal they would likely see themselves as making products in the facilitator quadrant. A new breed of companies is now creating products to improve lives by implementing healthy habits. Whether getting users to exercise more, creating a habit of journaling, or improving back posture, these companies are run by authentic entrepreneurs who desperately want their products to exist, products that stem from a desire to satisfy their own needs.

However, what if the usage of a well-intended product becomes extreme, even harmful? What about the users who

go beyond forming habits and become full-fledged addicts?

First, it is important to recognize that the percentage of users who form a detrimental dependency is very small. Industry estimates for pathological users of even the most habit-forming technologies, such as slot-machine gambling, are just 1 percent.[9] Addiction tends to manifest in people with a particular psychological profile. However, simply brushing off the issue as too small to matter dismisses the very real problems caused by technology addiction.

For the first time though, companies have access to data that could be used to flag which users are using their products

too much. Whether companies choose to act on that data in a way that aids their users is naturally a question of corporate responsibility. Companies building habit-forming technologies have a moral obligation—and perhaps someday a legal mandate—to inform and protect users who are forming unhealthy attachments to their products. It would behoove entrepreneurs building potentially addictive products to set guidelines for identifying and helping addicted users.

Yet for the overwhelming majority of users, addiction to a product will never be a problem.

Even though the world is

becoming a potentially more addictive place, most people have the ability to self-regulate their behaviors.

The role of facilitator fulfills the moral obligation for entrepreneurs building a product they will themselves use and that they believe materially improves the lives of others. As long as they have procedures in place to assist those who form unhealthy addictions, the designer can act with a clean conscience. To take liberties with Mahatma Gandhi's famous quote, facilitators "*build* the change they want to see in the world."

2. The Peddler

Heady altruistic ambitions can at times outpace reality. Too often, designers of manipulative technology have a strong motivation to improve the lives of their users, but when pressed they admit they would not actually use their own creations. Their holier-than-thou products often try to "gamify" some task no one really wants to do by inserting run-of-the-mill incentives such as badges or points that don't actually hold value for their users.

Fitness apps, charity Web sites, and products that claim to suddenly turn hard work into fun often fall into this quadrant. Possibly the most common example of peddlers, though, is in

advertising.

Countless companies convince themselves they're making ad campaigns users will love. They expect their videos to go viral and their branded apps to be used daily. Their so-called reality distortion fields keep them from asking the critical question, "Would I actually find this useful?"[10] The answer to this uncomfortable question is nearly always no, so they twist their thinking until they can imagine a user they believe might find the ad valuable.

Materially improving users' lives is a tall order, and attempting to create a persuasive technology that you do not use yourself is incredibly difficult. This puts designers at a heavy disadvantage

because of their disconnect with their products and users. There's nothing immoral about peddling; in fact, many companies working on solutions for others do so out of purely altruistic reasons. It's just that the odds of successfully designing products for a customer you don't know extremely well are depressingly low.

> *Peddlers tend to lack the empathy and insights needed to create something users truly want.*

Often the peddler's project results in a time-wasting failure because the designers did not fully understand their

users. As a result, no one finds the product useful.

3. The Entertainer

Sometimes makers of products just want to have fun. If creators of a potentially addictive technology make something that they use but can't in good conscience claim improves users' lives, they're making entertainment.

Entertainment is art and is important for its own sake. Art provides joy, helps us see the world differently, and connects us with the human condition. These are all important and age-old pursuits. Entertainment, however, has particular attributes of which the

entrepreneur, employee, and investor should be aware when using the Manipulation Matrix.

Art is often fleeting; products that form habits around entertainment tend to fade quickly from users' lives. A hit song, repeated over and over again in the mind, becomes nostalgia after it is replaced by the next chart-topper. A book like this one is read and thought about for a while until the next interesting piece of brain candy comes along. As we learned in the chapter on variable rewards, games like *FarmVille* and *Angry Birds* engross users, but are then relegated to the gaming dustbin along with other hyper-addictive has-beens such as *Pac-Man* and *Mario Bros*.

Entertainment is a hits-driven business because the brain reacts to stimulus by wanting more and more of it, ever hungry for continuous novelty.

Building an enterprise on ephemeral desires is akin to running on an incessantly rolling treadmill: You have to keep up with the constantly changing demands of your users.

In this quadrant the sustainable business is not purely the game, the song, or the book—profit comes from an effective distribution system for getting those goods to market while they're still

hot, and at the same time keeping the pipeline full of fresh releases to feed an eager audience.

4. The Dealer

> *Creating a product that the designer does not believe improves users' lives and that he himself would not use is called exploitation.*

In the absence of these two criteria, presumably the only reason the designer is hooking users is to make a buck. Certainly, there is money to be made addicting users to behaviors that do little

more than extract cash; and where there is cash, there will be someone willing to take it.

The question is: Is that someone you? Casinos and drug dealers offer users a good time, but when the addiction takes hold, the fun stops.

In a satirical take on Zynga's *FarmVille* franchise, Ian Bogost created *Cow Clicker*, a Facebook game in which users did nothing but incessantly click on virtual cows to hear a satisfying *moo*.[11] Bogost intended to lampoon *FarmVille* by blatantly implementing the same game mechanics and viral hacks he thought would be laughably obvious to users. But after the app's usage exploded and some people became frighteningly

obsessed with the game, Bogost shut it down, bringing on what he called the "Cowpocalypse."[12]

Bogost rightfully compared addictive technology to cigarettes. Certainly, the incessant need for a smoke in what was once a majority of the adult U.S. population has been replaced by a nearly equal compulsion to constantly check our electronic devices. Yet unlike the addiction to nicotine, new technologies offer an opportunity to dramatically improve users' lives. Like all technologies, recent advances in the habit-forming potential of digital innovation have both positive and negative effects.

If the innovator has a clear

conscience that the product materially improves people's lives—first among them, the designer's—then the only path is to push forward. With the exception of the addicted 1 percent, users bear ultimate responsibility for their actions.

However, as the march of technology makes the world a potentially more addictive place, innovators need to consider their role. It will be years, perhaps generations, before society develops the mental antibodies to control new habits; in the meantime many of these behaviors may develop harmful side effects. For now, users must learn to assess these yet-unknown consequences for themselves, while creators will have to live with the moral

repercussions of how they spend their professional lives.

My hope is that the Manipulation Matrix helps innovators consider the implications of the products they create. Perhaps after reading this book, you'll start a new business. Maybe you'll join an existing company with a mission to which you are committed. Possibly, you will decide it is time to quit your job because you've come to realize it no longer points in the same direction as your moral compass.

REMEMBER & SHARE

- To help you, as a

designer of habit-forming technology, assess the morality behind how you manipulate users, it is helpful to determine which of the four categories your work fits into. Are you a facilitator, peddler, entertainer, or dealer?

- *Facilitators* use their own product and believe it can materially improve people's lives. They have the highest chance of success because they most closely understand the needs of their users.

- *Peddlers* believe their product can materially

improve people's lives but do not use it themselves. They must beware of the hubris and inauthenticity that comes from building solutions for people they do not understand firsthand.

- *Entertainers* use their product but do not believe it can improve people's lives. They can be successful, but without making the lives of others better in some way, the entertainer's products often lack staying power.

- *Dealers* neither use the product nor believe it

can improve people's lives. They have the lowest chance of finding long-term success and often find themselves in morally precarious positions.

DO THIS NOW

- Take a minute to consider where you fall on the Manipulation Matrix. Do you use your own product or service? Does it influence positive or negative behaviors? How does it make you feel? Ask yourself if you are proud of the way you

are influencing the behavior of others.

7

Case Study: The Bible App

In the previous chapter I urged you to be a facilitator and use the tools in this book to improve the lives of others. I encouraged you to align your work with a purpose that provides you with meaning and helps cultivate meaning for others. This is not only a moral imperative, it's good business practice.

The most highly regarded entrepreneurs are driven by meaning, a vision for greater good that drives them forward.

Start-ups are grueling and only the most fortunate persevere before finding success. If you only build for fame or fortune, you will likely find neither. Build for meaning, though, and you can't go wrong.

The Hook Model is a framework based on human psychology and a close examination of today's most successful habit-forming products. Now that you have an understanding of the model and the psychology behind why we do the things we do, let's study how it all

comes together in one of the world's most popular apps. Whether or not you agree with the mission of the app described below is unimportant. The lesson here is how a technology company created a user habit while staying true to the founder's moral calling.

It's not often an app has the power to keep someone out of a strip club. Yet according to Bobby Gruenewald, CEO of YouVersion, that's exactly what his technology did. Gruenewald says a user of his Bible verse app walked into a business of ill repute when suddenly, seemingly out of the heavens, he received a notification on his phone. "God's trying to tell me something!"

Gruenewald recalled the user saying. “I just walked into a strip club—and, man—the Bible just texted me!”

In July 2013 YouVersion announced a monumental milestone for the app, placing it in a rare strata of technology companies. The simply named Bible App has been downloaded to more than 100 million devices and is growing.[1] Gruenewald says a new install occurs every 1.3 seconds.

On average, sixty-six thousand people open the app every second—and sometimes the open rate is much higher. Every Sunday, Gruenewald says, preachers around the world tell congregants to “take out your Bibles or YouVersion app. And, we see a huge

spike."

The market for religious apps is fiercely competitive. A *Bible* word search in the Apple App Store returns 5,185 results. But among all the choices, YouVersion's Bible App seems to be the chosen one, ranking at the top of the list and boasting over 641,000 reviews.

How did YouVersion come to dominate the digital "word of God"? It turns out there is much more behind the app's success than missionary zeal. It's a case study of how technology can change behavior by marrying the principles of consumer psychology with the latest in big data analytics.

According to industry insiders, the YouVersion Bible could be worth a

bundle. Jules Maltz, who is the general partner at Institutional Venture Partners (IVP), told me, "As a rule of thumb, a company this size could be worth two hundred million dollars and up."

Maltz should know. His firm announced an investment in another pre-revenue app, Snapchat, at an $800 million valuation in July 2013.[2] Maltz justifies the price by pointing to the per-user valuations of other tech companies such as Facebook, Instagram, and Twitter, each of which commanded astronomical investment sums well before turning a profit. Maltz was quick to add, "Of course, this assumes the company can monetize through advertising."

In the Beginning

Gruenewald is a quick-thinking, fast-talking man. During our conversation he pulled up statistics in real time, stopping himself midsentence whenever relevant data flashed on his screen. As Gruenewald preaches on about best practices in mobile app development, I need to occasionally interrupt him to ask clarifying questions. My words stumble over his enthusiasm as he bears witness to what he's learned building his app. He spouts user retention figures with the same gusto I'd imagine he might proclaim scripture.

"Unlike other companies, when we started, we were not building a Bible

reader for seminary students. YouVersion was designed to be used by everyone, every day," Gruenewald says, attributing much of the app's success to a relentless focus on creating habitual Bible readers. The Bible App's success is broken down into the language of habit formation more commonly seen in psychology textbooks. The cues, behaviors, and rewards of communing with the Lord are bullet-pointed, ready for our discussion.

"Bible study guides are nothing new," Gruenewald says. "People have been using them with pen and paper long before we came along." But I soon find out, the Bible App is much more than a mobile study guide.

The first version of YouVersion, in fact, was not mobile at all. "We originally started as a desktop Web site, but that really didn't engage people in the Bible," explains Gruenewald. "It wasn't until we tried a mobile version that we noticed a difference in people, including ourselves, turning to the Bible more because it was on a device they always had with them."

This is not surprising. The Fogg Behavior Model (see chapter 3) notes that for an action to occur, users must receive a trigger and have sufficient motivation and ability to complete it. If any of these elements are missing or inadequate at the moment the trigger arises, the action will not occur.

The omnipresence of Bible App makes it far more accessible than its Web site predecessor, giving users the ability to open the mobile app when triggered by the pastor's instructions or when feeling inspired at other moments throughout their day. Its users take it everywhere, reading the scripture in even the most unsanctified places. The company revealed that 18 percent of readers report using the Bible App in the bathroom.[3]

How to Form a God Habit

Gruenewald acknowledges his Bible App enjoyed the good fortune of being

among the first of its kind at the genesis of Apple's App Store in 2008. To take advantage of this newly established marketplace, Gruenewald quickly converted his Web site into a mobile app optimized for reading. The app caught the rising tide, but soon a wave of competition followed. If his app was to reign supreme, Gruenewald needed to get users hooked quickly.

That's when Gruenewald says he implemented a plan—actually, many plans. A signature of the Bible App is its selection of over four hundred reading plans—a devotional iTunes of sorts, catering to an audience with diverse tastes, troubles, and tongues. Given my personal interest and research into habit-

forming technology, I decided to start a Bible-reading plan of my own. A plan titled "Addictions" seemed appropriate.

For those who have yet to form a routine around biblical study, reading plans provide structure and guidance. "Certain sections of the Bible can be difficult for people to get through," Gruenewald admits. "By offering reading plans with different small sections of the Bible each day, it helps keep [readers] from giving up."

The app chunks out and sequences the text by separating it into bite-size pieces.

By parsing readings into digestible communion wafer–size portions, the app focuses the reader's brain on the small task at hand while avoiding the intimidation of reading the entire book.

Holy Triggers

Five years of testing and tinkering have helped Gruenewald's team discover what works best. The Bible App's reading plans are now tuned to immaculate perfection, and Gruenewald has learned that frequency of use is paramount: "We've always focused on daily reading. Our entire structure for plans focuses on daily engagement."

To get users to open the app every day, Gruenewald makes sure he sends effective cues—like the notification sent to the sinner in the strip club. Gruenewald admits, though, that he stumbled upon the power of good triggers. “At first we were very worried about sending people notifications. We didn’t want to bother them too much.”

To test how much of a cyber cross users were willing to bear, Gruenewald decided to run an experiment. “For Christmas, we sent people a message from the app. Just a ‘Merry Christmas’ in various languages.” The team was prepared to hear from disgruntled users annoyed by the message. “We were afraid people would uninstall the app,”

Gruenewald says. “But just the opposite happened. People took pictures of the notification on their phones and started sharing them on Instagram, Twitter, and Facebook. They felt God was reaching out to them.” Today, Gruenewald says, triggers play an important role in every reading plan.

On my own plan, I receive a daily notification—an owned external trigger—on my phone. It simply says, “Don’t forget to read your Addictions reading plan.” Ironically, the addiction I’m trying to cure is my dependency on digital gadgetry, but what the hell, I’ll fall off the wagon just this once.

In case I somehow avoid the first message, a red badge over a tiny Holy

Bible icon on my phone cues me again. If I forget to start the first day of a plan, I'll receive a message suggesting that perhaps I should try a different, less-challenging plan. I also have the option of receiving verse through e-mail. And if I slip up and miss a few days, another e-mail reminds me to get back on track.

The Bible app also comes with a virtual congregation of sorts. Members of the site tend to send encouraging words to one another, delivering even more triggers. According to the company's publicist, "Community e-mails can serve as a nudge to open the app." These relationship-based external triggers are everywhere in the Bible app and are one of the keys to keeping users

engaged.

Glory Be in the Data

Gruenewald's team sifts through behavioral data collected from millions of readers to better understand what users want from the app. "We just have so much data flowing through our system," Gruenewald says. The data reveals important insights on what drives user retention. High on the list of findings is the importance of ease of use, which came up throughout our conversation.

In line with the work of psychologists from early Gestalt

psychologist Kurt Lewin to modern-day researchers, the app uses the principle that by making an intended action easier to do, people will do it more often.

The Bible App is designed to make absorbing the Word as frictionless as possible. For example, to make the Bible App habit easier to adopt, users who prefer listening over reading can simply tap a small icon to play an audio track read with the dramatic bravado of Charlton Heston himself.

Gruenewald says his data also revealed that changing the order of the Bible by placing the more interesting sections up front and saving the boring bits for later increased completion rates. Furthermore, daily reading plans are

kept to a simple inspirational thought and a few short verses for newcomers. The idea is to get neophytes into the ritual for a few minutes each day until the routine becomes a facet of their everyday lives.

Rewards from the Lord

Gruenewald says the connection people have with scripture taps into deep emotions that "we need to use responsibly." Readers who form a habit of using the app turn to it not only when they see a notification on their phone, but also whenever they feel low and need a way to lift their spirits.

"We believe that the Bible is a way God speaks to us," Gruenewald says. "When people see a verse, they see wisdom or truth they can apply to their lives or a situation they're going through." Skeptics might call this subjective validation, and psychologists term it *the Forer effect*, but to the faithful it amounts to personally communicating with God.

Upon opening the Bible App, I find a specially selected verse waiting for me on the topic of "Addictions." With just two taps I'm reading 1 Thessalonians 5:11—encouragement for the "children of the day," imploring them with the words, "let us be sober." It's easy to see how these comforting words could serve

as a sort of prize wrapped inside the app, helping readers feel better.

Gruenewald says his Bible App also offers an element of mystery and variability. “One woman would stay up until just past midnight to know what verse she had received for her next day,” Gruenewald says. The unknown—in this case, which verse will be chosen for the reader and how it relates to their personal struggle—becomes an important driver of the reading habit.

As for my own reward, after finishing my verse, I received affirmation from a satisfying “Day Complete!” screen. A check mark appeared near the scripture I had read and another one was placed on my

reading plan calendar. Skipping a day would mean breaking the chain of checked days, employing the endowed progress effect (previously discussed in chapter 3)—a tactic also used by video game designers to encourage progression.

As habit forming as the Bible App's reading plans can be, they are not for everyone. In fact, Gruenewald reports most users downloaded the app but never register for an account with YouVersion. Millions choose to not follow any plan, opting instead to use the app as a substitute for their paper Bibles. But to Gruenewald, using the app in this way suits him fine. Unregistered readers are still helping to

grow the app. In fact, social media is abuzz with the two hundred thousand pieces of content shared from the app every twenty-four hours.

To help spread the app, a new verse greets the reader on the first page. Below the verse a large blue button reads "Share Verse of the Day." One click and the daily scripture is blasted to Facebook or Twitter.

The drivers behind recently read scripture have not been widely studied. However, one reason may be the reward of portraying oneself in a positive light, also known as the *humblebrag*.[4] A Harvard meta-analysis, "Disclosing information about the self is intrinsically rewarding," found the act "engages

neural and cognitive mechanisms associated with reward."[5] In fact, sharing feels so good that one study found "individuals were willing to forgo money to disclose about the self."

There are many opportunities to share verse from within the Bible App, but one of Gruenewald's most effective distribution channels is not online but in row—that is, the pews where churchgoers sit side by side every week.

"People tell each other about the app because they use it surrounded by people who ask about it," Gruenewald says. The app always sees a spike in new downloads on Sundays when people are most likely to share it through word of mouth.

However, nothing signals the reign of Gruenewald's Bible App quite like the way some preachers have come to depend upon it. YouVersion lets religious leaders input their sermons into the app so their congregants can follow along in real time—book, verse, and passage—all without flipping a page. Once the head of the church is hooked, the congregation is sure to follow.

Using the Bible App at church not only has the benefit of driving growth, it also builds commitment. Every time users highlight a verse, add a comment, create a bookmark, or share from the app, they invest in it.

As described in chapter 5, Dan Ariely and Michael Norton have shown

the effect small amounts of work have on the way people value various products. This so-called IKEA effect illustrates the connection between labor and perceived worth.

It is reasonable to think that the more readers put into the Bible App in the form of small investments, the more it becomes a repository of their history of worship. Like a book that is dog-eared and filled with scribbled insights and wisdom, the app becomes a treasured asset that won't easily be discarded. The more readers use the Bible App, the more valuable it becomes to them. Switching to a different digital Bible—God forbid—becomes less likely with each new revelation users type into (or

extract from) the app, further securing YouVersion's dominion.

Gruenewald claims he is not in competition with anyone, but he does on occasion rattle off app store categories where his Bible App holds a high ranking. His app's place at the top of the charts appears secure now that the Bible has crossed its hundred millionth install. Yet Gruenewald plans to continue sifting through the terabytes of data in search of new ways to increase the reach of his app and make his version of the Bible even more habit-forming. To its tens of millions of regular users, Gruenewald's app is a Godsend.

REMEMBER & SHARE

- The Bible App was far less engaging as a desktop Web site; the mobile interface increased accessibility and usage by providing frequent triggers.
- The Bible App increases users' ability to take action by front-loading interesting content and providing an alternative audio version.
- By separating the verses into small chunks, users

find the Bible easier to read on a daily basis; not knowing what the next verse will be adds a variable reward.

- Every annotation, bookmark, and highlight stores data (and value) in the app, further committing users.

8

Habit Testing and Where to Look for Habit-Forming Opportunities

Now that you have an understanding of the Hook Model and have reflected on the morality of influencing user behavior, it is time to get to work.

Running your idea through the four phases of the model will help you discover potential weaknesses in your product's habit-forming potential.

Does your users' internal trigger frequently prompt them to action? Is your external trigger cueing them when they are most likely to act? Is your design simple enough to make taking the action easy? Does the reward satisfy your users' need while leaving them wanting more? Do your users invest a bit of work in the product, storing value to improve the experience with use and loading the next trigger?

By identifying where your technology is lacking, you can focus on developing improvements to your

product where it matters most.

Habit Testing

By following the "Do This Now" sections in previous chapters, you should have enough knowledge to prototype your product. But simply coming up with ideas is not enough, and creating user habits is often easier said than done. The process of developing successful habit-forming technologies requires patience and persistence.

> *The Hook Model can be a helpful tool for filtering out bad ideas with low habit*

potential as well as a framework for identifying room for improvement in existing products.

However, after the designer has formulated new hypotheses, there is no way to know which ideas will work without testing them with actual users.

Building a habit-forming product is an iterative process and requires user-behavior analysis and continuous experimentation.

How can you implement the

concepts in this book to measure your product's effectiveness in building user habits?

Through my studies and discussions with entrepreneurs at today's most successful habit-forming companies, I've distilled this process into what I term *Habit Testing*. It is a process inspired by the "build, measure, learn" methodology championed by the lean start-up movement. Habit Testing offers insights and actionable data to inform the design of habit-forming products. It helps clarify who your devotees are, what parts (if any) of your product are habit forming, and why those aspects of your product are changing user behavior.

Habit Testing does not always

require a live product; however, it can be difficult to draw clear conclusions without a comprehensive view of how people are using your system. The following steps assume you have a product, users, and meaningful data to explore.

Step 1: Identify

The initial question for Habit Testing is "Who are the product's habitual users?" Remember, the more frequently your product is used, the more likely it is to form a user habit.

> *First, define what it means to be a* devoted user. *How often*

"should" one use your product?

The answer to this question is very important and can widely change your perspective. Publicly available data from similar products or solutions can help define your users and engagement targets. If data are not available, educated assumptions must be made—but be realistic and honest.

If you are building a social networking app like Twitter or Instagram, you should expect habitual users to visit the service multiple times per day. On the other hand, you should not expect users of a movie recommendation site like Rotten

Tomatoes to visit more than once or twice a week (because their visits will come on the heels of seeing a movie or researching one to watch). Don't come up with an overly aggressive prediction that only accounts for überusers; you are looking for a realistic guess to calibrate how often typical users will interact with your product.

Once you know how often users *should* use your product, dig into the numbers to identify how many and which type of users meet this threshold. As a best practice, use cohort analysis to measure changes in user behavior through future product iterations.

Step 2: Codify

Let's say that you've identified a few users who meet the criteria of habitual users. Yet how many such users are enough? My rule of thumb is 5 percent. Though your rate of active users will need to be much higher to sustain your business, this is a good initial benchmark.

However, if at least 5 percent of your users don't find your product valuable enough to use as much as you predicted they would, you may have a problem. Either you identified the wrong users or your product needs to go back to the drawing board. If you have exceeded that bar, though, and identified your habitual users, the next step is to

codify the steps they took using your product to understand what hooked them.

Users will interact with your product in slightly different ways. Even if you have a standard user flow, the way users engage with your product creates a unique fingerprint. Where users are coming from, decisions made when registering, and the number of friends using the service are just a few of the behaviors that help create a recognizable pattern. Sift through the data to determine if similarities emerge.

> *You are looking for a* Habit Path *—a series of similar actions shared by your most loyal users.*

For example, in its early days, Twitter discovered that once new users followed thirty other members, they hit a tipping point that dramatically increased the odds they would keep using the site.[1]

Every product has a different set of actions that devoted users take; the goal of finding the Habit Path is to determine which of these steps is critical for creating devoted users so that you can modify the experience to encourage this behavior.

Step 3: Modify

Armed with new insights, it is time to revisit your product and identify ways to nudge new users down the same Habit

Path taken by devotees. This may include an update to the registration funnel, content changes, feature removal, or increased emphasis on an existing feature. Twitter used the insights gained from the previous step to modify its on-boarding process, encouraging new users to immediately begin following others.

Habit Testing is a continual process you can implement with every new feature and product iteration.

> *Tracking users by cohort and comparing their activity with that of habitual users should guide how products evolve and improve.*

Discovering Habit-forming Opportunities

The Habit Testing process requires the product designer to have an existing product to test. Where, though, might you look to find potentially habit-forming experiences ripe for new technological solutions?

When it comes to developing new products, there are no guarantees. Along with creating an engaging product as described in this book, start-ups must also find a way to monetize and grow. Although this book does not cover business models for delivering customer value or methods for profitable customer acquisition, both are necessary

components of any successful business. Several things must go right for a new company to succeed, and forming user habits is just one of them.

As we saw in chapter 6, being a facilitator is not only a moral imperative, it also makes for better businesses practices. Creating a product the designer uses and believes materially improves people's lives increases the odds of delivering something people want. Therefore, the first place for the entrepreneur or designer to look for new opportunities is in the mirror. Paul Graham advises entrepreneurs to leave the sexy-sounding business ideas behind and instead build for their own needs: "Instead of asking

‘what problem should I solve?’ ask ‘what problem do I wish someone else would solve for me?’”[2]

> *Studying your own needs can lead to remarkable discoveries and new ideas because the designer always has a direct line to at least one user: him- or herself.*

For example, Buffer, a service for posting updates to social networks, was inspired by its founder’s insightful observations of his own behavior.

Buffer was founded in 2010 and is now used by over 1.1 million people.[3]

Its founder, Joel Gascoigne, described the company's inception in an interview.[4] "The idea for Buffer came to me after I had been using Twitter for about 1.5 years. I had started to share links to blog posts and quotes I found inspiring, and I found that my followers seemed to really like these types of tweets. I would often get retweets or end up having a great conversation around the blog post or quote. That's when I decided I wanted to share this kind of content more frequently, because the conversations being triggered were allowing me to be in touch with some super smart and interesting people."

Gascoigne continues, "So, with my goal of sharing more blog posts and

quotes, I started to do it manually. I quickly realized that it would be far more efficient to schedule these tweets for the future, so I started to use a few available Twitter clients to do this. The key pain I ran into here was that I would have to choose the exact date and time for the tweet, and in reality all I wanted to do was to tweet 'five times per day.' I just wanted the tweets to be spread out so I didn't share them all at the same time when I did my daily reading. For a while, I used a notepad and kept track of when I had scheduled tweets, so that I could try and tweet five times per day. This became quite cumbersome, and so my idea was born: I wanted to make scheduling tweets 'x times a day' as easy

as tweeting regularly."

Gascoigne's story is a classic example of a founder scratching his own itch. As he used existing solutions, he recognized a discrepancy in what they offered and the solution he needed. He identified where steps could be removed from other products he used and built a simpler way to get his job done.

Careful introspection can uncover opportunities for building habit-forming products.

As you go about your day, ask yourself why you do or do not do certain things and how those tasks could be made easier or more rewarding.

Observing your own behavior can inspire the next habit-forming product or inform a breakthrough improvement to an existing solution. Read on to find other hotbeds for innovation opportunities—think of them as shortcuts for uncovering existing behaviors that are ripe for successful business development based on forming new user habits.

Nascent Behaviors

Sometimes technologies that appear to cater to a niche will cross into the mainstream. Behaviors that start with a small group of users can expand to a

wider population, but only if they cater to a broad need. However, the fact that the technology is at first used only by a small population often deceives observers into dismissing the product's true potential.

A striking number of world-changing innovations were written off as mere novelties with limited commercial appeal. George Eastman's Brownie camera, preloaded with a film roll and selling for just $1, was originally marketed as a child's toy.[5] Established studio photographers saw the device as little more than a cheap plaything.

The invention of the telephone was also dismissed at first. Sir William Henry Preece, the chief engineer of the

British post office, famously declared, "The Americans have need of the telephone, but we do not. We have plenty of messenger boys."[6]

In 1911 Ferdinand Foch, the future commander in chief of the Allied forces in World War I, said, "Airplanes are interesting toys but of no military value."[7]

In 1957 the editor of business books for Prentice Hall told his publisher, "I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year."

The Internet itself, and each successive wave of innovation, has

continually received criticism for its inability to gain mass appeal. In 1995 Clifford Stoll wrote a *Newsweek* article, "The Internet? Bah!" in which he declared, "The truth is no online database will replace your daily newspaper." Stoll continued, "We'll soon buy books and newspapers straight over the Internet. Uh, sure."[8]

Naturally, now we do read books and newspapers over the Internet. When technologies are new, people are often skeptical. Old habits die hard and few people have the foresight to see how new innovations will eventually change their routines. However, by looking to early adopters who have already developed nascent behaviors,

entrepreneurs and designers can identify niche use cases, which can be taken mainstream.

For example, in its early days, Facebook was only used by Harvard students. The service mimicked an off-line behavior familiar to all college students at the time: perusing a printed book of student faces and profiles. After finding popularity at Harvard, Facebook rolled out to other Ivy League schools, then to college students nationwide. Next came high school kids and later, employees at select companies. Finally, in September 2006, Facebook was opened to the world. Currently, over a billion people use Facebook. What first began as a nascent behavior at one

campus became a global phenomenon catering to the fundamental human need for connection to others.

As discussed in the first chapter, many habit-forming technologies begin as vitamins—nice-to-have products that, over time, become must-have painkillers by relieving an itch or pain. It is revealing that so many breakthrough technologies and companies, from airplanes to Airbnb, were at first dismissed by critics as toys or niche markets. Looking for nascent behaviors among early adopters can often uncover valuable new business opportunities.

Enabling Technologies

Mike Maples Jr., a Silicon Valley "super angel" investor, likens technology to big-wave surfing. In 2012 Maples blogged, "In my experience, every decade or so, we see a major new tech wave. When I was in high school, it was the PC revolution. I made my career as an entrepreneur at the end of the client/server wave and in the early phases of the Internet wave. Today, we are at the mass adoption phase of the social networking wave. I am obsessed with these technology waves and have spent a lot of time studying how they develop and what patterns can be observed."

Maples believes technology waves follow a three-phase pattern: "They start

with infrastructure. Advances in infrastructure are the preliminary forces that enable a large wave to gather. As the wave begins to gather, enabling technologies and platforms create the basis for new types of applications that cause a gathering wave to achieve massive penetration and customer adoption. Eventually, these waves crest and subside, making way for the next gathering wave to take shape."[9]

Entrepreneurs looking for windows of opportunity would be wise to consider Maples's metaphor.

> *Wherever new technologies suddenly make a behavior easier, new possibilities are*

born.

The creation of a new infrastructure often opens up unforeseen ways to make other actions simpler or more rewarding. For example, the Internet was first made possible because of the infrastructure commissioned by the U.S. government during the cold war. Next, enabling technologies such as dial-up modems, followed by high-speed Internet connections, provided access to the web. Finally, HTML, web browsers, and search engines—the application layer—made browsing possible on the World Wide Web. At each successive stage, previous enabling technologies allowed new behaviors and businesses

to flourish.

Identifying areas where a new technology makes cycling through the Hook Model faster, more frequent, or more rewarding provides fertile ground for developing new habit-forming products.

Interface Change

Technological changes often create opportunities to build new hooks. However, sometimes no technology change is required.

> *Many companies have found success in driving new habit*

formation by identifying how changing user interactions can create new routines.

Whenever a massive change occurs in the way people interact with technology, expect to find plenty of opportunities ripe for harvesting. Changes in interface suddenly make all sorts of behaviors easier. Subsequently, when the effort required to accomplish an action decreases, usage tends to explode.

A long history of technology businesses earned their fortunes discovering behavioral secrets made visible because of a change in the interface. Apple and Microsoft

succeeded by turning clunky terminals into graphical user interfaces (GUI) accessible by mainstream consumers. Google simplified the search interface as compared with those of ad-heavy, difficult-to-use competitors such as Yahoo! and Lycos. Facebook and Twitter turned new behavioral insights into interfaces that simplified social interactions online. In each case, a new interface made an action easier and uncovered surprising truths about user behaviors.

More recently, Instagram and Pinterest have capitalized on behavioral insights brought about by interface changes. Pinterest's ability to create a rich canvas of images—utilizing what

were then cutting-edge interface changes—revealed new insights about the addictive nature of an online catalog. For Instagram, the interface change was cameras integrated into smartphones. Instagram discovered that its low-tech filters made relatively poor-quality smartphone photos look great. Suddenly taking good pictures with your phone was easier; Instagram used its newly discovered insights to recruit an army of rabidly snapping users. With both Pinterest and Instagram, tiny teams generated huge value—not by cracking hard technical challenges, but by solving common interaction problems. Likewise, the fast ascent of mobile devices, including tablets, has spawned a new

revolution in interface changes—and a new generation of start-up products and services designed around mobile user needs and behaviors.

To uncover where interfaces are changing, Paul Buchheit, a partner at Y Combinator, encourages entrepreneurs to "live in the future."[10] A profusion of interface changes are just a few years away. Wearable technologies like Google Glass, the Oculus Rift virtual reality goggles, and the Pebble smartwatch promise to change how users interact with the real and digital worlds. By looking forward to anticipate where interfaces will change, the enterprising designer can uncover new ways to form user habits.

REMEMBER & SHARE

- The Hook Model helps the product designer generate an initial prototype for a habit-forming technology. It also helps uncover potential weaknesses in an existing product's habit-forming potential.
- Once a product is built, *Habit Testing* helps uncover product devotees, discover which product elements (if any) are habit forming, and why those aspects of

your product change user behavior. Habit Testing includes three steps: *identify*, *codify*, and *modify*.

- First, dig into the data to *identify* how people are using the product.
- Next, *codify* these findings in search of habitual users. To generate new hypotheses, study the actions and paths taken by devoted users.
- Finally, *modify* the product to influence more users to follow

the same path as your habitual users, and then evaluate results and continue to modify as needed.

- Keen observation of one's own behavior can lead to new insights and habit-forming product opportunities.
- Identifying areas where a new technology makes cycling through the Hook Model faster, more frequent, or more rewarding provides fertile ground for developing new habit-forming products.

- *Nascent behaviors*—new behaviors that few people see or do, yet ultimately fulfill a mass-market need—can inform future breakthrough habit-forming opportunities.

- New interfaces lead to transformative behavior change and business opportunities.

DO THIS NOW

Refer to the answers you came up with in the “Do This Now” section in chapter 5

to complete the following exercises:

- Perform Habit Testing, as described in this chapter, to identify the steps users take toward long-term engagement.
- Be aware of your behaviors and emotions for the next week as you use everyday products. Ask yourself:
  - What triggered me to use these products? Was I prompted externally or through internal means?
  - Am I using these

products as intended?

- How might these products improve their on-boarding funnels, reengage users through additional external triggers, or encourage users to invest in their services?

- Speak with three people outside your social circle to discover which apps occupy the first screen on their mobile devices. Ask them to use these apps as they normally would and see if you uncover any unnecessary or nascent behaviors.

- Brainstorm five new interfaces that could introduce opportunities or threats to your business.

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appendix

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Also, be sure to visit my blog, *Nir and Far* (NirAndFar .com), to learn more about habit-forming products and receive my latest essays.

Finally, please send questions, comments, edits, or feedback to: nir@nirandfar.com.

notes

Introduction

1. "IDC-Facebook Always Connected.pdf," File Shared from Box (accessed Dec. 19, 2013), https://fb-public.app.box.com/s/3iq5x6uwnqtq7ki4q8v

2. "Survey Finds One-Third of Americans More Willing to Give Up Sex Than Their Mobile Phones," TeleNav (accessed Dec. 19, 2013), http://www.telenav.com/about/pr-summer-travel/report-20110803.html.

3. Antti Oulasvirta, Tye Rattenbury, Lingyi

Ma, and Eeva Raita, "Habits Make Smartphone Use More Pervasive," *Personal and Ubiquitous Computing* 16, no. 1 (Jan. 2012): 105–14, doi:10.1007/s00779-011-0412-2.

4. Dusan Belic, "Tomi Ahonen: Average Users Looks at Their Phone 150 Times a Day!" *IntoMobile* (accessed Dec. 19, 2013), http://www.intomobile.com/2012/02/09/tor ahonen-average-users-looks-their-phone-150-times-day.

5. E. Morsella, J. A. Bargh, P. M. Gollwitzer, eds., *Oxford Handbook of Human Action* (New York: Oxford University Press, 2008).

6. For purposes of this book, I use the definition of *habit formation* as the process of learning new behaviors through repetition until they become automatic. I

am grateful to Dr. Stephen Wendel for pointing out the spectrum of habits. For a framework describing other automatic behaviors, see: John A. Bargh, "The Four Horsemen of Automaticity: Awareness, Intention, Efficiency, and Control in Social Cognition." *Handbook of Social Cognition*, vol. 1: *Basic Processes*; vol. 2: *Applications* (2nd ed.), eds. R. S. Wyer and T. K. Srull (Hillsdale, NJ: Lawrence Erlbaum Associates, Inc., 1994), 1–40.

7. Bas Verplanken and Wendy Wood, "Interventions to Break and Create Consumer Habits," *Journal of Public Policy & Marketing* 25, no. 1 (March 2006): 90–103, doi:10.1509/jppm.25.1.90.

8. W. Wood and D. T. Neal, "A New Look at Habits and the Habit-Goal Interface," *Psychological Review* 114, no. 4 (2007): 843–63.

9. “Pinterest,” Crunchbase, June 25, 2014. http://www.crunchbase.com/organization/pir

10. “What Causes Behavior Change?” B. J. Fogg’s Behavior Model (accessed Nov. 12, 2013), http://www.behaviormodel.org.

11. “Robert Sapolsky: Are Humans Just Another Primate?” FORA.tv (accessed Dec. 19, 2013), http://fora.tv/2011/02/15/Robert_Sapolsky_

12. Damien Brevers and Xavier Noël, “Pathological Gambling and the Loss of Willpower: A Neurocognitive Perspective,” *Socioaffective Neuroscience & Psychology* 3, no. 2 (Sept. 2013), doi:10.3402/snp.v3i0.21592.

13. Paul Graham, “The Acceleration of Addictiveness,” (accessed Nov. 12, 2013), http://www.paulgraham.com/addiction.html.

14. *Night of the Living Dead,* IMDb, (accessed June 25, 2014), http://www.imdb.com/title/tt0063350.

15. Richard H. Thaler, Cass R. Sunstein, and John P. Balz, "Choice Architecture" (SSRN Scholarly Paper, Rochester, NY), *Social Science Research Network* (April 2, 2010), http://papers.ssrn.com/abstract=1583509.

Chapter 1: The Habit Zone

1. Wendy Wood, Jeffrey M. Quinn, and Deborah A. Kashy, "Habits in Everyday Life: Thought, Emotion, and Action," *Journal of Personality and Social Psychology* 83, no. 6 (Dec. 2002): 1281–97.

2. Henry H. and Barbara J. Knowlton, "The Role of the Basal Ganglia in Habit Formation," *Nature Reviews Neuroscience*

7, no. 6 (June 2006): 464–76, doi:10.1038/nrn1919.

3. A. Dickinson and B. Balleine, "The Role of Learning in the Operation of Motivational Systems," in C. R. Gallistel (ed.), *Stevens' Handbook of Experimental Psychology: Learning, Motivation, and Emotion* (New York: Wiley and Sons, 2002), 497–534.

4. "Notes from 2005 Berkshire Hathaway Annual Meeting," Tilson Funds (accessed Nov. 12, 2013), http://www.tilsonfunds.com/brkmtg05notes.

5. "Charlie Munger: Turning $2 Million Into $2 Trillion," *Mungerisms* (accessed Nov. 12, 2013), http://mungerisms.blogspot.com/2010/04/cmunger-turning-2-million-into-2.html.

6. "Candy Crush: So Popular It's Killing King's IPO?" *Yahoo Finance* (accessed

Dec. 16, 2013), http://finance.yahoo.com/blogs/the-exchange/candy-crush-so-popular-it-s-smashing-interest-in-an-ipo-160523940.html.

7. Stephen Shankland, "Evernote: 'The Longer You Use It, the More Likely You Are to Pay,'" CNET (accessed Nov. 12, 2013), http://news.cnet.com/8301-30685_3-57339139-264/evernote-the-longer-you-use-it-the-more-likely-you-are-to-pay.

8. David H. Freedman, "Evernote: 2011 Company of the Year," *Inc.* (accessed Nov. 14, 2013), http://www.inc.com/magazine/201112/evern 2011-company-of-the-year.html.

9. David Skok, "Lessons Learned—Viral Marketing," *For Entrepreneurs* (accessed Nov. 12, 2013),

http://www.forentrepreneurs.com/lessons-learnt-viral-marketing.

10. John T. Gourville, "Eager Sellers and Stony Buyers: Understanding the Psychology of New-Product Adoption," *Harvard Business Review* (accessed Nov, 12, 2013), http://hbr.org/product/eager-sellers-and-stony-buyers-understanding-the-p/an/R0606F-PDF-ENG.

11. Cecil Adams, "Was the QWERTY Keyboard Purposely Designed to Slow Typists?," *Straight Dope* (Oct. 30, 1981), http://www.straightdope.com/columns/read/the-qwerty-keyboard-purposely-designed-to-slow-typists.

12. Mark E. Bouton, "Context and Behavioral Processes in Extinction," *Learning & Memory* 11, no. 5 (Sept. 2004): 485–94, doi:10.1101/lm.78804.

13. Ari P. Kirshenbaum, Darlene M. Olsen, and Warren K. Bickel, "A Quantitative Review of the Ubiquitous Relapse Curve," *Journal of Substance Abuse Treatment* 36, no. 1 (Jan. 2009): 8–17, doi:10.1016/j.jsat.2008.04.001.

14. Robert W. Jeffery, Leonard H. Epstein, G. Terrence Wilson, Adam Drewnowski, Albert J. Stunkard, and Rena R. Wing, "Long-term Maintenance of Weight Loss: Current Status," *Health Psychology* 19, no. 1, (2000): 5–16, doi:10.1037/0278-6133.19.Suppl1.5.

15. Charles Duhigg, *The Power of Habit: Why We Do What We Do in Life and Business* (New York: Random House, 2012), 20.

16. G. Judah, B. Gardner, and R. Aunger, "Forming a Flossing Habit: An Exploratory

Study of the Psychological Determinants of Habit Formation," *British Journal of Health Psychology* 18 (2013): 338–53.

17. Matt Wallaert, "Bing Your Brain: Test, Then Test Again," *Bing Blogs* (accessed Dec. 16, 2013), http://www.bing.com/blogs/site_blogs/b/sea your-brain-test-then-test-again.aspx.

18. "comScore Releases September 2013 U.S. Search Engine Rankings." comScore, Inc. (accessed Nov. 12, 2013), http://www.comscore.com/Insights/Press_R

19. Amazon Product Ads, Amazon.com (accessed Nov. 12, 2013), http://services.amazon.com/content/product ads-on-amazon.htm/ref=as_left_pads_apa1#!how-it-works.

20. Valerie Trifts and Gerald Häubl,

"Information Availability and Consumer Preference: Can Online Retailers Benefit from Providing Access to Competitor Price Information?," *Journal of Consumer Psychology* 2003, 149–59.

21. Nick Wingfield, "More Retailers at Risk of Amazon 'Showrooming,'" *Bits* blog (accessed Dec. 16, 2013), http://bits.blogs.nytimes.com/2013/02/27/n retailers-at-risk-of-amazon-showrooming/.

22. Brad Stone, *The Everything Store: Jeff Bezos and the Age of Amazon* (Boston: Little, Brown and Company, 2013).

23. Phillipa Lally, Cornelia H. M. van Jaarsveld, Henry W. W. Potts, and Jane Wardle, "How Are Habits Formed: Modelling Habit Formation in the Real World," *European Journal of Social Psychology* 40, no. 6 (2010): 998–1009,

doi:10.1002/ejsp.674.

24. Paul A. Offit, "Don't Take Your Vitamins," *New York Times* (June 8, 2013), http://www.nytimes.com/2013/06/09/opinic take-your-vitamins.html.

Chapter 2: Trigger

1. Accessed Nov. 12, 2013, http://instagram.com/press.

2. Somini Perlroth, Nicole Sengupta, and Jenna Wortham, "Instagram Founders Were Helped by Bay Area Connections," *New York Times* (April 13, 2012), http://www.nytimes.com/2012/04/14/techno founders-were-helped-by-bay-area-connections.html.

3. "Twitter 'Tried to Buy Instagram before Facebook.'" *Telegraph* (April 16, 2012),

http://www.telegraph.co.uk/technology/twitt
tried-to-buy-Instagram-before-
Facebook.html.

4. Barry Schwartz, *The Paradox of Choice* (New York: Ecco, 2004).

5. Blake Masters, "Peter Thiel's CS183: Startup—Class 2 Notes Essay," *Blake Masters* (April 6, 2012), http://blakemasters.com/post/20582845717
thiels-cs183-startup-class-2-notes-essay.

6. R. Kotikalapudi, S. Chellappan, F. Montgomery, D. Wunsch, and K. Lutzen, "Associating Internet Usage with Depressive Behavior Among College Students," *IEEE Technology and Society Magazine* 31, no. 4 (2012): 73–80, doi:10.1109/MTS.2012.2225462.

7. Sriram Chellappan and Raghavendra Kotikalapudi, "How Depressed People Use

the Internet," *New York Times* (June 15, 2012), http://www.nytimes.com/2012/06/17/opinic depressed-people-use-the-internet.html.

8. Ryan Tate, "Twitter Founder Reveals Secret Formula for Getting Rich Online," *Wired* (accessed Nov. 12, 2013), http://www.wired.com/business/2013/09/ev- williams-xoxo.

9. Erika Hall, "How the 'Failure' Culture of Startups Is Killing Innovation," *Wired* (accessed Nov. 12, 2013), http://www.wired.com/opinion/2013/09/why do-research-when-you-can-fail-fast-pivot- and-act-out-other-popular-startup-cliches.

10. "The Power of User Narratives: Jack Dorsey (Square)," video, Entrepreneurial Thought Leaders Lecture (Stanford University, 2011),

http://ecorner.stanford.edu/authorMaterialIn
mid=2644.

11. Eric Ries, "What Is Customer Development?," *Startup Lessons Learned* (accessed Nov. 12, 2013), http://www.startuplessonslearned.com/2008 is-customer-development.html.

12. Rich Crandall, "Empathy Map," the K12 Lab Wiki (accessed Nov. 12, 2013), https://dschool.stanford.edu/groups/k12/wik

13. Taiichi Ohno, *Toyota Production System: Beyond Large-scale Production* (Portland, OR: Productivity Press, 1988).

14. For more on the need for social belonging, see: Susan T. Fiske, *Social Beings: A Core Motives Approach to Social Psychology* (Hoboken: Wiley, 2010).

Chapter 3: Action

1. "What Causes Behavior Change?," B. J. Fogg's Behavior Model (accessed Nov. 12, 2013), http://behaviormodel.org.

2. Edward L. Deci and Richard M. Ryan, "Self-determination Theory: A Macrotheory of Human Motivation, Development, and Health," *Canadian Psychology/Psychologie Canadienne* 49, no. 3 (2008): 182–85, doi:10.1037/a0012801.

3. Barack Obama "*Hope*" poster, Wikipedia, the Free Encyclopedia, November 5, 2013, http://en.wikipedia.org/w/index.php?title=Barack_Obama_%22Hope%22_poste

4. Denis J. Hauptly, *Something Really New: Three Simple Steps to Creating Truly Innovative Products* (New York: AMACOM, 2007).

5. Ingrid Lunden, "Analyst: Twitter Passed 500M Users in June 2012, 140M of Them in US; Jakarta 'Biggest Tweeting' City," *TechCrunch* (accessed Nov. 12, 2013), http://techcrunch.com/2012/07/30/analyst-twitter-passed-500m-users-in-june-2012-140m-of-them-in-us-jakarta-biggest-tweeting-city.

6. "What Causes Behavior Change?," B. J. Fogg's Behavior Model (accessed Nov. 12, 2013), http://www.behaviormodel.org.

7. Leena Rao, "Twitter Seeing 90 Million Tweets Per Day, 25 Percent Contain Links," *TechCrunch* (accessed Nov. 12, 2013), http://techcrunch.com/2010/09/14/twitter-seeing-90-million-tweets-per-day.

8. Stephen Worchel, Jerry Lee, and Akanbi Adewole, "Effects of Supply and Demand on Ratings of Object Value," *Journal of*

Personality and Social Psychology 32, no. 5 (1975): 906–14, doi:10.1037/0022-3514.32.5.906.

9. Gene Weingarten, "Pearls Before Breakfast," *Washington Post* (April 8, 2007), http://www.washingtonpost.com/wp-dyn/content/article/2007/04/04/AR200704

10. Hilke Plassmann, John O'Doherty, Baba Shiv, and Antonio Rangel, "Marketing Actions Can Modulate Neural Representations of Experienced Pleasantness," *Proceedings of the National Academy of Sciences* 105, no. 3 (Jan. 2008): 1050–54, doi:10.1073/pnas.0706929105.

11. Joseph Nunes and Xavier Dreze, "The Endowed Progress Effect: How Artificial Advancement Increases Effort" (SSRN Scholarly Paper, Rochester, New York),

Social Science Research Network (accessed Nov. 12, 2013), http://papers.ssrn.com/abstract=991962.

12. "List of Cognitive Biases," Wikipedia, the Free Encyclopedia (accessed November 12, 2013), http://en.wikipedia.org/wiki/List_of_cogniti

13. Stephen P. Anderson, *Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences* (Berkeley: New Riders, 2011).

Chapter 4: Variable Reward

1. J. Olds and P. Milner, "Positive reinforcement produced by electrical stimulation of the septal area and other regions of rat brain," *Journal of Comparative and Physiological Psychology* 47 (1954), 419–27.

2. Brian Knutson, G. Elliott Wimmer, Camelia M. Kuhnen, and Piotr Winkielman, "Nucleus Accumbens Activation Mediates the Influence of Reward Cues on Financial Risk Taking," *Neuroreport* 19, no. 5 (March 2008): 509–13, doi:10.1097/WNR.0b013e3282f85c01.

3. V. S. Ramachandran, *A Brief Tour of Human Consciousness: From Impostor Poodles to Purple Numbers* (New York: Pi Press, 2004).

4. Mathias Pessiglione, Ben Seymour, Guillaume Flandin, Raymond J. Dolan, and Chris D. Frith, "Dopamine-Dependent Prediction Errors Underpin Reward-Seeking Behaviour in Humans," *Nature* 442, no. 7106 (Aug. 2006): 1042–45, doi:10.1038/nature05051.

5. Charles B. Ferster and B. F. Skinner,

Schedules of Reinforcement (New York: Appleton-Century-Crofts, 1957).

6. G. S. Berns, S. M. McClure, G. Pagnoni, and P. R. Montague, "Predictability Modulates Human Brain Response to Reward," *Journal of Neuroscience* 21, no. 8 (April 2001): 2793–98.

7. L. Aharon, N. Etcoff, D. Ariely, C. F. Habris, et al., "Beautiful Faces Have Variable Reward Value: fMRI and Behavioral Evidence," *Neuron* 32, no. 3 (Nov. 2001): 537–551.

8. A. Bandura, *Social Foundations of Thought and Action: A Social Cognitive Theory* (Englewood Cliffs, NJ: Prentice Hall, 1986).

9. A. Bandura, *Self-Efficacy: The Exercise of Self-Control* (New York: W. H. Freeman, 1997).

10. "Why Humanizing Players and Developers Is Crucial for *League of Legends*" (accessed Nov. 12, 2013), http://www.gamasutra.com/view/news/3684

11. Christian Nutt, "*League of Legends*: Changing Bad Player Behavior with Neuroscience," Gamasutra (accessed Nov. 12, 2013), http://www.gamasutra.com/view/news/1786

12. Katharine Milton, "A Hypothesis to Explain the Role of Meat-Eating in Human Evolution," *Evolutionary Anthropology: Issues, News, and Reviews* 8, no. 1 (1999): 11–21, doi:10.1002/(SICI)1520-6505(1999)8:1<11::AID-EVAN6>3.0.CO;2-M.

13. Alok Jha, "Stone Me! Spears Show Early Human Species Was Sharper Than We Thought," *Guardian* (Nov. 15, 2012),

http://www.theguardian.com/science/2012/n
spear-early-human-species.

14. Robin McKie, "Humans Hunted for Meat 2 Million Years Ago," *Guardian* (Sept. 22, 2012), http://www.theguardian.com/science/2012/s hunting-evolution-2million-years.

15. Daniel Lieberman, "The Barefoot Professor: By Nature Video" (2010), http://www.youtube.com/watch?v=7jrnj-7YKZE.

16. Gary Rivlin, "Slot Machines for the Young and Active," *New York Times* (Dec. 10, 2007), http://www.nytimes.com/2007/12/10/busine

17. Kara Swisher and Liz Gannes, "Pinterest Does Another Massive Funding—$225 Million at $3.8 Billion Valuation (Confirmed)," *All Things Digital* (accessed

Nov. 12, 2013), http://allthingsd.com/20131023/pinterest-does-another-massive-funding-225-million-at-3-8-billion-valuation.

18. B. Zeigarnik, "Uber das Behalten yon erledigten und underledigten Handlungen." *Psychologische Forschung* 9 (1927): 1–85.

19. Edward L. Deci and Richard M. Ryan, "Self-determination Theory: A Macrotheory of Human Motivation, Development, and Health," *Canadian Psychology/Psychologie Canadienne* 49, no. 3 (2008): 182–85, doi:10.1037/a0012801.

20. Alexia Tsotsis and Leena Rao, "Mailbox Cost Dropbox Around $100 Million," *TechCrunch* (accessed Nov. 29, 2013), http://techcrunch.com/2013/03/15/mailbox-

cost-dropbox-around-100-million.

21. Quantcast audience profile for mahalo.com (according to Jason Calcanis), Quantcast.com (accessed June 19, 2010), https://www.quantcast.com/mahalo.com.

22. Graham Cluley, "Creepy Quora Erodes Users' Privacy, Reveals What You Have Read," *Naked Security* (accessed Dec. 1, 2013), http://nakedsecurity.sophos.com/2012/08/0 quora-erodes-users-privacy-reveals-what-you-have-read.

23. Sandra Liu Huang, "Removing Feed Stories About Views," Quora (accessed Nov. 12, 2013), http://www.quora.com/permalink/gG922byw

24. Christopher J. Carpenter, "A Meta-analysis of the Effectiveness of the 'But You Are Free' Compliance-Gaining

Technique," *Communication Studies* 64, no. 1 (2013): 6–17, doi:10.1080/10510974.2012.727941.

25. Juho Hamari, "Social Aspects Play an Important Role in Gamification," *Gamification Research Network* (accessed Nov. 13, 2013), http://gamification-research.org/2013/07/social-aspects.

26. Josef Adalian, "*Breaking Bad* Returns to Its Biggest Ratings Ever," *Vulture* (accessed Nov. 13, 2013), http://www.vulture.com/2013/08/breaking-bad-returns-to-its-biggest-ratings-ever.html.

27. Mike Janela, "Breaking Bad Cooks up Record-breaking Formula for *Guinness World Records 2014* Edition," *Guinness World Records* (accessed Nov. 13, 2013), http://www.guinnessworldrecords.com/news

bad-cooks-up-record-breaking-formula-for-guinness-world-records-2014-edition-51000.

28. Geoff F. Kaufman and Lisa K. Libby, "Changing Beliefs and Behavior through Experience-Taking," *Journal of Personality and Social Psychology* 103, no. 1 (July 2012): 1–19, doi:10.1037/a0027525.

29. C. J. Arlotta, "*CityVille* Tops *FarmVille*'s Highest Peak of Monthly Users," *SocialTimes* (accessed Nov. 13, 2013), http://socialtimes.com/cityville-tops-farmvilles-highest-peak-of-monthly-users_b33272.

30. Zynga, Inc., Form 10-K Annual Report, 2011 (San Francisco: filed Feb. 28, 2012), http://investor.zynga.com/secfiling.cfm?filingID=1193125-12-

85761&CIK=1439404.

31. Luke Karmali, "*Mists of Pandaria* Pushes *Warcraft* Subs over 10 Million," *IGN* (Oct. 4, 2012), http://www.ign.com/articles/2012/10/04/mi of-pandaria-pushes-warcraft-subs-over-10-million.

Chapter 5: Investment

1. "Taiwan Teen Dies After Gaming for 40 Hours," The *Australian* (accessed Nov. 13, 2013), http://www.theaustralian.com.au/news/latest- news/taiwan-teen-dies-after-gaming-for-40-hours/story-fn3dxix6-1226428437223.

2. James Gregory Lord, *The Raising of Money: 35 Essentials Trustees Are Using to Make a Difference* (Seattle: New Futures Press, 2010).

3. Robert B. Cialdini, *Influence: The Psychology of Persuasion* (New York: HarperCollins, 2007).

4. Michael I. Norton, Daniel Mochon, and Dan Ariely, *The "IKEA Effect": When Labor Leads to Love* (SSRN Scholarly Paper, Rochester, NY), *Social Science Research Network*. (March 4, 2011), http://papers.ssrn.com/abstract=1777100.

5. J. L. Freedman and S. C. Fraser, "Compliance Without Pressure: The Foot-in-the-Door Technique," *Journal of Personality and Social Psychology* 4, no. 2 (1966): 196–202.

6. "Jesse Schell @ DICE2010 (Part 2)," (2010), http://www.youtube.com/watch?v=pPfaSxU6jyY.

7. B. J. Fogg and C. Nass, "How Users Reciprocate to Computers: An Experiment

That Demonstrates Behavior Change," in *Proceedings of CHI* (ACM Press, 1997), 331–32.

8. Jonathan Libov, "On Bloomberg: 'You could code Twitter in a day. Then you'd just need to build the network and infrastructure.' Didn't know it was so easy!," Twitter, @libovness (Nov. 7, 2013), https://twitter.com/libovness/status/398451

9. Andrew Min, "First Impressions Matter! 2690 of Apps Downloaded in 2010 were used Just Once," *Localytics* (accessed July 23, 2014), http://www.localytics.com/blog/2011/first-impressions-matter-26-percent-of-apps-downloaded-used-just-once.

10. Peter Farago, "App Engagement: The Matrix Reloaded," *Flurry* (accessed Nov. 13, 2013),

http://blog.flurry.com/bid/90743/App-Engagement-The-Matrix-Reloaded.

11. Anthony Ha, "Tinder's Sean Rad Hints at a Future Beyond Dating, Says the App Sees 350M Swipes a Day," *TechCrunch* (accessed Nov. 13, 2013), http://techcrunch.com/2013/10/29/sean-rad-disrupt.

12. Stuart Dredge, "Snapchat: Self-destructing Messaging App Raises $60M in Funding," *Guardian* (June 25, 2013), http://www.theguardian.com/technology/app app-self-destructing-messaging.

13. Kara Swisher and Liz Gannes, "Pinterest Does Another Massive Funding—$225 Million at $3.8 Billion Valuation (Confirmed)," *All Things Digital* (accessed Nov. 13, 2013), http://allthingsd.com/20131023/pinterest-

does-another-massive-funding-225-million-at-3-8-billion-valuation/.

Chapter 6: What Are You Going to Do with This?

1. For further thoughts on the morality of designing behavior, see: Richard H. Thaler, Cass R. Sunstein, and John P. Balz, "Choice Architecture" (SSRN Scholarly Paper, Rochester, New York), *Social Science Research Network*, (April 2, 2010), http://papers.ssrn.com/abstract=1583509.

2. Charlie White, "Survey: Cellphones vs. Sex—Which Wins?," *Mashable* (accessed), http://mashable.com/2011/08/03/telenav-cellphone-infographic.

3. Ian Bogost, "The Cigarette of This Century," *Atlantic* (June 6, 2012), http://www.theatlantic.com/technology/arch

cigarette-of-this-century/258092/.

4. David H. Freedman, "The Perfected Self," *Atlantic* (June 2012), http://www.theatlantic.com/magazine/archive/2012/06/the-perfected-self/308970/.

5. Paul Graham,"The Acceleration of Addictiveness," *Paul Graham* (July 2010; accessed Nov. 12, 2013), http://www.paulgraham.com/addiction.html.

6. Gary Bunker, "The Ethical Line in User Experience Research," *mUmBRELLA* (accessed Nov. 13, 2013), http://mumbrella.com.au/the-ethical-line-in-user-experience-research-163114.

7. Chris Nodder, "How Deceptive Is Your Persuasive Design?" *UX Magazine* (accessed Nov. 13, 2013), https://uxmag.com/articles/how-deceptive-is-your-persuasive-design.

8. "Nurturing Self-help Among Kenyan Farmers," *GSB in Brief* (accessed Dec. 1, 2013), http://www.gsb.stanford.edu/news/bmag/sbsı kenyan.html.

9. David Stewart, *Demystifying Slot Machines and Their Impact in the United States,* American Gaming Association (May 26, 2010), http://www.americangaming.org/sites/defaul

10. Michael Shermer, "How We Opt Out of Overoptimism: Our Habit of Ignoring What Is Real Is a Double-Edged Sword," *Scientific American* (accessed Nov. 13, 2013), http://www.scientificamerican.com/article.c id=opting-out-of-overoptimism.

11. Jason Tanz, "The Curse of Cow Clicker: How a Cheeky Satire Became a Videogame

Hit," *Wired* (accessed Nov. 13, 2013), http://www.wired.com/magazine/2011/12/ff

12. Ian Bogost, "Cowpocalypse Now: The Cows Have Been Raptured," Bogost.com (accessed Nov. 13, 2013), http://www.bogost.com/blog/cowpocalypse_

Chapter 7: Case Study: The Bible App

1. "On Fifth Anniversary of Apple iTunes Store, YouVersion Bible App Reaches 100 Million Downloads: First-Ever Survey Shows How App Is Truly Changing Bible Engagement," *PRWeb* (July 8, 2013), http://www.prweb.com/releases/2013/7/prw

2. Alexia Tsotsis, "Snapchat Snaps Up a $80M Series B Led by IVP at an $800M Valuation," *TechCrunch* (accessed Nov. 13, 2013), http://techcrunch.com/2013/06/22/source-

snapchat-snaps-up-80m-from-ivp-at-a-800m-valuation.

3. YouVersion infographics (accessed Nov. 13, 2013), http://blog.youversion.com/wp-content/uploads/2013/07/themobilebible1.j

4. Henry Alford, "If I Do Humblebrag So Myself," *New York Times* (Nov. 30, 2012), http://www.nytimes.com/2012/12/02/fashio humblebrag-the-unfortunate-rise-of-false-humility.html.

5. Diana I. Tamir and Jason P. Mitchell, "Disclosing Information About the Self Is Intrinsically Rewarding," *Proceedings of the National Academy of Sciences* (May 7, 2012): 201202129, doi:10.1073/pnas.1202129109.

Chapter 8: Habit Testing and Where to Look for Habit-Forming Opportunities

1. Mattan Griffel, "Discovering Your Aha! Moment," *GrowHack* (Dec. 4, 2012), http://www.growhack.com/2012/12/04/disc your-aha-moment.

2. Paul Graham, "Schlep Blindness," *Paul Graham* (Jan. 2012), http://paulgraham.com/schlep.html.

3. Joel Gascoigne, "Buffer October Update: $2,388,000 Annual Revenue Run Rate, 1,123,000 Users," Buffer (Nov. 7, 2013), http://open.bufferapp.com/buffer-october-update-2388000-run-rate-1123000-users.

4. Tessa Miller, "I'm Joel Gascoigne, and This Is the Story Behind Buffer," *Life Hacker* (accessed Nov. 13, 2013), http://www.lifehacker.co.in/technology/Im-Joel-Gascoigne-and-This-Is-the-Story-Behind-Buffer.

5. Nancy Martha West, *Kodak and the Lens*

of Nostalgia (Charlottesville: The University Press of Virginia, 2000).

6. G. Cosier and P. M. Hughes, "The Problem with Disruption," *BT Technology* 19, no. 4 (Oct. 2001): 9.

7. Clifford A. Pickover, *Time: A Traveler's Guide* (New York: Oxford University Press, 1998).

8. Clifford Stoll, "The Internet? Bah!" *Newsweek* (Feb. 27, 1995), http://www.english.illinois.edu/-people-/faculty/debaron/582/582%20readings/stoll

9. Mike Maples Jr., "Technology Waves and the Hypernet," *Roger and Mike's Hypernet Blog* (accessed Nov. 13, 2013), http://rogerandmike.com/post/1462905801 waves-and-the-hypernet.

10. Paul Graham, "How to Get Startup Ideas."

Paul Graham (Nov. 2012), http://paulgraham.com/startupideas.html.