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THE NEW DOPE

Take control of your digital footprint
and avoid toxic behaviours

The New Dope

english version

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MOTIVATIONS BEHIND THIS BOOK

Through this book I intend to share the story of the Internet. I have spent the last 15 years creating websites and I have been fascinated by the Web for as long as I can remember. The Internet is the result of the collective work of thousands of anonymous developers. Did you know that? People you have never heard of. Passionate minds believing in utopia: to make content accessible to anyone, anytime, from anywhere.

With great power comes great responsibility. But, truth be told, with great power also come big corporations. The Internet has been captured and locked down. And this, my friend, is forever done. It's time to understand how the Internet works. What are its core components and why is everything you are using free? Free things often come at a price. We simply don't see it yet but we have accepted a loan without giving it too much thought. We unconsciously surrender to every notification and binge on dopamine shots. We think we are living a joyful fantasy, when in reality we don't even realise how much technology has changed us and how much the Internet is *still* shaping our human spirit.

We can no longer avoid the question: is the Web dangerous? What are the risks? What can I do to take control? What do *they* know about me? This book is an attempt to clear things out. It's also a response to people I love who are desperately asking for help. Family, friends, coworkers: all of them are asking me profound questions about technology. There is a new kind of war looming on the horizon. The type of war you can't touch but you can already feel in the air. I truly believe

we will survive this war as long as we fight it with knowledge and common sense. With conscious choices and humility.

I am fed up with sensational books that paint a dark vision of the future since they don't provide any real solutions and prefer blaming others to educating readers. This book *is* about consumer education. I encourage you to take the time to let the ideas in each chapter sink in. The ideas that you will find in this book build upon one another. You might get lost if you go too fast , so don't be shy to dive in and out of it as you move along in your own journey.

PART I

Chapter 1: How the Internet works

We will go over the technical side of the Internet. We will focus on things you are using on a daily basis like WiFi, browsers, Websites, and social apps. We will also bring some light to what cookies, servers, clients, requests, responses, machine learning and other everyday technologies *really* are.

Chapter 2: How to manage your digital footprint

The whole point of this chapter is to explore some practical ways to use the Web more safely. You will learn some Internet browsing tips that you will be able to apply on both your desktop and phone (whether iOS or Android) as well as some security concepts to help you make a conscious use of the Internet.

PART II

Chapter 1: How does your brain work

After figuring out the technical side of the Internet, it's vital to connect this knowledge with the brain. In order to do this, we also have to understand some key aspects of our brain. What are the components of our metabolism? What can make us react in a certain way? How does this process happen?

Chapter 2: How to change your behaviours

Finally, this book will take you through what can you do everyday to adapt your behaviour and take control of your life once you have decided how you want to live it. You will observe and learn from your own behaviours and understand their impact on the world. Technology has changed us. We need to choose what what we want to accept and what we do not.

PART I

CHAPTER 1

HOW THE INTERNET WORKS

A brief history of the Internet

In 1965, two computers were connected to one another for the first time. Three years later, the ARPANET project was born in an effort to connect various computers together, mostly across US university campuses. The term *Internet* is a commercial version of ARPANET and first appeared in 1973 to extend access to the ARPANET network to other people, not just universities. The core technology behind the Internet, **TCP/IP (Transmission Control Protocol/Internet Protocol)**, was standardised and started being used widely in 1982. It's the foundation of the Internet as we know it today.

Imagine TCP/IP as a shipping company (think DHL, UPS, or similar). You can use these services to move whatever you want, whenever you want, as far as you want. You only need to know the sender's address and the shipping address. The service operator doesn't know what's inside the parcel. They just know where to send it, how to track it, and it also makes sure the parcel arrives, sending a confirmation of receipt after the shipment is finalised. This is basically how TCP/IP works. It's cheap because the parcels are sent through cables. And it's very flexible because you can send any kind of parcel you want.

On top of TCP/IP, you can build anything you want. This is how emails, websites, WhatsApp messages, Facebook Ads, Netflix movies are delivered to your door.

In 1991, Tim Bernes-Lee created the HTTP protocol on top on TCP/IP to deliver Web pages (websites). HTTP may be just another proto-

col, like SMTP and IMAP for emails but it really marked a turning point in the history of the Internet. HTTP gave way to what is known today as the World Wide Web (WWW). Bernes-Lee also invented a key concept: **hypertext links**. In short, the ability to navigate to various pages from a single page. Hypertext links help link all pages together. Like a tree of knowledge, a giant encyclopaedia. An open place for anyone willing to share content openly, deliberately, and without any concept of protection.

The Web was designed as an Information System, not as a Telecommunications System. (Dan Geer)

The Web has evolved technologically since 1991, but if we look at the foundations, not that much. Networks have become faster, computers more powerful, and the ways in which the Internet is used have changed. But the system is still standing on the pillars built in the context of 1991, not 2019.

The other major step in the history of the Internet are smartphones. More specifically, the first iPhone, which was introduced by Apple in June of 2007. It was a revolution on many levels. PDAs and other devices had been on the market for quite some time but the user experience didn’t match the consumer market. It was a complex corporate device. The iPhone changed the game entirely by providing a simple way to access the Internet straight from people's pockets. This revolution happened at about the same time Facebook was starting. Be-

tween 2008 and 2012, we saw the emergence and explosion of social apps.

By 2012, social networking apps had already become a standard in the consumer market. They offered a new way to share, to express ourselves, to buy, and, above everything, the best platform to sell products. Keep in mind we live in a capitalist world governed by the consumer market. We need to name things as they are. Because we can't understand the state of the Internet without understanding the context that has shaped it.

Where are we now? The Internet is a giant network used for a wide range of activities. E-Commerce sites (e.g. Amazon, Alibaba) and social apps (e.g. Facebook, Instagram, Twitter, YouTube) are visibly dominating the ecosystem. Then come personal communication apps (e.g. WhatsApp, Messenger, Telegram). And after these, there comes a list of countless services running on the Internet that operate in any industry imaginable: banks, universities, hospitals, hotels, law enforcement, you name it. Virtually everything, even your fridge, is now using the Internet as a transport and storage mechanism. The adoption rate of the Internet worldwide is unmatched to this day. And yet, no one is educating us about it. It's a drug we don't know how to metabolise.

Client and Server

Imagine you want to share a book with your friends. One way of doing it is to print and send a copy to all of them. It's expensive, time-consuming, and if your friends liked it, they would be unlikely to pass it on because that'd cost them money too!

One way to solve the problem is to have a single copy of the book stored in a library and tell your friends where this library is. That way

you only have to print one copy of the book, you don't have to send it out and if you want to change the content of the book, you can, because you only have one copy to edit. In our metaphor, your friends have to spend money and time to come to the library, but imagine the cost is free and the commute time is 5 seconds. It's some sort of teleportation. Trust me, they will come! If people like it they can tell their friends to go to this library too.

Consider an Internet **server** as a library: a central location where information is stored. Except this library is accessible at no cost, you just need an Internet connexion. There are some challenges, though: if you want to maximise the amount of people who can read it, the library should be open 24/7. So a server must be operating 24/7, which is the first difference with a **client**. A client is like a library visitor, someone who stops by only for a short moment.

Now let's call this library **www.the-new-dope.com**, and *bam!* This is the address of a server and you can read the content and share it. You can visit it from everywhere, anytime. There is a second important characteristic about servers: they have a unique address. A library can accommodate many books but there is an index of where any book is located inside the library. For example, this particular book might be in the New York Public Library, floor 3, area 12, row 5. We could translate this address into a URL, something you are familiar with: **www.new-york-public-library.com/floor-3/area-12/row-5**. [*This is obviously a fake address to illustrate the example*]

My example is what we call a read-only scenario, meaning you can just read my content but not edit it. If you want to write your own book, you need to create a server and an address, upload the content, share it, etc., which is a painful and technical process. That's what led to the advent of the *Web 2.0*, where platforms like MySpace, Facebook, and Twitter sprang up, somewhere between 2005-2010. These websites

allow people to create content easily from their computer's browser (more on this topic later) or from their phones, and share it. No technical skills required. These plate-forms are servers that help you store content in different ways: text, images, videos, audio, etc. They make the technical complexity invisible to the user's eyes. And this is why we don't know how things work. We just click on shinny buttons without looking at what's behind them.

At this point you should totally master the concept of server. A central repository that stores content. As you might imagine, all servers are different. Twitter is not Facebook, YouTube is not Instagram, and so on. They do different things but they are all based on the same foundations: you send content to a server and the server dispatches the information when someone needs it.

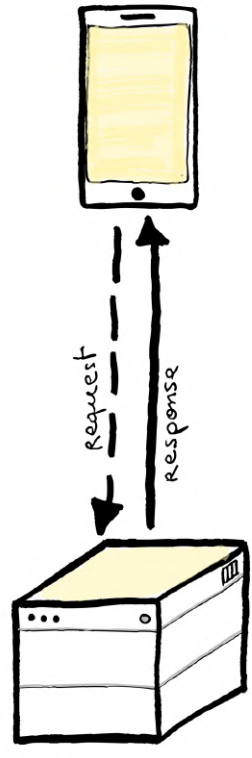
Let's expand the concept of clients and servers a little bit more to include mobile applications. An application is just a client connected to a server. For example, when you use your Web browser to visit www.facebook.com, or when you use your phone, more specifically, the Facebook application, you can indeed access and share the **same content**. Why? Because this content is still on Facebook servers. You are just using two different clients to access it.

You should understand by now that all mobile applications are just clients helping you access content on a server. One question could arise: Why do we need mobile applications? Why don't we use the mobile Web browser (e.g. Safari, Chrome, Opera) to access www.facebook.com?

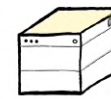
It's a very valid question. The reason we saw the explosion of mobile applications is a technical one: the mobile web browser is slower than **native applications** (the ones you install from the App Store, Google Play Store, etc). In addition, the mobile Web browser can't access your camera, pictures, geolocation, microphone, storage, etc. However, this

is changing because mobile Web browsers are starting to open functionalities. We still rely on native applications as clients on our phones. And this is probably going to stay like this for a long time (we will talk about it later).

The client asks for something and the server delivers it. Easy.



client (phone)



server

The Internet Network

The communication between the client and the server is a concept similar to a carrier company, as we said: a client asks for something and the server delivers it. The client sends a request to a specific server and the server responds with content.

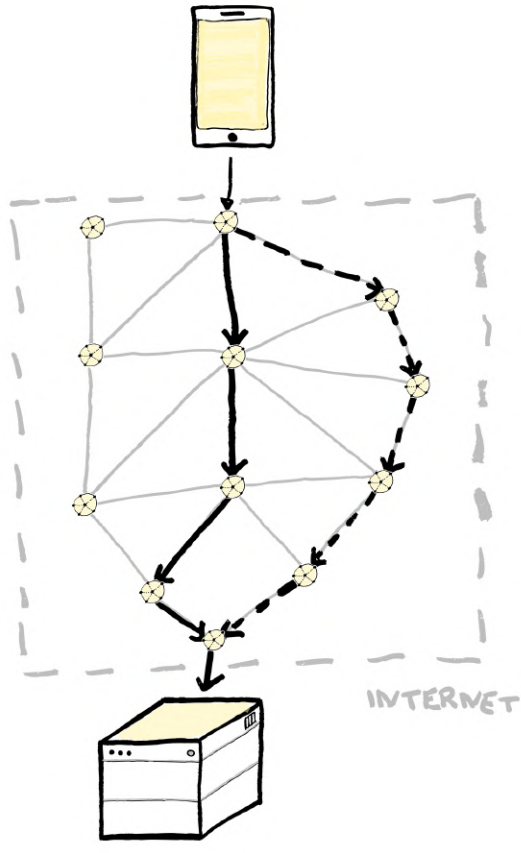
TCP/IP is the protocol responsible for **routing** the request and response. Internet routing works like traffic. Imagine you are in Paris and want to go to Madrid by car. Planning this trip on Google Maps will offer you different routes. But let's say you choose the fastest one following this path: *Paris* > *Orléans* > *Poitiers* > *Bordeaux* > *Bayonne* > *Burgos* > *Madrid*. These are some of the biggest cities you will drive through, which are, in turn, connected to other cities through different highways. Therefore, from Bordeaux I can also go to Toulouse, and so on. Each city is considered a **switch** (or router).

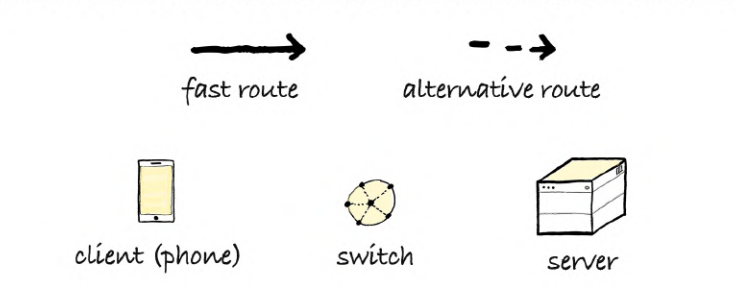
Just as big cities connect other cities, **Internet switches connect servers and clients**. It's a giant mesh. Your Web request may look like this: *Phone (client)* > *WiFi* > *Internet provider* > *switch 1* > *switch 2* > *switch 3* > *switch 4* > *Destination (server)*. Your Internet provider will decide which switch is the closest to your destination (switch 1); switch 1 will then decide which switch is the next closest, in our case switch 2; and so it goes until we reach the destination. It's important to note that the route chosen may be different depending on the traffic. If there is too much traffic on the main road and cars are going slow, it might be faster to take a longer path at a normal speed. Internet routing uses a traffic control system to ensure packets use the fastest route to reach the destination. But this happens only among switches. The key factor is to reach the first switch. This is why your connection is sometimes slow. The first switch will forward the packet to the following

switches. Since all switches are connected through optical fibre, they won't slow down your Internet connection. The bottleneck is in your WiFi and your Internet provider.

See these fantastic maps if you want to gain a better understanding of the Internet global network: https://the-new-war.com/link/internet

A visual summary of the Internet Network is shown in the figure below. The solid black lines represent the fastest route between the Client and the Server. The dashed black lines depict an alternative route in case the main one is too busy:


INTERNET


fast route
alternative route
client (phone)
switch
server

The Web Browser

Now you know that the Web browser (let's call it browser) is just a client. Internet browsing all starts with an address, which we call URL. Here are some examples of URLs: www.google.com, www.facebook.com, www.instagram.com. Let's go step by step and see what happens in your browser when you type an address. We need to go back to the TCP/IP (Transmission Control Protocol/Internet Protocol) mechanism and expand on it a little bit more. Remember I said HTTP was a protocol built on top of TCP/IP? Now we have to understand what TCP/IP and HTTP are.

An URL is converted into an **IP address** as it is typed on the browser because TCP/IP only understands IP (numbers). This step is called DNS (Domain Name Server) resolution. It converts www.facebook.com into **`31.13.83.36`**. This address might be a different one and it can change. However, the domain name (www.facebook.com) always stays the same. Imagine the mess otherwise! The DNS resolution is done by a specific kind of server called DNS server. This is pure TCP/IP, not HTTP.

When the browser knows the IP address (in our example **`31.13.83.36`**) it will send an **HTTP request** to the server asking for content. The request will pass through various switches until it arrives at the destination. The server will then **respond** with content, which will be an HTML page. Be careful here, not HTTP, but **HTML**. HTML (*Hyper Text Markup Language*) is something that looks like code but it's not exactly a programming language. We call it markup language. It helps to structure the content and looks like this:

```
<!doctype html>
<html>
 <head>
  <title>Awesome HTML page</title>
  <meta name="description" content="This is an HTML
  page">
  <link rel="stylesheet" href="css/style.css">
  <script src="js/animations.js"></script>
 </head>
 <body>
  <nav>
   <h1>Hello my friend</h1>
   <img src="images/homepage.png">
   <p>
   This paragraph is an <strong>example</strong> of
   content you can write.
   </p>
  </nav>
 </body>
</html>
```

It includes links to other resources like images, CSS, and JavaScript. So, when your browser reads the HTML code, it will understand and load this page any other resources linked to it. The goal of this book is not to explain all the technical details of the different types of resources. But there is a fast way of describing them:

- **Images**: All the pictures you see on the page.
- **CSS**: The styling of a Web page is done with CSS (e.g. background colours, text colours, text font, text size, positioning of the navigation…). Every visual element of the website is styled using CSS.

- **JavaScript**: It creates all interactions inside the page: effects, transitions, anything that is dynamic.

This is a short example of CSS:

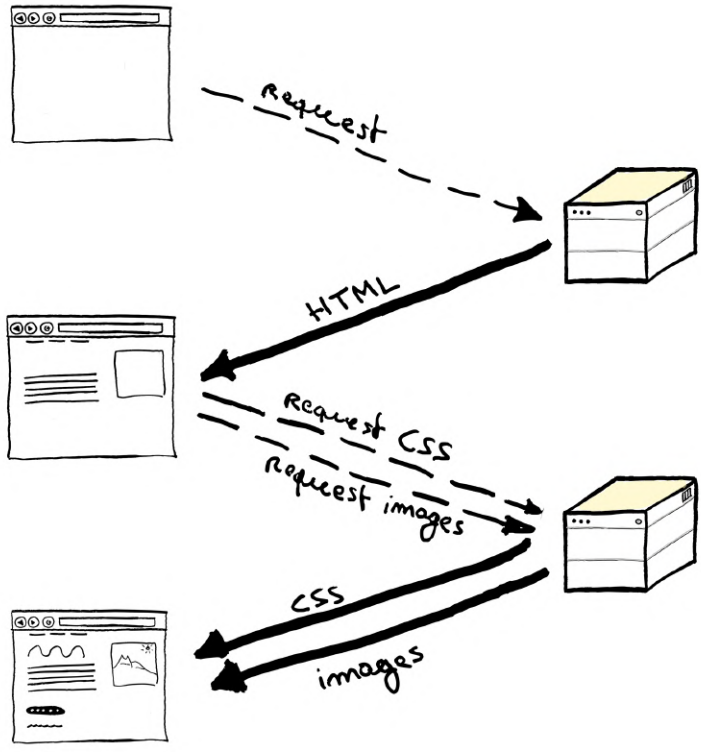
```
.container {
    width: 80%;
    margin: 0 auto;
    background: white;
}
```

Here’s a short example of JavaScript:

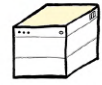
```
document.getElementById('btn').addEventListener('click',function(e){
 document.getElementById('box').style.display = 'none';
});
```

In the end, the browser will combine all these resources together to make the page pretty and usable. You might have many questions about how it works, but I guarantee you it's not much more than taking content and rendering it in the best possible way.

Like a printer rendering a PDF to paper, the browser renders a HTML page to make it visual and usable by humans.



browser



server

Native Mobile Applications

Surprise! Now you know a native mobile application is also a client. The difference is it's a client for a **specific server**. That's why you have one application per service (Facebook, Twitter, Instagram, WhatsApp, etc).

Why do we need native apps? Because phone hardware is slower than computer hardware. We need to optimise the use of the screen, the navigation and the global user experience. A native mobile application allows full control of that. As I mentioned earlier, applications can access things like pictures, videos, camera, microphone, contacts, geolocation, storage –just to name a few– on your phone. This is a crucial point. When you allow an application to access something, it has access to it anytime, even when you are not using the app.

Here’s another important fact: when you uninstall an application, you also cut access to all the things it had access to before. And as you may have experienced, you don't forever erase your account when you uninstall an application. You just "log out". All your data is still on the server. The application is just a client. The data stays on the server because it's the central location for data storage. If the data was on the phone, you couldn't synchronise your phone with your laptop, for example. Or you would have multiple copies of the same files, or duplicates in your contacts, etc. At some point, data needs to be centralised. Servers are outside of your control. But you can control which application sends *what* and *when.* We will cover precisely this in the next chapter.

Cookies

"This Website uses cookies ... Do you accept them?"

Does this sound familiar to you? All Websites ask this question nowadays because it's technically illegal to use cookies without asking the visitor for permission (in Europe at least). But everyone clicks on "yes" without any idea of what that implies.

Before starting our journey into the heart of cookies, we have to note that native mobile applications **don't ask for cookie permission**. Because they use another internal system to simulate the behaviour of cookies. Mobile apps store data in a dedicated folder so each app is isolated from the others (for security reasons). They are like cookies but on your phone. On the other hand, cookies are part of the HTTP protocol and they are only used in a Web browser (desktop or mobile).

We need to get back to the functioning of a browser: the browser makes a **request** to a server, and the server **responds** with content. After you make a request, the browser sends a bunch of information to the server. Even if the server doesn't ask for that information, it's part of the HTTP protocol. It's just how things work.

This is what a full and valid HTTP request looks like the first time you visit a website:

```
  AUTHORITY: www.new-york-public-library.com
  METHOD: GET
  PATH: /floor-3/area-12/row-5
  SCHEME: https
  ACCEPT:      text/html,application/xhtml+xml,application/
xml;q=0.9,image/Webp,image/apng,*/*;q=0.8,application/
signed-exchange;v=b2
  ACCEPT-ENCODING: gzip, deflate, br
  ACCEPT-LANGUAGE:                                    en-GB,en-
US;q=0.9,en;q=0.8,fr;q=0.7,es;q=0.6
  CACHE-CONTROL: no-cache
  USER-AGENT: Mozilla/5.0 (Macintosh; Intel Mac OS X
10_14_2) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/
71.0.3578.98 Safari/537.36
```

Let's translate it into a more human readable way:

"Hi server www.new-york-public-library.com (**AUTHORITY**)

I want to GET some content (**METHOD**)

Located in /floor-3/area-12/row-5 (**PATH**)

Because I care about my security, please use HTTPS (**SCHEME**)

I will be happy to render HTML content; if you can't, I can also understand XML (**ACCEPT**)

Oh, I can read compressed content. Actually, it will be faster for you to send it compressed. (**ACCEPT-ENCODING**)

I'm more comfortable with content being displayed in English from the UK (en-GB), but I can also speak French or Spanish if you don't have anything in English. (**ACCEPT-LANGUAGE**)

I don't want an old version of the content, I want the latest one (**CACHE-CONTROL**)

I forgot to mention, I'm Chrome version 71, running on Mac OS X version 10.14.1 and using AppleWebkit rendering engine, version 537.36 (**USER-AGENT**)

By the way, it's the first time I visit you. (**because no cookies were sent**)"

I hope this is becoming clearer for you. Every HTTP request also sends a bunch of metadata to help the server decide which content to send. The idea is to enhance the user experience. At least, this was the initial goal. **However, this hasn't changed since 1991**. Metadata are not specific to one user. There are probably thousands of visitors using Chrome 71 on Mac OS X 10.14.2 with the same settings (languages, etc.). So how do we "tag" a specific browser? Let me introduce you to Cookies.

When the browser makes the request with all these metadata, the server will respond with content and metadata as well. Let's see what is in the metadata of the server **response**:

```
  HTTP/2 200
  CACHE-CONTROL: private, no-cache, no-store, must-revalidate
  CONTENT-ENCODING: br
  CONTENT-TYPE: text/html; charset="utf-8"
  SET-COOKIE: VISITOR_ID=YTHGFRT54DER43; expires=Thu, 18-Apr-2019 14:32:14 GMT; path=/; domain=.www.new-york-public-library.com; priority=high
```

Let's translate it:

"Hey buddy! Welcome onboard and thanks for the information. The good news is I found your content (**`HTTP/2 200`**)

Don't worry, this is the latest version of the information you've requested. Actually, I will always send you the latest version (**`CACHE-CONTROL`**)

As requested, I've sent you the content compressed because it's faster this way (**CONTENT-ENCODING**)

It's in HTML because I know it's easier for you and it should be fine for your language [charset] (**CONTENT-TYPE**)

Oh! And because it's the first time I've seen you, I want us to become friends, so I'll call you YTHGFRT54DER43. This way, the next time you ask me for something, I will know who you are. I never forget who my friends are. (**SET-COOKIE**)"

Boom! Have you seen the **SET-COOKIE** instruction? The server generates a unique name for you, **especially for you**, that you are the only one to know. Each time you will visit this page, the request will include this cookie. This is how a server identifies you. Cookies are permanent. This means they will stay forever unless you manually remove them from the browser. They are not the history of the address you've visited, though. It's a different mechanism. It's a storage system inside the browser that's exclusively dedicated to the storage of cookies.

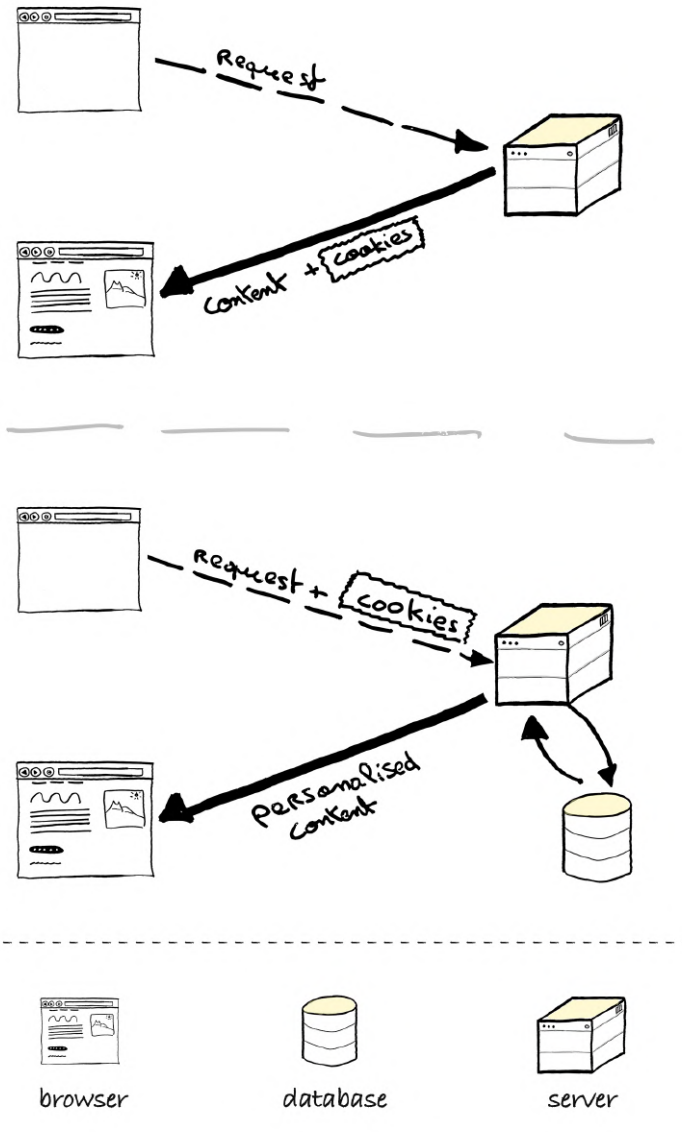
Cookies are domain-specific. They are specific to any given website. I'll explain: each server can set and read only the cookies that it has stored in its own domain. In our case: www.new-york-public-library.com. Therefore, when I visit www.google.com, I will have other cookies. Also, the name Google has assigned me will be different as well; it won't be YTHGFRT54DER43, but another one generated by the www.google.com server.

All right. You might be thinking, why are cookies important? First of all, they are vital to use the Web today. Because when you log into a website using you email and password, a cookie will identify you and it will display your content. Once you're logged in, the server sends a cookie back saying: *"I know you are Maria, each time you visit me I'll*

show you your content". Cookies prevents you from having to type your email and password each time you visit a website. Imagine the mess. The Web would be impossible to use without cookies. So in essence, cookies are not dangerous in themselves. They are just part of the protocol.

Here comes the dark side of cookies. Do you remember cookies are website-specific? Technically, that means www.google.com can't read the cookies used by www.new-york-public-library.com. But there is something I didn't mention: a website can request resources from different servers. Remember what you learnt about the Web browser? ***"[a web page] includes links to other resources"***. So for example, if www.new-york-public-library.com wants to sell books from Amazon, they can include a little piece of code on their website to display books from Amazon. This piece of code will make a request to www.amazon.com, which will then load the content from the Amazon server onto the New York Public Library website as long as you've visited www.amazon.com previously using the same browser. In other words, this piece of code allows the books displayed on www.new-york-public-library.com and sold by Amazon to be targeted at you. Because Amazon already knows what books you've bought or looked at. **This is how targeted ads work**. By adding trackers to web pages, websites can understand your profile and identify you. The more details they know, the more accurate ads will be.

This is just an overview. The bottom-line here is that the goal of cookies is to get to know you. We will expand on data and targeting later.


Request
Content + cookies
Request + cookies
personalised content
browser
database
server

HTTPS

The other topic you might encounter during your Web experience is SSL, also called HTTPS. Translated into plain English, it would be something like *"This website is insecure"*. Truth be told, the Web wasn't built to be a Telecom System. **It wasn't designed to be secure at all**. Everything was open. Why should we care about security in the context of an open Information System? We didn't have to. After all, the few people able to create content on the Web were scientists, researchers, and passionate people. They acted responsibly. They didn't need any security. They couldn't predict what the Internet would turn into.

But E-Commerce came into the game around 2000. Right about the time when the first Internet Bubble (the so-called *Dot-com Bubble*) burst. Online payments were starting to become a reality. Many websites and users became naturally concerned about the security of the Web. We are talking about credit card numbers, the most sensitive digital data we have. The Web stopped being *just* an Information System to become a marketplace. This is an important shift in the history of the Web. It's logical: why should we spend millions to build brick-and-mortar shops when we can build an online shop for a fraction of the cost and make it accessible to anyone with an Internet connection? The business opportunity was huge. It was too tempting to let it go. Capitalism at its best. So it happened.

HTTPS means HTTP **Secure**. How is the HTTP protocol secured? By introducing a notion of cryptography and a certificate. It would be so painful to explain this technology in detail. I care about you way too much to let you fall into the rabbit hole of security protocols.

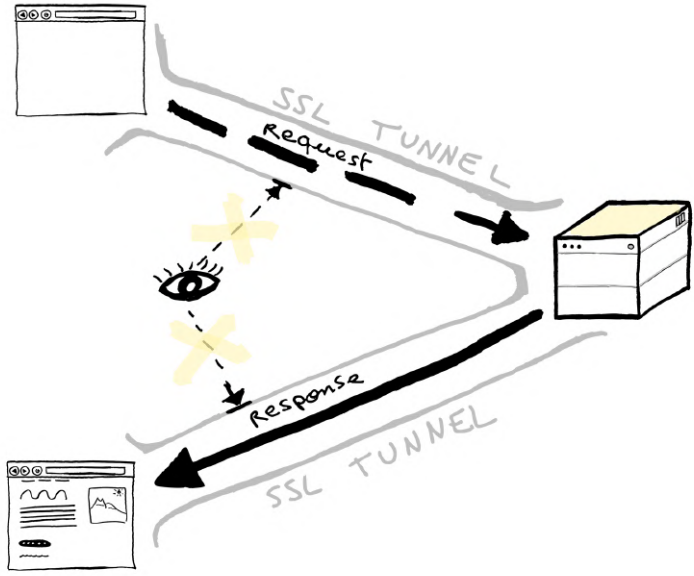
You could picture SSL as a tunnel between your browser and the website. Something like a channel between the client and the server. When you send data (make a request) to a server, this request will pass through many networks (switches) until it reaches the destination.

It's exactly like a shipping company. When you send a parcel, it leaves your local Post Office, then goes into a bigger delivery centre, then goes into a truck or an airplane, and at the end of the process it probably reaches the final destination through a delivery guy riding a bike (cf. The Internet Network chapter). In our example, your parcel is in a **black box** and during the whole process it remains hidden and secure. But it's different on the Web. Since there was no notion of security at all in the early days of the Internet, parcels were sent in a transparent box. Imagine you've sent someone a love letter and everyone in the process of the delivery is able to read it because the package itself is transparent. Even if the content is untouchable, anyone in the process could make a copy of it. And because there are many people involved in the process, if this letter got published on your behalf, we wouldn't be able to tell apart the original and the copy.

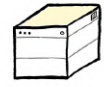
SSL is like putting this letter into a blackbox to make sure no one will be able to read it. The only information the carrier will know is the sender and the sendee. Another feature of SSL is that it guarantees you are sending the parcel to the right person. This is what certificates are for. Sometimes they expire and need renewal. That's why you see errors like *"This website is not secure"* or *"The SSL certificate is invalid"*.

There is a global awareness around HTTPS nowadays and all the players in the industry are doing everything they can to make sure all connections use the HTTPS protocol. **It really is a good thing**.

We all need to remember that we are using the Web to do things it wasn't designed for. We put a patch in a moment of urgency of growing businesses. So we need to start making the sustainable changes that will take us where we want to get. That is, to a more secure digital ecosystem.



browser



server

Data Storage

We've covered important concepts regarding the client/server architecture. This is the foundation of the Web. It's now important to turn our focus to the server and see how content is stored.

You might know some basics about databases even if you have never worked with a database. In any case, consider a database as an Excel spreadsheet, made with columns and rows. This is an example of a database:

ID	First Name	Last Name	Email	Country
1	Robert	Smith	robert.smith@example.com	France
2	Maria	Brown	maria.brown@example.com	Spain
3	John	Miller	john.miller@example.com	Italy
4	Sarah	Wilson	sarah.wilson@example.com	Portugal

A database is made up of multiple spreadsheets. We call them tables. The previous example could be the "Users" table. In the case of Facebook, for example, there will also be a "Posts" table to store all the posts you've shared. The Users and Posts tables are linked together thanks to the ID column. Because all rows have a unique ID. So the Posts table looks like this:

ID	Text	USER_ID
1	Happy new year everyone!	2
2	Thanks for your messages, I had a fantastic birthday :)	4

In this example, we know that Sarah Wilson (ID #4 in the Users table) shared an update: "Thanks for your messages, I had a fantastic birthday :)" because this row contains the USER_ID #4. I won't get into the nitty-gritty details of this topic. These are the basics of **relational databases**.

Now imagine this with millions of rows distributed across hundreds of tables dispatched from thousands of servers across the world. I'm talking about big companies here. But all websites work the same way. The developers will create a database scheme to define the best way to store data according to the specific needs of the website. The scheme will evolve as the website evolves. The goal is to save data effectively and avoid duplication. Then you can query everything you want any time. If we continue with the Facebook example, they also store the list of your friends and when you became friends. These "simple" data allow Facebook to draw a social graph about you to understand how many people you and another person have in common, for example.

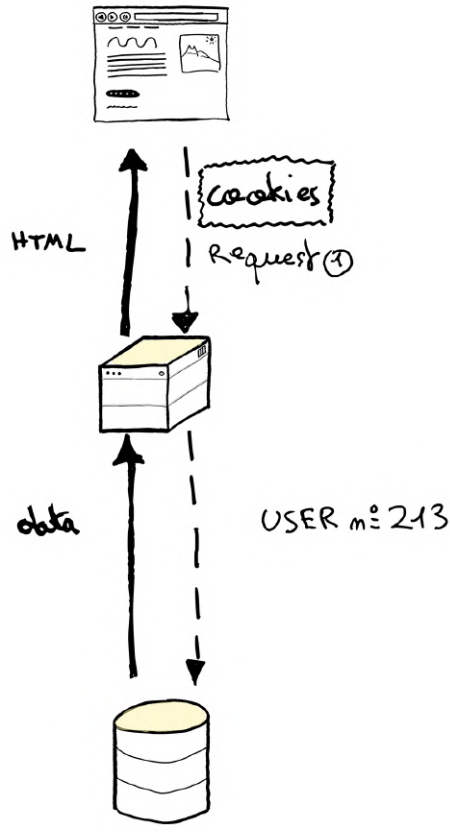
There is another aspect of storage which is media (e.g. pictures, videos, audio). This content is simply saved in servers with massive storage capability. It's similar to your computer as it’s organised in folders and files:

```
/users/damian/pictures/instagram-post-JTFRA6547842.png
/users/damian/pictures/instagram-post-JTFR12339876.png
/users/damian/videos/instagram-video-XDEA65332242.mp4
/users/damian/videos/instagram-video-XDEA76342298.mp4
```

Media are also converted into various formats to optimise the delivery. For example, YouTube won't send you a Full HD video to your phone if you are watching it with a poor connection. YouTube will send you a lighter version of the video. Similarly, every time you upload content, it's converted.

Content is not just converted, **it is also duplicated and hosted on different servers**. Here the concept of latency comes to play. Latency means "the time to travel from point A to point B". As of today, the Internet infrastructure sends packets at the speed of light, which is 300,000 km/second. It seems super fast, right?. But it's not enough if you want to provide a good user experience. I'll explain: the closer the server is to the client, the faster they will download the content. If you are in London and the server is in Los Angeles (distance: 8,758 km), the packets will be delivered in about 0.029 seconds. But if the server is in Amsterdam and you are still in London (distance: 341 km), the packet will arrive in 0.0011 sec. This is about 25x faster. Imagine this optimisation done on every request. Speak about time saving. It's like moving the library closer to your friends so they can get there faster.

That's why your content is duplicated across the world and hosted in various locations, that is, on various servers acting as mirrors. Technically speaking, your content will be hosted on a Content Delivery Network (CDN). Faster content equals more visits, more page views, more ads displayed, more user activity, more data generated, and thus more money. It's that simple.



browser

database

server

Logs

A log is a trace of a digital activity. There are a lot of different kinds of logs. Logs are intended to save data somewhere to be able to see if the software is working correctly. They are text-richer than databases. The database is a subset of the logs. It was invented early in the history of computers. It's a basic feature. For example, when you visit a website, you will generate logs at different stages of the process:

1) Your browser will log the address of the website with some metadata on your computer. Remember the cookie example? The log contains the date, device used, and anything useful.
2) The request will go through the network. Your WiFi router will log the request.
3) Then, the router will send the packet to your Internet provider. Your provider will also log the request (recording your name on each log).
4) Across the global Internet network, every switch will log the request.
5) The server itself will also create a log when it receives the request, with even more data because it knows who you are thanks to your cookies.

Logs are everywhere. They are also used for security reasons. If there is a criminal activity that needs investigating, the Police department in charge of the case will ask to see the logs from different sources depending on what they are looking for. So, here's one key concept to remember: logs are never destroyed. They are stored, saved, and used for everything. Logs are your history, they are here forever and will never disappear. Databases are also saved permanently. You might be confused between logs and databases. Both are

basically data: logs record your activity; databases record information about you.

We've come to the most important concept you have to understand from this book: **Your online activity is forever saved somewhere.**

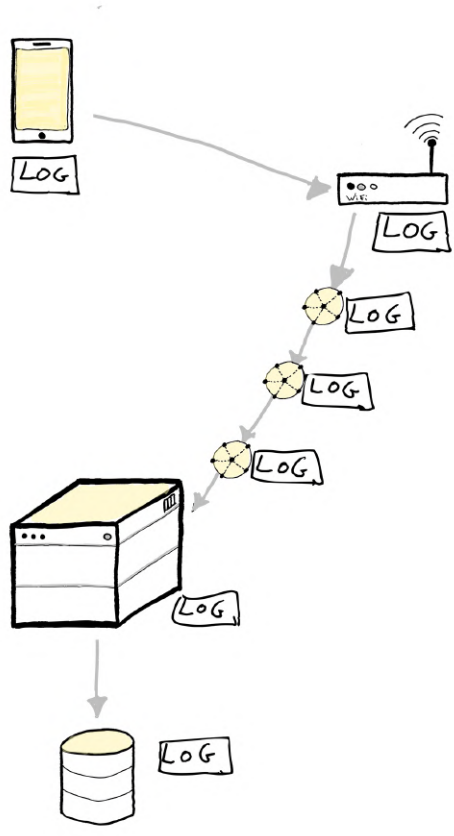
Every message you send, every emoji, every page you visit, every time you look at your phone. Even when you're doing nothing but just browsing around: your activity is logged. It's logged somewhere.

Logs can appear in different forms. They can be just files with content like this (one activity per line):

```
64.242.88.10 - - [07/Mar/2004:16:05:49 -0800] "GET /twiki/bin/edit/Main/
Double_bounce_sender?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12846
64.242.88.10 - - [07/Mar/2004:16:06:51 -0800] "GET /twiki/bin/rdiff/TWiki/
NewUserTemplate?rev1=1.3&rev2=1.2 HTTP/1.1" 200 4523
64.242.88.10 - - [07/Mar/2004:16:10:02 -0800] "GET /mailman/listinfo/hsdivision HTTP/1.1" 200 6291
64.242.88.10 - - [07/Mar/2004:16:11:58 -0800] "GET /twiki/bin/view/TWiki/WikiSyntax HTTP/1.1" 200
7352
64.242.88.10 - - [07/Mar/2004:16:20:55 -0800] "GET /twiki/bin/view/Main/DCCAndPostFix HTTP/1.1" 200
5253
64.242.88.10 - - [07/Mar/2004:16:23:12 -0800] "GET /twiki/bin/oops/TWiki/
AppendixFileSystem?template=oopsmore¶m1=1.12¶m2=1.12 HTTP/1.1" 200 11382
64.242.88.10 - - [07/Mar/2004:16:24:16 -0800] "GET /twiki/bin/view/Main/PeterThoeny HTTP/1.1" 200
4924
64.242.88.10 - - [07/Mar/2004:16:29:16 -0800] "GET /twiki/bin/edit/Main/
Header_checks?topicparent=Main.ConfigurationVariables HTTP/1.1" 401 12851
```

Logs can also be stored in a database in a more structured way. But all your online activity is recorded somewhere for an unlimited period of time. Logs and data are morphing into one single word: **data**. Historically, logs were stored in files but files are not convenient to query when you look for specific information or if you're trying to combine different logs. Companies realised the combination of logs and data combined were a powerful tool to better understand who you are. You might have heard the term **Big Data**. It's related to this. The more data we generate, the more power and storage we need to save it. And even more importantly: the more data there is the more powerful tech-

nology we need to **understand it**. Creating a detailed profile of you is about understanding your behaviour through the logs you generate. This is the foundation of the so-called **Machine Learning**, which is nothing but a bunch of algorithms that are used to predict your future based on your past activity.


LOG
LOG
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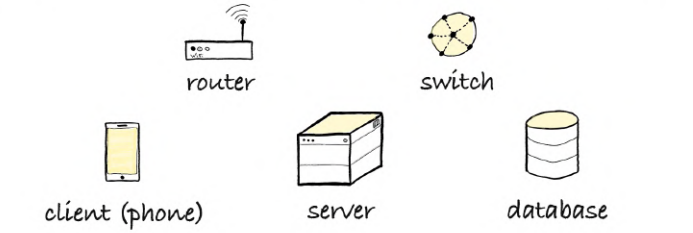

router
switch
client (phone)
server
database

Machine Learning

Take a breath. We are going to end the technical chapter on the least widely-known part of the Web: **how your data is used**. Back in 1991, where the first idea of the Web took shape, there was not a single business tracking users' online activity since there was nothing to sell online. But with E-Commerce, imagine how much value you can extract from visitors' preferences. It's like entering a shop with a list of the things you've bought this year, the things you like, the things you don't like, your age, your gender, your origin, your address, how many sexual encounters and social interactions you've had this year, the people you are sleeping with and what you are attracted to. Wow. It may seem like a lot. Well, as of today, we are close to this level of data.

So now we know how your online activity is logged and saved to link different sources of data. For example, in the Posts table on Facebook (cf. Data Storage), we know it was Sarah's birthday and she had a great time. It may seem like a small amount of information, but it actually speaks volumes about her. The text *"Thanks for your messages, I had a fantastic birthday :)"* contains precious information. "Thanks for your messages" means: she has friends who care about her, and the messages must have also been sent via Facebook Messenger, which Facebook can look at inside the Messenger database. "I had a fantastic birthday :)" means: she is in a good mood, but it won't last; it's special but temporary. It's the best moment to sell her new stuff.

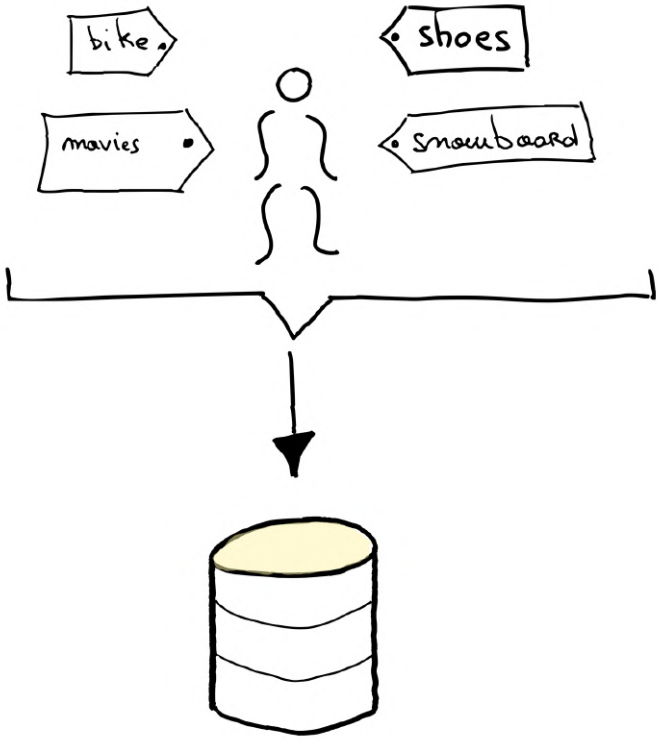
It's a very small example of how Machine Learning works. **It analyses content generated by you to create a profile of your personality and display the best ads for you.** The more you generate data, the more they know, the better suited to the *real* you the ads you get

will become. At this point, we can talk about two kinds of data: active and passive.

Active data is about the content you post directly: messages, pictures, videos, audio, everything you send. This includes interactions with your friends, your contacts, likes, comments, and the content you share. Passive data is about your navigation. Which websites you've visited, for how long, whose profiles you check on Facebook or Instagram, how frequently, how far you scroll on them, which stories you watch, how many times, who you stalk, and anything that may seem nothing to you. All of this is part of your *persona*. I would even say: **passive data says more about you than active data**.

Active and passive data create a map with your interests. This graph is connected to your friends, and obviously, it is connected to products that fit well inside this map. It's easier to sell you things you feel comfortable with.

Machine Learning is called Machine Learning because different **algorithms will learn about you through the data you generate**. When you surf the Web, you are feeding a big machine with your activity. This machine will rank everything you are doing to understand if it's important or not, or when it's important or not. And more importantly, it will cross data between you and people like you. Not specifically with your friends, but if Sarah loves art, fashion, and motorbikes, Facebook will analyse people with the same interests and see what they buy. Why? Because you are likely to buy the same products.



interest

database

The future is decentralised

We started looking at how the Web works and we finished by focusing on machine learning. It will be difficult to really grasp the ideas in the next chapter if you skip the Part I - Chapter 1. Take your time to read some parts again as you read the next chapter. It will surely clear things out.

The foundations of the Web are here to stay because we don't really know how to make it simpler. Most of the engineering work today is focused on making the development of websites and applications easier. Programming languages or hardware at large haven't evolved that much. Networks will become faster and accessible from anywhere with the upcoming 5G, but content will also become heavier and more abundant. So, in the end, our use of the Web won't change that much. We will have better quality pictures and videos because smartphones are getting better at this. Websites are becoming larger as well for the same reasons: better quality content, animations, videos, etc. Technically speaking, we are reaching the limit in terms of the exploitation of the initial capabilities of Web. The next step is about the Internet of Things, where multiple objects will be connected to the Web as well as to one another to exchange information and regulate their behaviour according to the environment. This data will be stored on servers as happens today. Also, we are likely to see contact lenses connected to the Web that will be able to project virtual content onto reality. This is called augmented reality. It's already here and it might play a bigger role in the next decade.

The other possible evolution is *"de-centralising"* the Web. Right now, we are living in a client/server architecture where we obviously depend on servers to navigate. Servers are controlled by a minority of people and this is the number one reason we see so much drama around data

ownership. Now, think about it: what if servers were yours and you could control all the content all the time? It's something that will be explored because it's technically possible and it will become easier in the future. Even Tim Berners-Lee himself, the creator of the very first server, has stepped back from his own invention to start working on de-centralised technologies: https://the-new-dope.com/link/solid. Just read the baseline of his latest work:

Solid was created by the inventor of the World Wide Web, ***Sir Tim Berners-Lee.*** *Its mission is to reshape the Web as we know it. Solid will foster a new breed of applications with capabilities above and beyond anything that exists today.*

PART I

CHAPTER 2

HOW TO MANAGE YOUR DIGITAL FOOTPRINT

Desktop Browser

The browser is the main entry point to the Internet. The history of web browsers is not very interesting but we have to remember who is behind these software and how it impacts the Web. As of today, the market is divided across Chrome, Firefox, Microsoft Edge (formerly Internet Explorer) and Safari. Of all of them, Firefox is the only one managed by a real non-profit organisation. This said, the Mozilla Foundation deserves to be mentioned and understood (https://foundation.mozilla.org). Basically, they provide an up-to-date, cross-platform, open source web browser for free. Open-source means any developer can see the code of the web browser. And any developer on the planet can verify there is nothing under the hood sending your data to someone else. The concept of open-source is a topic in itself. We will dig into it later on in the book. For the moment, let's keep focused on the browser. Firefox is available cross platform so it can be used on Mac-OS, Windows, Linux, Android, and iOS. Basically, the most popular operating systems as of today.

Chrome, Microsoft Edge, and Safari are built by private companies. They aren't open about how and why they use the data users generate. They surely have their own motivations to keep it a secret. After all, user data represent a valuable source of income for them. Since the Mozilla Foundation is the only organization without any commercial goals, we can say that Firefox is the safest browser to use. But we will

see how you can install some plugins on other browsers to ensure a better digital future for you.

I would like to introduce you to a simple strategy you can easily apply to your daily use of the Internet without making too many changes to your setup. It's just a few new habits you can learn that significantly impact your life.

Isolation: Different browsers for different things.

The first thing you can do is keep your main browser for communication-related tasks like emails, social networks, e-commerce, online services, etc. **Basically, any website that requires you to be logged in with your personal account.** You can use this browser for communicating or buying things, but only this. You should neither search on Google, nor read articles, nor watch videos on YouTube. In short, you shouldn't do any kind of activity that could help these companies gather and store information about your online behaviour, which they could then use to target your personal preferences with their ads.

You could use a secondary browser for searching, browsing and learning new things. You shouldn’t log into any of your social media accounts in this browser. This is important. Because you don't want to send new signals to Google, Facebook, Twitter or Amazon about what you are searching or reading now. This information, if you care about your privacy, should be isolated. Isolation is about not mixing the cookies stored in your browser.

Finally, you ought to use a third browser for work. You should use this browser –not your primary browser, which contains your personal

cookies– to log into any account you use for work. All professional websites you access from your personal computer should be accessed from a different browser.

This three-part isolation scheme is not perfect but it's a good starting point. We will see other strategies later on. Another thing you can do is search and browse the Web using the Incognito mode. All browsers have this feature. It opens up a window with no cookies or browsing history.

If you open new tabs in this incognito window, they will all be part of the same session (group of cookies). But as soon as you close the window, everything will be erased. This is to say, if you open up a new incognito window, your browser won't know anything about you, as there are no cookies with information about your past browsing activity. This way, a browser won't be able to *really* track you in the long run. The main advantage of incognito mode is that you won't be logged into any of your accounts (e.g. Facebook, Amazon, Google, Twitter, etc). So there’s no way to trace your account and match your digital activity with advertisers. Incognito mode is also a powerful tool to search for things in general. Because everything your search will be helpful to determine your taste, motivations, problems, etc. Advertisers have amazing algorithms to match your navigation with products.

Extensions

You are probably already using various extensions in your browser. Chrome and Firefox became famous for having a large catalog of extensions and a marketplace to find them. Many developers and companies created extensions to help you save or share content, or do a number of other things on the current website. Some extensions can be dangerous but I won't cover everything here. As a rule of thumb,

only download extensions directly from the browser extension store of your browser. Never from another website. Also, download only extensions with a lot of positive reviews and great comments. Dangerous extensions can inject malicious code to save information about you: cookies, history, and other data. It's important to reduce the number of extensions you are using and also check if they are well-rated and stable. Avoid shinny, new extensions. Here, I'll introduce you to some powerful extensions to protect your privacy and even make your navigation faster.

HTTPS Everywhere: Each time you send information by sending a form, your data is sent to a server. This extension ensures all data is encrypted by using the HTTPS channel to the server. You can read the HTTPS chapter to gain a better understanding of HTTPS.

Ad Block Plus: It will block much of the advertising code running on websites that displays ads on your browser. Ad Block Plus helps minimise the tracking a site does of you; this, in turn, leads to bandwidth savings, because less content is downloaded by the browser.

Ghostery: A simple way to block more than 2,000 different trackers. Powerful and simple. It’s a must-have.

These extensions will provide additional security to your browsing activity, which, as we have already discussed, should be done under isolation. All of the three browsers covered in the Isolation section, allow the installation of extensions. I recommend you to take a look at all the extensions that are currently installed on your browser and remove the ones you're not using. Even if you remove an important one, you won't lose any data, just download it again.

There is still a catch. These extensions won't stop a website from tracking your activity. I'll explain: the websites you use are likely to include external trackers like Facebook, Google Analytics, or other ones. Your extensions will block this type of trackers. However, there is no way to stop a website from tracking and saving data that has been gathered from internal sources. For example, Pinterest, Instagram, Facebook, and many big websites have an internal tracking system. They will analyse your activity on the website to push you better content. It all happens internally. That means you can't prevent this from happening by using any extension.

When you're browsing instagram.com, the website (and the mobile application) will log all the profiles you've visited, the pictures you've liked, the pictures you've spent time on, etc. Everything that can help the system understand your taste will be logged, saved and fed to their algorithm.

These are some real examples of tracking done on Instagram. It's actually easy to see these requests from the browser and the built-in inspector (installed by default on Google Chrome, Firefox, and others). When filtering the requests executed on your behalf, you can extract some surprising data. For example, when you visit a profile, Instagram sends a lot of metadata to their own server. This is the data tracked when I visit a profile:

```
{
  "app_id": "9366192459",
  "app_ver": "1.0.0",
  "data": [
    {
      "time": 1553270666.254,
      "name": "instagram_web_time_spent_bit_array",
      "extra": {
        "ig_userid": 16728701,
        "pk": 16728701,
        "rollout_hash": "ed084640fcc2",
        "qe": {
          "sdc": "control_01_23",
          "bundle": "control",
          "igwlspe": "has_prefetch",
          "comment_enhance": "mobile"
        },
        "app_id": "936619743392459",
        "tos_id": "fu4auv",
        "start_time": 1553270664,
        "tos_array": [
          7,
          0
        ],
        "tos_len": 3,
        "tos_seq": 4,
        "tos_cum": 9,
        "log_time": 1553270666253,
        "referrer": "https://www.instagram.com/",
        "referrer_domain": "www.instagram.com",
        "url": "/",
        "original_referrer": "",
        "original_referrer_domain": ""
      }
    },
    {
      "time": 1553270666.96,
      "name": "instagram_web_time_spent_navigation",
      "extra": {
        "ig_userid": 16728701,
        "pk": 16728701,
        "rollout_hash": "ed084640fcc2",
        "qe": {
          "sdc": "control_01_23",
          "bundle": "control",
          "igwlspe": "has_prefetch",
          "comment_enhance": "mobile",
          "felix": "test",
          "igtv_public_viewing": "control"
        },
```

```
        "app_id": "936619743392459",
        "event": "transition",
        "client_time": 1553270666959,
        "time_spent_id": "fu4auv",
        "extra_data": {},
        "source_endpoint": "feedPage",
        "dest_endpoint": "profilePage",
        "referrer": "https://www.instagram.com/jordansoutherland25/",
        "referrer_domain": "www.instagram.com",
        "url": "/jordansoutherland25/",
        "original_referrer": "",
        "original_referrer_domain": ""
      }
    },
    {
      "time": 1553270666.97,
      "name": "instagram_web_client_events",
      "extra": {
        "event_type": "page_view",
        "ig_userid": 16728701,
        "pk": 16728701,
        "rollout_hash": "ed084640fcc2",
        "qe": {
          "sdc": "control_01_23",
          "bundle": "control",
          "igwlspe": "has_prefetch",
          "comment_enhance": "mobile",
          "felix": "test",
          "igtv_public_viewing": "control"
        },
        "app_id": "936619743392459",
        "page_id": "profilePage_261534207",
        "referrer": "https://www.instagram.com/jordansoutherland25/",
        "referrer_domain": "www.instagram.com",
        "original_referrer": "",
        "original_referrer_domain": ""
      },
      "module": "profilePage",
      "obj_type": "url",
      "obj_id": "/jordansoutherland25/"
    }
  ],
  "log_type": "client_event",
  "seq": 3,
  "session_id": "169a668",
  "device_id": "XI6NOQMtVKF"
}
```

It isn’t practical to list all the trackers used by all websites in this book. You just need to remember every action you take on certain websites will be first tracked and then analysed. This is the best way they have to understand you. By crossing data regarding your behaviour, we can draw a clear picture of your tastes and affinities. Data about your browsing activity is sent to the system every five seconds. Imagine how much data is tracked in 10 minutes of scrolling through Instagram. Everything is logged: every profile you've looked at, how far you’ve scrolled through their pictures, your searches, every "passive" data. And you can't stop it because these websites might stop working for you if you block those internal trackers.

Mobile browser

Most part of the Internet consumption today is done on a mobile device. The two dominant platforms are iOS and Android, managed by Apple and Google, respectively. Both mobile operating systems come with a default browser: Safari (iOS) and Chrome (Android). You can also use Chrome on iOS if you like. The good news is all mobile browsers have an Incognito mode as well. I highly recommend you using the private browsing functionality of your mobile browser (Incognito mode). This way you will reduce the chances of accumulating cookies. It's the best isolation strategy you can use. You can refer to the Desktop Browser section above to learn more about browsers and cookies. Keep in mind browsers work the same way on a mobile device. A browser always needs cookies to work correctly. It also needs a search engine, and the same component as a desktop browser. One of the few differences is that mobile browsers are less flexible because they don't offer support for extensions.

This said, if you prefer to go keep using the Mozilla ecosystem, there is an alternative you can try: **Firefox Focus**. You can find this applica-

tion on iOS and Android by going to their respective app stores. Firefox Focus is a single-window browser which resets every time you open it. It preserves your privacy by clearing all your previous activity after each visit. It's a convenient Incognito mode. There is also the classic Firefox mobile browser with Incognito mode and multi-tab management. I actually like the Firefox classic version on mobile. You really should give it a try. The Mozilla Foundation deserves an ovation for the work they do. It's so difficult to develop, maintain and update technology for such a wide variety of operating systems at this level.

You might also be familiar with "in-app" browsing: some mobile applications won't redirect you to Safari or Chrome when you click on a link. They will open in a browser built into the app to avoid losing you. It's a trick to keep you inside the application for as long as possible and it's also convenient to navigate. All the navigation inside this window will be tracked by the parent application and analysed. This shouldn't come as a surprise at this point: everything is tracked.

Limiting Ad Tracking

Even though we tend to click on "yes" on every pop-up alert, all platforms today have to ask for permission to collect our data. We will cover specific permissions later but this one is not very well-known. If you go into the settings of your phone, you should be able to turn off all shared analytics, an option located under the Privacy section. You can also turn on "Limit Ad Tracking" in iOS, under "Settings > Privacy (scroll down) >Advertising". The location of these settings may change over time so remember to disable ad tracking on your phone. If you want to navigate more safely, you need to do your homework and explore the settings of your phone one by one.

Each phone has a unique identifier, which is linked to your personal profile. It works like cookies but on your entire phone. That means Advertisers can target you based on your phone activity and send better-suited ads through their network of displayed content. Turning tracking off will reduce the targeting and hinder the data-gathering process.

It's not very clear how much data activating this option will block but it's always advisable to turn off any tracker possible. Everything we can do to reduce the collection of data is a step in the right direction. As you're starting to realise, trackers are everywhere. It's a long journey, but there's a way around them.

Applications

The next chapters are going to cover some mobile applications-specific features. The first rule of thumb is to keep the amount of applications on your phone to the minimum possible. Whatever your operating system, reducing the number of apps will systematically limit the risk of exposing your data to the outside. You can start with this: take the time take an in-depth look at your phone and remove every app you haven't actively used in the past week. Chances are you are using only about 5 applications per day, and 20 per week. Everything else can be removed. Don’t panic. You can always re-install applications at anytime. Remember, most applications are just clients, so you won’t lose your actual data.

An important concept when it comes to mobile applications is this: *All applications are not equal*. We tend to think *"This is just another app"*, but some of them will track more data than you may want to believe. Some of them will learn more about you than others. That's why removing the extra , unnecessary apps is an important step. Please try to bring the number of total installed apps down to 30. More than this is a sign you have fear of missing out on stuff. Don't forget you can

also use websites instead of applications. But you need to start with this. This is about becoming a tech minimalist and keeping only what you're really using. Try to turn this into a habit to help you clean up your phone every two or three months.

Once you've done that, it is time to check your application permissions. Let's go.

Microphone

One of the motivations to write this book comes from the unexpected success of one blog post I wrote back in August 2017. I experimented a weird adventure in Spain with Instagram and my smartphone microphone. You can read it here: https://the-new-dope.com/link/instagram. It's a five-minute read and I recommend you check it out. In short: I strongly suspected Instagram was listening to us in the background, extracting words (mostly products) from our conversations, and selling this information to advertisers. I was talking with my cousin about a product I was thinking of buying. My phone was in my backpack at that moment. The day after, I checked my Instagram feed and a sponsored post about this product popped out. It's hard to believe in coincidences in this machine learning world.

Normally, every application using your microphone will ask you for permission to use it. The most common applications requesting access to your mic are communication apps like Facebook Messenger or WhatsApp. They need microphone access to allow you to call people and talk with them. Or to record audio messages. It makes sense in this case but, once again, not all applications are the same. Instagram is a specific case where you can't use one of its main features (stories) without giving full access to your camera and microphone. Why? Any

user should be able to pick a picture from their phone library and post it without giving permission to their microphone. It doesn't make sense to me at all. But we just click on "yes" to post stuff. I trust none of the giant corporations about these things. What would stop them from activating the microphone in the background? The benefits can be huge. We will probably see more and more scandals about microphone access and privacy intrusion in the next 10 years. However, this is *just* the starting point. You can absolutely expect to be tracked more and more. It's going to happen, better get ready now.

I suggest that you go to *Settings* > *Privacy* > *Microphone*. If this isn't the exact location, be curious and browse through the settings menu of your phone until you find it. All applications with access to you microphone will be listed here. You will be able to turn off permission for microphone use in the apps you don't know or the ones you simply want to block. Because you've cleaned up your applications in the first place, you should know every app on this list. If there is still an app you don't know, don't waste your time turning off permissions and just remove the app from your phone all together.

Even if the application *really* needs access to this tool and you've turned it off, don't worry. The app will ask you for permission to use your mic when it needs it again. It's better to be a notch too paranoid at the beginning and start turning on things one by one as times goes by. This is how to take control of your digital life.

As of today, there are many voice recognition tools. Google Assistant and Apple's Siri are the most known ones. Followed by Alexa from Amazon. They are sold as assistants for your daily life, but to act as a real assistant, they have to know you. That's where machine learning comes into play again. To analyse your data and understand your needs we need data first. In the case of voice assistants, voice is con-

verted into text; then, specific words are extracted from your sentences. For example, Siri already listens to everything you say and will start only when you say "Hey Siri'. Don’t you find this scary? Why is it the default setting? Because it's listening to you 24/7/365. Please turn this feature off right now. If you are a Siri user and you love this feature: you've been warned. Siri can still be summoned by press-clicking the power or home button (depending on model) as well, so avoid taking any unnecessary risks. Sometimes convenience comes at a high cost. If you still want to use this feature, you are free to do whatever you want, but everything you say will be somewhere out of your hands. Having sex close to you phone? They probably know. Talking about your ex? Talking about your most intimate relationship issues? Talking about illegal things? It's somewhere waiting for you. Don’t let your decisions backfire on you.

Siri is not the only example. Actually, Siri might probably be the least harmful because Apple is not in the data business. I would definitely be more scared of Google and Amazon. Voice recognition technology is here to stay and you can be sure resources will be allocated to make it better every day. Machine learning will also become increasingly better at picking up on specific cues, regardless of language or situation. At some point we will have become super predictable.

Geolocation

Your location says more about you than you think. Where you are is still the best indicator of who you are and what you do on a daily basis. Your position provides crucial information about you. Even if you stay at home everyday is valuable data to collect about you. Crossing geolocation with web navigation patterns builds a highway for data analysis. It's also key to our privacy.

How did we move from being tremendously scared of having our phones wiretapped twenty years ago to carrying high-precision GPS devices on us everyday? Social Media companies did an excellent job at this brain switch. *Bravo!* Now close your eyes and think about it. Nearly all your applications require geolocation. Not only navigation-specific apps, but also social media apps. Why? To be able to "tag" the location where you took the picture you're about to upload. Because it's cool. Coolness is the number-one issue with Social Media apps and we will cover it extensively in the Part II of the book.

For now, remember your phone is probably sending your location multiple times per hour. Once again, go to your settings and turn off geolocation access for all the applications. Don't worry, like it happened with the microphone, you will be able to turn it back on when needed. Just do it now. You might be surprised by how many applications have access to your location.

If you look closer, some applications will allow you to adjust how restrictive you want this permission to be. You have 3 different options to choose from:

1) No GPS access at all.
2) GPS access only when using the app.
3) GPS access all the time, even in the background.

Most applications will ask you to set option #02 but some others will ask to set option #03. Just set everything to option #01 for now. The next time an app asks you for permission to access your GPS information, just set it to option #02. It's safer. Option #03 means you don't even know when the app is collecting data and we don't know how this data is used by the service collecting it. You've probably seen some articles or scandals with headlines similar to *"App X has been collecting data about their users in the background without warning them"*.

It's true, companies are storing your location, but it's false they didn't warn you. Users are warned when they are asked for permission. It clearly says: "For a better user experience, this app might collect and use your geolocation at any moment". We just click on “Yes”, which of course opens the door to everything.

In order to get your precise position, your phone will use various inputs. The built-in GPS chip is not super advanced and won't be as precise as a real GPS device. It's actually an A-GPS (Assisted Global Positioning System) and it uses your carrier's network to geolocate your phone. First because it would be expensive to put real GPS chips inside a phone; and, secondly, because the GPS chips that are installed in phones are designed to be energy-efficient. Meaning they have to be small enough in order to prevent the battery from draining in an hour. Let's say we have a 50-meter precision with the A-GPS. To get closer to a 5-meter accuracy, the phone will use its built-in WiFi to detect networks around you and their distance to you. Remember: the A-GPS chip inside your phone will use your carrier's network to determine your position as well as using your WiFi connectivity. So, by using it, you are directly telling your carrier where you are.

It's really hard to turn off GPS permissions completely because some apps like Maps need them. But for anything else like social media apps, it sounds crazy to have this permission turned on. From now on, think twice before accepting. There are countless scandals about data leaks concerning users’ geolocation. And the worst is, things are going to get *even* uglier. We are simply not aware of how companies are really using this data, yet we trade our security for a picture with a geotag on it. We expose ourselves so much sometimes just to *look cool*. Learn to distrust corporations who claim they have your back. Any drug dealer will tell you they are selling you the best product be-

cause they want you to come back again. The same applies to apps and permissions.

WiFi and Bluetooth

WiFi (short for **Wi**reless **Fi**delity) became popular when laptops and smartphones became affordable. Is there a better way to be connected than without cables? It's honestly magic when you think about it. WiFi is the result of the evolution of radio signals. The concept is the same: they both aim at transmitting information through radio waves. In general terms, high frequencies equal to more data transferred per second. But there is a limit on the physical range over which you can broadcast such a signal. Just as it's hard to run fast for a long period of time, it's hard to broadcast high frequency signals over long distances. That's the main reason regular WiFi hotspots have about 50 meters of usable range. There are many obstacles that may impact the quality of the signal received by a device; like the weather, the physical barriers between the hotspot and the device, interferences with other WiFi signals or the actual range capacity of the device. This might justify why you've experienced a strong WiFi signal, meaning a fast connexion, at 200 meters but a very weak one at 10 meters. The Bluetooth mechanism is similar. That's why I'll put WiFi and Bluetooth in the same category. To simplify. WiFi is good to work using the TCP/IP protocol and to connect devices to a global network. You can do many things with WiFi but in 99% of the cases the task involves connecting a device to the Internet. Basically it just replaces a classical wire. Thanks to TCP/IP, your computer will work exactly the same way when connected through either an Ethernet cable or WiFi.

Bluetooth is another protocol, through which you can also transmit data and connect a device to the Internet. By this point, you must al-

ready have shared your smartphone's 3G/4G connection with your laptop through Bluetooth. The difference with WiFi is not that big, at least technically speaking. Each of them exists to do different jobs. However, I suspect they will fuse into one in the next decade. That would allow more devices from different protocols to be connected using the same specifications.

The foundations of wireless connectivity, WiFi and Bluetooth, revolve around the concept of **MAC addresses**. Each device has a unique MAC address for each connectivity endpoint. Nothing to do with Apple and the Macintosh: it stands for **Media Access Control (MAC)**. I'll explain: your smartphone can connect to another device via WiFi or Bluetooth, or even both at the same time. Because they have two different internal components: a WiFi card and a Bluetooth card. Even if they are small, they are separate and work independently of one another. A MAC address is generated at the time the component is created. It looks like this: **`03:13:18:84:d3:88.`** A MAC address is a 12-character hexadecimal code, using numerals "0"–"9" and letters "A"–"F". There are 16 possibilities for each of the 12 characters. So there are 281,474,976,710,656 possible MAC addresses. More than 280 trillion possibilities. Needless to say we are far from reaching that figure. It would be the equivalent of 40,000 MAC addresses per human being if we estimate there are over 7 billion humans on this planet. Said this, each smartphone has a unique MAC address. It is how WiFi and Bluetooth works. MAC addresses are to Wifi and Bluetooth what IP addresses are to TCP/IP, but related to connectivity instead of hardware. It's an origin and destination point to forward the right data to the right device. Remember, a smartphone has a unique MAC address that you can't change. It's got a unique fingerprint. If someone knows your MAC address, basically they know who you are. On a laptop you can change your MAC address but you need some command line knowledge to do that. However, you can only change the MAC

address on a laptop temporarily because it only affects the operating system, not the hardware itself. It's a permanent serial number a device is assigned as it comes out of the factory: impossible to change.

I'm going to take smartphones as an example but the exact same technology is used on any device with WiFi connectivity (e.g. laptops, tablets, etc). Imagine you are in a coffee shop and you want to connect to the WiFi network provided by the café. You turn on the WiFi on your phone, scan for available signals around you, pick the one named "Super Coffee", enter the password the waitress just gave you, and *boom!,* you are now connected to Internet. Let's explain each step of this process: when you turn on the WiFi connection on your smartphone, it starts scanning for available signals. The three things you will see are: the name of the signal (in my example "Super Coffee"), the strength of the signal (the stronger, the faster), and the level of security associated to it (essentially, it'll say if the network is password-protected or not). Before going further we have to understand how is it possible that your phone knows all this information without even being connected to any WiFi network. **Every WiFi router broadcasts its identity passively**. This identity is composed of a human-readable title (like "Super Coffee"), a MAC address, and a security configuration (and more, but we'll skip the details). The strength of the signal is calculated by your smartphone, not by the router. The smartphone will estimate a certain distance between you and the router by counting how much data per second can be transmitted via radio waves. It's pure physics at this point. The router always emits a signal saying: "Hi, I'm Super Coffee, you can reach me with this MAC address: 11:22:33:44:55:66. I'm using the 2.4 GHz radio frequency, channel 1, and I need a WPA2 password if you want to join me". This is continuously broadcast by all routers. That means when the WiFi of your phone is on, it is constantly scanning the routers around you. And we know all WiFi-enabled de-

vices, both smartphones and routers, have a unique MAC , which, as you already know, contains precious information. Having your Wifi on helps determine your geolocation more accurately even if you are not connected to any network. The phone will calculate the distance of all the signals around you to estimate where you are by a technic called "triangulation". Simple passive data gathering. Let's turn back to the process. Now you know there is a "Super Coffee" WiFi network available near you (the phone displays 3/3 bars, which sounds good) and it requires a password. (I will skip explaining the different WiFi standards, but, essentially, any network requiring a password will basically encrypt the transmission of data between your smartphone and the WiFi router.) After entering the right password, you will be physically connected to the router, meaning you will be exchanging data using the same radio frequency. At this point, the router will give you a temporary IP address, and then you will be able to access the Internet.

WiFi and Bluetooth security is a huge topic in itself. Even when you are connected to a secure WiFi network, people can listen to your online activity and this is how many data leaks happened recently. Hackers can use a self-explanatory technique called "Man In The Middle" to intercept the traffic between your smartphone and the router in a transparent way. It's not easy and it won't work in all scenarios but it's possible. We will talk about VPN later to see how to fix this vulnerability although it's a bit outside of the scope of this book. In this chapter, though, I prefer to focus on passive data gathering rather than on security vulnerabilities.

Long story short, the easiest solution for now is to turn your WiFi connection OFF completely when you are not using it. There is a silly new functionality on iOS that allows three different WiFi statuses: OFF, ON, or ON but inactive. “OFF" means it is switched off, so there is no

network scanning; it also means no one can see you. Read this carefully: if your WiFi connection is off, no routers know you exist. “ON" means you are actively scanning for networks and routers *see* you're around. If your phone already knows one of them, it will automatically connect to it. The last mode, the silly one, "ON but inactive”, means your WiFi is always scanning for networks around you but won't connect to any of them. However, you are still visible to other routers. They can still know where you are with precision. This mode just means it won't connect to any network automatically. In iOS, when you go to Settings > WiFi and you turn it "OFF", it's completely off. But if you click on the WiFi icon in the notification centre, it will be greyed, which means your WiFi connection will be set to "ON but inactive”, not to “OFF”. It's a trick to have your WiFi “ON" as long as possible. But, you know, we are too lazy to tap the screen three times to get to Settings > WiFi > “OFF". We prefer to swipe down and single-tap on the WiFi icon to "deactivate" it. Even if, as we have already discussed, it will not be fully deactivated.

The amount of wireless signals will only increase over time and a lot of "smart devices" will use WiFi or Bluetooth, or a combination of both, to get connected. It's important to understand these basics concepts because they haven't changed for decades and they won't change until we find a totally new way of using radio waves. Don't expected it to happen anytime soon. Even if we do find a new way, it will surely be worse than what we have today.

Pictures

When you give applications access to your camera roll, they can access it at anytime whether they are running in the foreground or the background. The permission is always ON once accepted and there is

no restriction on the pictures an app can access. In other words, apps with access to your photos can analyse your whole albums. They can analyse pictures directly on the device without sending them to an external server. Or they can highly compress pictures before sending them to make the process light and fast. The goal of picture analysis is to tag pictures with words to understand what is on them. In other words, you're giving an app a set of "digital eyes". Once it knows you by your words, an application can cross this data with your pictures to get a better sense of who you are. This includes nudes, of course.

What's wrong with this? It's dangerous because phones are getting more powerful each year. They have the capacity to process a large number of pictures per second to recognise faces, context, products, places, and anything you can see on a picture, really. Most people change their phone only to have a better camera. Because we are already pushing the limits in terms of hardware. Camera quality is one of the few areas we can still improve on. The lenses inside our phones are close to reaching the standards of professional cameras. We can take 24MP pictures right from our pocket. No one would have predicted this 20 years ago. Pictures are becoming part of our everyday life. In 2014, we uploaded 3.2 billion photos each month. This figure will surely go through the roof in 2019 and it's not as if it's going to stop. The Part II will cover how this is currently changing the world. However, for now I just want you to understand the most simple mechanism of your phone.

Like with the other permissions, go to your settings and remove access to Camera Roll for all applications. That will reduce the probability of exposing your personal albums. Technology is likely enable us to very precisely analyse pictures in the next 10 years. Machine learning is already doing an amazing job at this and it's a technology worth investing in because it has many valuable applications. For example, algorithms can detect non-appropriate material with high accuracy.

YouTube, Facebook, and other giants are training algorithms at a massive scale to help in identifying sensitive material. It's also one of the core components of Instagram. Let's wait a bit before we turn to the fundamentals of social media. Don't worry, we will get there. Pictures are now becoming as clear to machines as words and sentences. The last invisible part of pictures is metadata. Called EXIF, it keeps all the information of a picture inside the file, though it is invisible to us. However, any application can read this data. It contains the date, the ISO profile, sometimes the GPS coordinates, the model of the camera used, and ton of information. You are inadvertently sending this metadata to companies but you ultimately don't know what they will do with it.

This is an example of the metadata of a random picture taken with my iPhone:

```
kMDItemAcquisitionMake    = "Apple"
kMDItemAcquisitionModel   = "iPhone X"
kMDItemAltitude     = 181.2713470442554
kMDItemAperture     = 1.69599381283836
kMDItemBitsPerSample    = 32
kMDItemColorSpace     = "RGB"
kMDItemContentCreationDate   = 2019-02-26 20:51:08 +0000
kMDItemContentCreationDate_Ranking = 2019-02-26 00:00:00 +0000
kMDItemContentModificationDate  = 2019-02-26 20:51:08 +0000
kMDItemContentType     = "public.jpeg"
kMDItemContentTypeTree    = (
 "public.jpeg",
 "public.item",
 "public.data",
 "public.image",
 "public.jpeg",
 "public.content"
)
kMDItemCreator      = "12.1.4"
kMDItemDateAdded     = 2019-02-26 20:51:23 +0000
kMDItemDateAdded_Ranking   = 2019-02-26 00:00:00 +0000
kMDItemDisplayName     = "2019-02-26 21.51.08.jpg"
kMDItemEXIFVersion     = "2.2.1"
kMDItemExposureMode    = 0
kMDItemExposureProgram    = 2
kMDItemExposureTimeSeconds   = 0.05882352941176471
kMDItemFlashOnOff     = 0
kMDItemFNumber      = 1.8
kMDItemFocalLength     = 4
kMDItemFocalLength35mm    = 28
kMDItemFSContentChangeDate   = 2019-02-26 20:51:08 +0000
kMDItemFSCreationDate    = 2019-02-26 20:51:08 +0000
kMDItemFSCreatorCode    = ""
kMDItemFSFinderFlags    = 0
kMDItemFSHasCustomIcon    = (null)
```

```
kMDItemFSInvisible     = 0
kMDItemFSIsExtensionHidden   = 0
kMDItemFSIsStationery    = (null)
kMDItemFSLabel      = 0
kMDItemFSName      = "2019-02-26 21.51.08.jpg"
kMDItemFSNodeCount     = (null)
kMDItemFSOwnerGroupID    = 20
kMDItemFSOwnerUserID    = 501
kMDItemFSSize      = 2026644
kMDItemFSTypeCode     = ""
kMDItemGPSDateStamp    = "2019:02:26"
kMDItemGPSDestBearing    = 171.105178857448
kMDItemHasAlphaChannel    = 0
kMDItemImageDirection    = 171.105178857448
kMDItemInterestingDate_Ranking  = 2019-02-26 00:00:00 +0000
kMDItemISOSpeed     = 50
kMDItemKind      = "JPEG image"
kMDItemLastUsedDate    = 2019-02-26 20:51:50 +0000
kMDItemLastUsedDate_Ranking  = 2019-02-26 00:00:00 +0000
kMDItemLatitude     = 43.310745
kMDItemLogicalSize     = 2026644
kMDItemLongitude     = -0.3732533333333333
kMDItemMeteringMode    = 5
kMDItemOrientation     = 1
kMDItemPhysicalSize    = 2027520
kMDItemPixelCount     = 12192768
kMDItemPixelHeight     = 4032
kMDItemPixelWidth     = 3024
kMDItemProfileName     = "Display P3"
kMDItemRedEyeOnOff     = 0
kMDItemResolutionHeightDPI   = 72
kMDItemResolutionWidthDPI   = 72
kMDItemSpeed      = 0.7221983671181245
kMDItemTimestamp     = "20:51:08"
kMDItemUseCount     = 3
kMDItemUsedDates     = (
 "2019-02-25 23:00:00 +0000"
)
kMDItemWhiteBalance    = 0
```

All these numbers might be confusing but they have real-world value. Notice the fields **kMDItemLatitude** and **kMDItemLongitude**. They sound familiar right? Also look at **kMDItemAcquisitionMake** (Apple), **kMDItemAcquisitionModel** (iPhone X), **kMDItemSpeed** (the speed at which I took the picture: 0.722 km/h., which means I wasn't moving), **kMDItemAltitude** (181.2 meters above sea level) or **kMDItemCreator** (version of iOS I'm using). You can known what all these field mean by visiting the following website: https://www.exiv2.org/tags.html. Welcome to Data Paradise. Companies don't need your picture metadata to know what smartphone you are using. There are easier ways to retrieve this information, like HTTP Headers, which were explained in the Web Browser Section. The same goes for GPS position. However, the combination of the model of the device, the location, the picture itself, the altitude, the speed, etc. provides ultra valuable information about you. Remember: these pictures are stored on servers you don't control, for a period you don't know, and they are in the hands of people you can't ultimately trust. Think twice before posting your next Instagram meal.

Camera

We've already talked about the pictures on your phone. It's time to turn our focus to the camera itself. You can include webcams and any other form of lenses in this chapter. Basically they are *eyes* connected to the Internet. It is hard to confirm but there are chances a camera can be remotely activated on demand to spy on people. This could be useful if the Government wanted to track down someone involved in some dirty business. But is it done for real? While this may be true, a lot of mystery and few real answers surround this question. Edward Snowden stated the NSA had had this capability and it had been actively using it for a long time . The digital journey you've embarked on

with this book is based on purely factual technical knowledge. So the only thing I can confirm is: it is totally possible to spy on you through your camera even if you think it's off. Since it's possible, I assume it is done. I highly recommend covering your phone's cameras and your laptop's webcam with something when you are not using it. You will find plenty of accessories on Internet for less than $5.

Please do the same as with the other permissions: turn OFF camera access for all applications. Then allow access when an application you trust needs to use your camera. That won't prevent malicious camera activation at a system level, but once again, it will at least reduce the possibilities of data being leaked. The TV show Black Mirror did an episode showing the danger "webcam tapping" can pose to our society. Imagine for a moment you've got caught doing intimate things in front of your computer or phone. If someone has exclusive access to this content, what prevents that *someone* from asking for a ransom in exchange for not publishing it? It's not impossible. And this kind of extortion practice already exists. Just be careful with camera access and don't allow all applications to use it.

Another important topic we need to address when it comes to images is machine learning. As explained before, our ability to analyse images and videos is phenomenal. In five or ten years from now, we will be able to understand where you are and with whom, after analysing just five seconds of video. Machine learning will also enable us to recognise any element in an image to know, for example, the brands you are wearing, your mood, the weather, and absolutely anything you can possibly think of. Do you know Google captcha? This thing you have to do to confirm you are "a human being". It's used on many websites when signing up. Google shows you a gallery of images and asks you to select the pictures that contain a truck, or a bike, or whatever. Google actually trains its image-recognition algorithm

through you. Qualifying data is the first step to building powerful and solid machine learning technology. You need to train the algorithm to recognise patterns in a gallery of random pictures.

VPN

VPN stands for Virtual Private Network. It was invented to connect multiple computers on the Internet to communicate privately in an isolate space. It's like creating a private network within a public network (the Internet). Hence its name: **Virtual Private Network (VPN)**. However, this technology is used a bit differently. You might have heard this term in relation to strategies to make your Internet connexion more secure or hide your real location. Some websites won't let users see specific content because of their location. Technically, a visitor's location can be determined based on their IP address. When using a VPN, your IP address can be in a country different from your real country because it's the location of the VPN that counts. The VPN is nothing but a server and you need to configure your computer (or phone) to connect to this server. Then, all your Internet traffic passes though this server before reaching the end destination. So the end destination, the website, will only see the VPN’s IP, not your personal IP.

The VPN is like a tunnel: everything you receive and send to the Internet passes through this tunnel. As explained when when talked about HTTPS, the data inside the tunnel are invisible from the outside. Your Internet provider doesn't know what you are doing. It can only guess the amount of data but not the destination nor the content. It's the most complete solution to protect your privacy. But remember it's complementary to everything we’ve explored until now: your cookies and your browser are still the same; the services you are using will still store your data. VPN is especially useful in hostile environments. For

example, you want to use a VPN when you don't want your Internet provider to know which websites you are visiting, when you're visiting them, how often, etc. It will also protect you when you use a public WiFi hotspot. No one will be able to decrypt your Internet traffic. Well, technically, it's possible to decrypt it but it would require an enormous quantity of servers and only few governmental organisations will be able to do it in a reasonable amount of time. In short, unless you are targeted by the FBI, you're safe with a VPN.

Just search "best VPN" and take the one that seems the simplest to use. Most of them will cost somewhere between $2 and $10 per month. It's worth the investment. However, bear in mind VPN providers are legally required **to keep logs** (check the chapter on logs) of some of their users' activity. So, if you are under investigation for any reason, it's possible your VPN provider will have to disclose the list of websites you've visited in the past. Not the content you've sent, just the names of websites you've looked at and how frequently you've visited them.

Data will always grow

Going over such overly complex topics in such a short amount of time is like trying to know a city just by doing a city tour. You can understand the outside and the main infrastructure. You can even grasp the history that's brought us to where we are today. I'm aware of the fact we haven't covered everything. At this point it's more than reasonable if you have some questions about specific topics. After this quick overview, I hope you are better equipped to find what you're looking for.

We have mostly focused on smart phones because it's the easiest way to explain the explosion of data gathering through something that

has become a staple of everyday life. However, you can use your imagination and forecast what it could be like with smartwatches or any new connected device that comes out. These devices will only enlarge the scope of data some companies will collect. Their data-gathering philosophy will be based on the exact same principles as with smartphones. If you understand the fundamental layers of the Internet, you will understand any new technology that comes out. There will be nothing new under the sun. The biggest innovations will happen in regards to the the quantity of storage available on devices and on servers, the quality of pictures –which will progressively facilitate image recognition–, the number of sensors, the precision of A-GPS, the bandwidth speed and battery capacity. The devices themselves will also change, despite slightly. I wouldn't be surprised to see foldable phones that are thinner and smaller than the ones we have today. Regardless of their appearance, all these devices will still store data in giant data centres.

There is no sign indicating we will produce less data in the future. All the business models and current investment decisions are heading towards the same direction. All our data is collected and analysed. And we are feeding the machine. Sometimes for the better, sometimes for the worse. You can limit the impact this has on you by changing your technological habits. There is no magic pill for this. It will be painful but vital.

Convenience, Freedom, Security: choose two. (Dan Geer)

PART II

CHAPTER 1

HOW DOES YOUR BRAIN WORK

Introduction

Our brain hasn't changed a lot in the past 5000 years. Humans became the dominant specie because we developed fascinating brain mechanisms to survive and understand our environment. We are fundamentally plastic. We process what is happening around us and make quick decisions. It's important to understand some primitive aspects about our evolution. Because we haven't turned into what we are today out of the blue. We survived and evolved because we got motivational incentives to do so. Most of them are defined by specific hormones triggered by our brains at specific moments of our lives. Even though there are many cross-cultural differences, our sources of pleasure and well-being are mostly common to all humans.

In addition to motivation, we developed a unique communication system. Our vocal and written expression opened the door to the creation of communities. We stayed in tribes and we developed a culture of passing on the accumulated knowledge to the next generations. Look at the first paintings in Lascaux: we knew how to draw something realistic to educate people. What was the real motivation behind it? Love for the community? A desire to become immortal? Pure artistic creation? Probably a mix of all the above. Regardless, this form of communication persisted and many others felt inspired to do the same. That suggests we are visual super heroes. We have a mysterious way of processing images in our brains and translating them into actions. We also have a complex sensitivity to pleasures. Not everyone has the same sources of happiness. After years researching the human brain,

some things are clear and some of them are still a mystery. We just need to accept what we know for now: making new discoveries about the brain doesn't make us smarter. It just highlights the fact we are still learning how it works.

Exploring hormones

The body releases different hormones that alter our minds for a moment. They are active components that affect our behaviour and mood. In this book, we will cover what we call the "Happy Hormones". The ones playing a central role in your sense of well being. This book doesn't aim at covering this topic in a detailed manner; the only goal is for you to get a basic map of your brain. If you're interested in this issue, I deeply encourage you to search more information online to expand your knowledge of hormones. They are tricky as they are complex, because multiple factors come into play. The same dose of one of them will have different effects on different people, depending on their background, culture, childhood, and many more external factors. Psychology is not a hard science, where you mix two things and they always produce the same result. The way we experience these hormonal changes can vary a lot. See, for example, how menstruation and testosterone levels have different impact on the lives of women and men, respectively. Any hormone, not just testosterone as in the case of men, affect everybody differently.

Oxytocin

Commonly referred to as the "love hormone", oxytocin is released during specific events like a hug, a kiss, making love, or giving birth to a child. It also works among family members or any other kind of personal relationship as it helps to build emotional relationships in gener-

al. However, its primary role is reproduction, which is why nearly all vertebrates have an equivalent of oxytocin. In this sense, oxytocin helps us to bond with someone who will eventually become a partner with whom we will have and take care of a baby. When it comes to sexual relations, oxytocin is released during orgasm. If you know a better feeling than this, give me a call. But careful, because the power of oxytocin is so great, you can even become addicted to it. Nymphomania is a real addiction. Surprisingly, research has shown we also release oxytocin when we are in pain, which might explain why people sometimes enjoy it. Regardless of what triggers its release, there is one thing I want to highlight here: this hormone is only released after a conscious effort. You have to get out of your comfort zone to find a partner and reproduce. The same applies to all other forms of social interaction. The hormone is a reward to *real* work, which explains why you can't really buy it or fake it. The stronger you jump into a relationship or any other interpersonal encounter, the stronger the effect oxytocin will have on your body.

Endorphin

These are the natural painkillers. They are released after an intense body effort to mask the pain in your muscles, which have been subjected to severe stress. They grow by recovering themselves during a rest period, where tissues become stronger and bigger. The primary role of endorphins is to help us push ourselves physically in extreme conditions. It helped our ancestors to escape from predators or to run, fish, find food, or fight. We usually feel them after the effort and we have all experienced them. It's a natural self-healing technique. After a run or an intense physical exercise, these hormones will be released and they will stay in your body for hours. They produce an amazing feeling of achievement and well-being. I love this sensation. I think en-

dorphins are the best. You can become addicted to endorphins; they're good for you. Technically speaking, endorphins are neurotransmitters suppressing pain signals from your brain. They are similar to morphine and heroin. The difference is clear, though: when you exercise consciously you receive a reward in the form of an endorphin release; in contrast, morphine is a pain medication that is administered to the body through a single dose that triggers the well-being sensation. Endorphins generally produce euphoric highs. They are also present during sex. *Whoop, whoop*!. We are already at two hormones present during sex. Not bad.

Serotonin

It's the easiest hormone to produce. It helps regulate mood and social behaviour, appetite and digestion, sleep, memory, sexual desire and function. Your body will release it on many occasions. Exposing yourself to sunlight, laughing, exercising or sleeping will increase your serotonin production. On the other hand, a lack of serotonin can trigger depression or anxiety. That's why we call this hormone a *happy chemical*. It is not entirely clear how it contributes to all of those activities. What is clear is the lack of serotonin certainly affects our mood. The gut produces a lot of serotonin and this is why it's linked with the regulation of appetite and even the feeling of happiness when we eat something tasty. It is important to remember the nervous system is complex and works in coordination with many variables. Serotonin alone won't do anything special. It helps other chemicals to function. But i's not that simple. It's a complex balance. So even if you injected it directly into your body or brain, it might not have the same effect as oxytocin or endorphins for example.

Dopamine

It mostly functions to help us get motivated. Any effort producing a tangible result will trigger the release of dopamine. The main reason is to help us in getting what we want. Because we are motivated after receiving dopamine, we will continue doing activities that trigger its release. The anticipation of a joyful event will also increase the dopamine production. It's the hormone of pleasure and it regulates our "effort/reward" mechanism. You can experiment its effect when you hear the first song of a band for whose concert you've been waiting for hours to start. Weed smokers will also experience the release dopamine when rolling a joint as the feeling of happiness emerges in them without even having lit it up. It's the sensation of knowing you will be happy soon. Many pleasurable activities also generate dopamine: meeting new people and becoming interest in them, having sex, eating, playing video games, gambling, receiving a gift, and more. Just making a pause here to confirm sex is the best natural way of releasing all happy hormones you can think of. Awesome.

Back to dopamine. Drugs like cocaine or methamphetamine increase dopamine concentration by blocking it in a certain area of your brain. That's why it leads to the feeling of pleasure. However, this feeling is a totally artificial one because you will feel a deep sense of depression after the effects wear off. That’s when the cravings chime in, because your dopamine levels are unbalanced. The problem is, you don’t associate your lack of dopamine after a drug consumption with drugs themselves. It becomes addictive because you want to compensate this bad state of mind with more drugs. **Addiction appears by hiding the negative side effects of a repeated behaviour**. Don't get me wrong, the release of dopamine caused artificially *will* have side effects because you are putting your nervous system under strong

stress. You're also injecting highly dangerous substances into your body. Drugs might not kill you immediately but they can't do you any good unless balanced with non-artificial triggers (like running).

Unlike the other hormones, dopamine is quite easy to release and fake. Because it is reward-dependent. Creating fake rewards is becoming the norm in our society. Consuming more goods to become an ideal image of ourselves is probably the biggest one. Scrolling through an Instagram or Pinterest feed is like gambling at a casino. You know something good will appear at some point and you keep scrolling until it happens. *Boom!* Dopamine shot. Scroll again and… *Bam!* Another dopamine shot because you've just found a beautiful pair of shoes that fit perfectly with the pants you bought yesterday. Notifications also produce dopamine. The sound and vibration of your phone will tell your brain "Something new is happening, there is probably someone you like telling you something awesome. That means you are an interesting person, you should pick up your phone and check, right now, because you deserve it, you must know what is happening". You transform it into a reward but it will be a fake one. The only thing you did to receive these dopamine shots is posting a new picture online. Basically, this is not an important event in your life at all nor will it have a big impact on your future. But somehow you link it to happiness. It's so easy to fall into social media addiction because no efforts are needed to get a new shot of dope. Social media work exactly as drugs. The only difference is the fact this kind of shot is socially accepted and it doesn't have a visible impact on your daily life.

Re-defining addiction

An addiction can be described as any repeated behaviour that has negative side effects on your life. Let's define what life refers to.

Human activities revolve around communication and motivation. We grow up in a world with people around us and we learn from our environment. More specifically, between the ages of 0 to 7 years old: you absorb content. At that age, your body is still creating the foundations for your hormonal system and you're shaping your perception of the world through your senses. Doctor Bruce Lipton deserves to be put in the spotlight because he dedicated his entire life to understanding the concept of Epigenetics. He's the author of "The Biology Of Belief".

Human beings are not meant to live alone. There is a fundamental biological imperative that propels you and every organism on this planet to be in a community. (Bruce Lipton)

With this in mind, one of the first symptoms of most addictions is isolation. Drugs are part of that list. The pleasure triggered by drugs releases dopamine as a way to find a shortcut to pleasure. Conversely, finding happiness through relationships, physical activities and mental activities, among others, require a lot more work. Addiction begins with a disconnection from our environment. In this sense, one way towards recovery is for drug addicts to surround themselves by people because we are naturally built to have some sort of love around us. But if a drug addict surrounds themselves with people engaging in the same or a similar activity, the idea of "this has no negative side effects" is further reinforced by their environment. Which is wrong because any shortcut damages something.

Shortcuts also suppress one of our core mechanisms: motivation. We all are motivated by something. Right here, right now. We gear our lives toward certain goals or a vision. Addiction makes sense in the context of people lacking in opportunities. When things start to get ugly, everything becomes dark around you. You don't even know why you should put an end to your addiction. At the end of the day, it might look as if there is nothing worth fighting for.

There is one thing we know for sure: addictions are not related to any substances you put into your body. As unconventional as it sounds, this is a proven fact. All drugs work the same way. Heroin is one of the most addictive drugs, and the reason behind this is not because of its chemical composition. It's mainly because of the deep sense of pleasure it triggers. Heroin users become so fragile that the drug perpetuates the feeling of plenitude it creates. This is a strong example. The same happens with weed, cocaine, LSD, and everything else. We become addicted to the sense of intense gratification drugs produce in us. Drugs may be deemed acceptable or not, depending on the culture you live in, but the effects are certainly not culture-dependent.

Relationships may also become addictive as well. The idea of losing someone may be unbearable to some people so they often cling onto that feeling until they become completely isolated. Love can be seen as a valid excuse for hiding away from society as a partner becomes the love addict's only motivation in life. But it's socially acceptable. It's politically correct. Like releasing endorphins during sport. People easily become obsessed with physical exercise to get a big release of endorphins. The difference is sport addiction barely has any negative effects. Injuries, maybe? But who cares; sport addicts are usually fully recovered after a few weeks of rest. In this sense, sports are also eas-

ier to balance with one's life. Drugs are different because they can turn someone's life upside down and they require no work to benefit from the effects. Drug addiction is certainly one of the most harmful of the addictions.

It is crucial at this point to think of smartphones as one of the causes of addiction these days because they contribute to the release of dopamine without requiring any effort from our side. Smartphones have an impact on effective human communication. They are a sweet poison for a specific reason: when we use our phones we think we are communicating with the *real* world when in reality we are only typing on a virtual messaging app. The trick is understanding how our brain works. It is especially sensitive to images and it releases the same dopamine shot that our brain releases when we are having a chat with a close friend. We are tricking our eye into thinking we are *indeed* having that chat. We are relying on our primal capacity of observation. What are the negative effects? Isolation. Even if your body is here, your mind is not. Seeing a group of people using their smartphones instead of verbally talking is the most classic example of this.

What are other side effects derived from the use of this device? Motivation goes down. As long as you keep comparing yourself to what you see online, you will continue reinforcing your addiction. If this persists, it will change the way to see the world. You will project things about life that are not real. But your brain will not be able to tell the difference because your subconscious mind will take over. You don't make a 10-second pause to evaluate what you see online. We look at an average of more than 200 pictures a day on our phones. We just don't think. This is one of the primary goals of Facebook: to push content you like to you in order to trigger the release of dopamine shots

and make you stay. So there you have an experience of joyful fantasy in front of your eyes.

If you have kids, and you care about their ability to evolve in this digital world: teach them what addiction is and help them develop their capacity to communicate and find motivation by themselves. We are losing the battle against social media and messaging apps, guys. I'm not proud of what is happening because I know I too played a role in this. Algorithms are made to create addictions. We've just done something for the very first time in history. We've found a poison that has no (known) physical negative side effects and is impossible to measure. Bravo.

Why smartphones are like dope

As long as a product triggers addiction, I would consider it to be at the same level as drugs in terms of danger. When I say danger, it's mostly about struggling to find balance and learning how to make a healthy use of it. Because, in the very essence, humans have always got used to new technologies and they have adopted and integrated them into their lives. I don't expect you or anyone else to stop using their phones forever. The same way I would never say to someone "You shouldn't drink anymore", I couldn't advise anybody against using their smartphones. What a treat! We are naturally balanced but unfortunately we sometimes lose track of what matters because we live in a century where attention is a very scarce commodity. There are so many stimuli it's almost impossible to not get distracted by something. However, truth is there are many good things about mobile phones. They are an open door to knowledge and connection. They provide the best way to promote and consume content. Missing out on all of this

would mean being isolated from an immense amount of valuable information and a vast part of the population.

At this point, I would like to highlight some characteristics that make smartphones and electronic devices highly powerful. First of all, they are socially accepted. The first step towards introducing a new product into the mainstream is to convince people to buy something new. In order to attract consumers, you need to promote your product as a tool to make them *feel* better. In this sense, the story of mobile phones is a successful one. Smartphones can now download high-quality images, videos, and stream data. They allow anyone to share content. That implies you are totally free to follow the people you like because that gets you excited. The dopamine shot you release when you feel connected to a *virtual* person has the same effect in your mind as taking drugs. Remember hormones, they don't know if the trigger is real or not. They are released regardless. Secondly, the side effects of phone addiction are often not visible. It is so hard to determine if someone is addicted or not. The lack of diagnostic methodologies makes it difficult to evaluate their impact. Phones have little impact on us everyday, but our addiction to them happens so slowly yet it becomes so deeply rooted in our brains that we never feel scared of them. They even seem comfortable and secure. When you combine an unregulated and socially accepted product with invisible side effects, you get something that is destined to stay for a long time.

This new dope is going to continue this way until it reaches a point where we profoundly question our routines. Cheating our hormonal mechanism can damage society at large if done for a long period. It is the first time in history a technology has got adopted so quickly by the global population. It had just never happened before. Even if opium had been made widely available across the planet years ago, people

would have most likely been unable to stick to it as a habit since the side effects are simply too strong. Also because most hard drugs negatively impact your body and health, they would never become broadly accepted as smartphones. This new era raises unprecedented questions. How are we going to educate ourselves and the next generations in a context where knowledge does not have any value anymore? Content is king and we can find everything on the Internet; but *actually knowing about things* has been relegated to a distant second place. I'm part of the first generation of people who's felt the impact: born in 1991, now 28 years old, and I see tons of people around me who are lost. **The famous 25-year old crisis**. I'm so grateful I never fell into this rabbit hole and found my passion early in life. Today I look around me and I'm shocked. So many adolescents are becoming adults at 25 and not at 15, like it used to be. The Web has distracted a vast portion of society. Technology has introduced more new problems and mental issues than any other thing had ever before. As we will cover in the next sections, you are defined by what you see and how you decide to look at it. We are not trained to filter content so we are overloading our vision of the future, if we have any at all. These are real effects of the new dope.

Your eye is powerful

The way you experiment the world is mainly determined by how you digest information. The first thing we use to move forward is our sight. What is confusing today is the new idea that we consume information through the eye but **we can also create a new world thanks to our vision**. We call some people "visionaries" because of their ability to *see* how the world could be like and should be like, in their opinion. To quote Wikipedia: https://the-new-dope.com/link/eye

There are seven different hieroglyphs used to represent the eye, which also has the meaning "to make or do" or "one who does". In Egyptian myth the eye was not the passive organ of sight but more ***an agent of action****, protection or wrath.*

We probably underestimate our ability to shape our lives through images. They are powerful. If you try to search into your old memories, visualising places, people's faces, objects, etc. you liked will make you comfortable. It will be harder to remember exact sentences or words unless you consciously trained yourself to remember them. Images come naturally without thinking. They are printed deeply into the sub-conscious mind. You've read it right: they leave a footprint even if you don't think they do.

Now let's take a step back and think about our society in the past 2000 years. Our brain was basically the same. Except we were not exposed to hundreds of pictures a day. We had time to process them. Drawings and paintings were the first way to see the world differently. But do you know how long it takes to create something visual from scratch? A very long time. It’s certainly not a click of a button away. So artists have always taken the time to think about what they wanted to share before starting to paint. They’ve always had a clear vision. Cognitive overload because of images hasn’t existed until recently. External influences were a virgin territory. And suddenly, in the mid-1950s, millions of people got access to television and advertising. Has our brain evolved in 70 years? Not a millimetre. The impact of screens on

society is totally new in our history. There is nothing we can learn from the past about it. It's unknown land. Because images and videos activate a core mechanism inside us. If we consume too much content without digesting it, some images will stay stuck in your minds. This will freeze your decision-making abilities. Humans need time to process information in order to make the best decisions for them and their surroundings. Removing this phase has the potential of blurring your vision. Watching so much content doesn't help you evolve. It may inspire you for a moment but will quickly escalate to confusion. We will talk about content consumption later. For now, bear in mind the eye is the first part we should re-consider in this screen-dominated world. We are totally flooded with images. And we naturally tend to believe they are all true. I expect big trauma will arise in the future as a result of the dissonance between images and reality. Also, the editing of pictures is likely to become an automated task. Image-specific algorithms are powerful enough to create a full, completely realistic picture out of some words like: a dog on a mountain during a shinny day. In 10 years, you will have a very hard time telling a real picture apart from an edited one, even from a completely digitally-made one. At the current rate of evolution in terms of hardware and software development, it's coming sooner than we think.

The best way to get ahead of the future is to learn how to digest visual content. Limiting your digital habits is crucial. It takes a lot of effort to re-connect with our true nature. We are not naturally designed to watch this avalanche of images.

Our social media era brings too much content to us. If you become what you see, and you’re watching too many things, who are you, then? You’re supposed to be building your life but you have no point of reference. Or better still: you have a thousand dots in your mind but you have no idea how to connect them. We can easily observe that

social media alone has brought 10x more images to our attention than TV. Do you think our “homo sapiens sapiens” brain has got 10x better at processing visual content in the last 10 years? Nope. Our brain evolves very slowly compared to the current technology. We just can’t process that much content. There is no way to do it unless you have a very clear idea of what your passion is and become strongly disciplined. **Breaking free from this influence will be a very valuable skill in the future**. This brain overload is **unprecedented** in the history of humanity. My question is: how are we going to face a brain disorder crisis at a massive scale?

The importance of failing

Technology is protecting us from failing. We love the feeling of comfort that the apps we use can give us. We check Google Maps every minute to make sure we are taking the fastest route. “It says I’m 11 minutes away, I want to do it in 9”. It's ridiculous. It's teaching us bad habits. We behave like this because we are somewhat afraid of failing. We've become scared to even talk to strangers to ask for directions. **We are avoiding the unpredictable**. It's important that you ask yourself the right question: Why are we so scared to be wrong? Making mistakes and getting back on track is something that is unique to human beings. We’ve evolved with this methodology because we are a sensitive emotional species. Most of our decisions come from the feeling of not being in control. Saying humans are rational is a fantasy. We react to emotions and feelings. There is no such powerful thing as getting hurt and becoming stronger after that. Our life is paved with episodes built on emotions. I'm afraid of the direction things are taking with smartphones. We don't even call people anymore; we text or email them. The human voice on the other end sounds so real. Filled with irrational fears, we freeze and gradually become too uncomfort-

able to talk to someone over the phone. We either do things by inspiration or desperation. Knowing that inspiration is in short supply these days, what about desperation? Life doesn't have to be dramatic. How about living a phone-free life in order to become more comfortable with randomness? Sometimes it's hard to explain. I'm feeling this is only what sits on the surface of this massive crash. Small crashes never hurt but technology is removing every friction from our lives. All social applications work on the same principe: attention. If they have your attention, they've got you. That's why they will do their best at **selecting the best content for you**. The rest is history. If you want to see good stuff again, you open an app and you start scrolling to get a shot of fantasy. Then you feel good. It’s a dope shot. Social media apps will barely show you unpleasant content. They want you to stay while making you believe that you are in control of your life. But you’re not, really. Remember: you become what you look at. Try to picture yourself in uncomfortable situations and smile at them. Don't let your phone blur your reality.

Failing will only make you stronger. We crave for adventure and we buy it instead of living it. I'm so curious about human dynamics 50 years ago. Because we are creating a generation of non-friction education. This is a hard reality we should fight against. Your brain is made to create new neural pathways every single day. That implies we have an internal system that makes us smarter every time we do new stuff. What about that, Mark?

We are fragile

Social media and our hyper-connected society are two big sources of dopamine shots. Close to cocaine but allowed everywhere, for everyone, at anytime. It's socially accepted. Regarding the current sta-

tus of the Internet and society, I wouldn't be surprised to see more and more advertisements mentioning "The use of social media should be balanced with real-life activity". The first wave of regulation is coming. Facebook, Apple, and other actors are helping consumers by providing time limit alerts based on application usage. Just to warn the user after a certain period of activity. Companies are totally aware it's better to prevent overdoses rather than dealing with them.

We react the same way to the same triggers. That’s what can save us. If we are aware of the problem and we know how technology can exert its influence on us, we also know what we can do: just reverse the process. Why are so many people doing and enjoying the obvious benefits of meditation? Why do so many “tech influencers” ban their own kids from using cell phones? Why are so many people waking up now? **Because our brain is fragile**.

What worries me most, the real issue here, is the fact that the vast majority of social media addicts will probably never read this book. Algorithms are aware of the threat this story poses to them so they are unlikely to push a story like this one. We live in a closed loop system. People are exposed to the same topics over and over. Only when people are allowed and encouraged to connect seemingly distant or unrelated dots is creativity possible. Unfortunately, the Internet fosters the exact opposite; so opening our eyes requires a real effort. Social media and the Internet at large are provoking the segmentation of the population and the impoverishment of our people. If you know someone that needs to open their eyes, send them some books. This one or another one. Anything that can help them understand what’s happening here, how it's happening and what’s at stake.

Hard times create strong men.
Strong men create good times.
Good times create weak men.
And, weak men create hard times.
(G. Michael Hopf)

PART II

CHAPTER 2

HOW TO CHANGE YOUR BEHAVIOUR

The impact of the Internet on our society

I'm glad you're still here because I'm totally aware about the fact some of the information in this book can be depressing. But my goal is to lead you to a better understanding of your digital environment and help you navigate through it in peace. No system is perfect and you will always generate and consume data. Going totally offline is a tricky thing and for many it might not even be an option. For now, I want to highlight some potential negative consequences the Internet might have for our society. Because they are real.

Phones are changing the way we see the world and how we react to pleasure (cf. Dopamine, remember?). We can start with a basic question: if you had the possibility to experience short-term pleasure with no direct side effects, would you take it? Yes. Why not? However, this is a trap: every shortcut has a price and if we don't pay it now we will pay double later. This is something you learn as you grow up as an adult. What do you think will happen if you don't take care of your body by eating poorly and not exercising? You will find yourself in bad shape when you reach 30. Believe it or not, I've seen many people who've woken up about this in their 30s. It's like an epiphany because they realise they are still in with a chance of living in a decent body for the next 50 years of their life. The body doesn't lie. The science behind it is simple: we can see and feel it. Losing weight as well as gaining strength or endurance are visible transformations. The amazing part is the fact that you can exercise and see positive impact on your body

after just two or three months (if you're serious about it, of course). Then, you start looking at long-term goals. Discipline becomes your ally and you begin to accept you have to pay a "small" price today (aka training) to see results in the future.

This analogy with sport can be applied to virtually any activity that will make you a better person. We all know we have to study for a long time to really learn something. Not at school exclusively; you can learn a lot by yourself. What's important here is that you understand the concept of the long-term impact that doing an activity over an extended period of time can have on your life. The benefits are higher than the costs. Also, in addition to your own personal success, most of the people around you will value the fact that you are committed to studying or exercising. In fact, most of us will not only understand it but also naturally encourage you to keep it up because it will only do you good, right?

Smartphones are a totally different story. Since we are not really sure about the long-term effects, it's difficult to set ourselves some goals. What should we measure? What constitutes a factor for success as far as the use of technology is concerned? Everybody would give a different answer to this question. What's clear, though, is the first step to getting better at something is being able to measure it. iOS recently added the possibility of restricting the use of applications, but I'm not sure people will use this functionality much. Even if you don't limit your apps, you can still see how long you spend using your phone on a daily or weekly basis. You can also see the number of pick ups (how many times you look at your phone per day). These metrics are the first you want to improve. I strongly recommend you have a look. You will be amazed at how many times you check your phone and how long you spend on apps. You will also be able to find this feature on Android, depending on your phone's manufacturer and the version of

the operating system installed on it. In any case, I'm sure you can find apps to track these metrics if you don't have this feature already on your Android phone.

Ok. Measuring the time spent on your phone is just the first step. Then you need to realise what else you can get out of your life when you reduce your screen time. This is another fundamental observation: Which are the most memorable experiences of your life? The number of likes on a trip to Bali? Getting twenty new followers after posting a new meal on Instagram? Receiving a message from a friend saying he/she really likes your new shoes? Probably not. The things you will remember the most in your life are memories and emotions that happened unexpectedly. At least, this is what old people say before dying. When you're close to the end of your life, you will remember your loved ones, the way you treated them, what you did with them. You will also remember some big accomplishments, the cities you visited and the experiences you had. None of it will be related to digital stuff. Absolutely zero per cent.

That's why I'm ready to optimise my life for surprises. I'm ready to pay the price of feeling bored sometimes. Paying the price is about accepting being different from the people around me. I'm not ashamed of looking boring to others. I'm ready to feel uncomfortable because I don't have a screen to look at, I'm ready to exercise myself as a human being because if I don't, I'll pay the price of regret later on. Every hour you spend on your phone is an hour less in your potential bucket of surprises. Try to measure it this way and you will be stunned by how much stuff you could be doing instead of scrolling infinitely on your phone. Some people already have this balance and they choose real-life interaction over online activities. I'm mostly concerned about the

next generation of humans growing up with a phone in their hands. What price will we pay for it? It's up to all of us.

Screens are a perfect shield between you and your environment. We think we are connected to others but we are not. We think we are loved but internally we feel lonely. We believe everything we see online without questioning it. The dopamine shot you receive when someone shows interest in you by liking or commenting a picture is temporary but effective.

I'm afraid we will lose social skills. Screens do affect our development as human beings. Not only do screens have this power, but also all the uber-personalised content that makes us comfortable all the time has a pervasive effect on our lives. The way this works today is so subtle. Your comfort zone is well defined by the data you generate. Facebook, Instagram, Pinterest, YouTube, etc., they all know precisely how to make you keep scrolling for hours. They remove any frictions between you and your environment. The biggest concern about removing difficulties from one's life is the risk of growing up in a comfort zone. But guess what, you will still have to face painful situations in your life, and since our mind reacts how it’s been programmed, you'd better program it well. If you never experience a bit of discomfort, you will be totally lost in challenging situations. Our evolution as humans comes from overcoming life's hurdles. We create new ways of thinking by exploring the unknown and feeling this sense of discomfort. Removing this fundamental part of us is one more step towards emptiness.

Most of the images you see online will influence you. Looking at them constantly will change the way you see the world. Yes, you’ve read that right. How can you grow and make your own decisions when everything that comes your way is new and shinny?

The impact on society is already visible. If you take a close look at the generation born between 1990 and 1995, when they are 25-30, the feel lost. They are not sure of what is good for them or for the world. At this age, lot of people start questioning their whole past. This must be a painful sensation. People don't know who they are anymore or why they've made the choices that they've made. They realise most of these choices were driven by some kind of invisible authority. The current trend is to travel the world and try to see new things, but at the same time, people never stop sharing their experiences on social media, which essentially removes all the benefits of their adventures. Adventure is about the discomfort you feel when you expose yourself to new things just as it is about the happiness that emerges when you see beautiful things. But bear in mind that the way you talk about it to others will reenforce these experiences in some way or another. Therefore, sharing pictures will suppress all the good things from it. Taking more time to find the right angle for a photo rather than spending time exploring your environment is a total non-sense. Am I saying new stuff here? No. We all crave for adventure. We all want to experience success in our life. We want it so badly. But when we can't stop thinking about our phone we are living in the dark, which means we are losing your capacity of being uncomfortable.

Notifications

Notifications are the first entry point for phone addiction. They invade our routines because they're everywhere. Every app has notifications. It was one of the first yet most powerful mechanisms introduced through smartphones in the last decade. Technically, it's not complex: when a new event happens, the server will "push" a notification to your phone to make you aware of it. The initial intention behind it was a good one. It was designed to help you look at your phone only when

something new happened. This simply removed the need of pulling your phone out of your pocket every fifteen minutes to check your emails. But it evolved in a way we couldn't imagine. Today, every application can push notifications to you if you allow them to.

The effect of notifications on your brain is powerful. It resembles that of a good piece of news and triggers the release of dopamine right away. It's so deeply connected to pleasure that we can't resist checking what's happened on our phone. There is a new phenom many people are starting to see happen: ghost vibration. You think your phone vibrated in your pocket but it was just an illusion. I am sure you have experienced something like it at least once. Our brain is wired to experience pleasure from this "surprise". Notifications are the new adventures. "Wow, something totally unexpected happened in my pocket, it's probably something super important for me. I should check and see it with my own eyes, I'll be amazed, for sure!"

Then comes the sound. If we take a step back and observe how we, as humans, react to noise and sound, it's pretty remarkable. Our sense of hearing is powerful and unique. We are barely the only species able to appreciate music and feel its rhythm. Only few animals are able to do it and there are exceptions upon exceptions. The primary intent of our hearing was protection. It helped us recognise certain types of noise and react to external events. The other major function is communication. We developed our ability to create languages and recognise voice patterns thanks to our hearing. As a child, you are naturally trained to match sounds with an emotion. The sound of your parents shouting at you because you're being mischievous will make you nervous because that's how authority sound like to you. That very sound will trigger the same emotion even when you're an adult. On the other hand, the sound of the waves crashing on the beach will relax you. Notification sounds have been very well studied, research focusing

mostly on the impact notifications have on the brain. Researchers working at Facebook, SnapChat or Instagram have come to very important conclusions regarding the impact of the sound on our brain. There is a scary presentation done at Facebook in May 2014 titled "Hacker Way: Designing the New Messenger" (when they totally rebuilt the application's interface). It's not a popular video because it's targeted to developers (only 23,244 views at the moment of writing this). You can watch it here: https://the-new-dope.com/link/sound. But it's 43 minutes long. Just go to 17:30 and listen until 18:30. This is the transcript:

"We didn't stop there with the identity of Messenger. We saw an opportunity to extend this with sounds. Most apps use the default platform sound for things like push notifications and alerts. But we explored making a custom sound: something that can be functional, very easy to hear, so you wouldn't miss a message. And also something that was fun and ***memorable*** *and* ***easy to associate with Messenger.*** *This sound is special in that it hits* ***the most sensitive*** *frequency range of human hearing: the 2000 to 5000 Hertz range."*

You read it well. You need to understand the power of these companies in the technological landscape: more than 40 million messages are sent every minute (Facebook Messenger and WhatsApp combined). Do you imagine if only 10% of them trigger a notification sound? It's about 4 million of sounds per minute, which makes 5.7 billion a day. Yep, this is a global scale phenomenon, my friend. Now let's say people read messages coming from notifications 10% of the time: it's 570 million messages opened every 24h thanks to notifications. So if Facebook improves the "action on notification" from 10% to 15%, that implies 285 million more messages opened per day than with the previous sound. Do you feel me? We are talking colossal numbers

here. Now imagine that your revenue depends on how long people spend on your app and how active they are on it. If you improve the number of messages read, you symmetrically improve the probability for people to answer these new incoming messages. So, why not hack our brain by using highly personalised custom sounds to manipulate us? This is the current state of the game: apps are fostering addiction.

Sounds are highly addictive when it comes to dopamine. They are hard to control as they tap directly into our subconscious brain. When a noise or sound is emitted, we don't have control over the emotions it generates for at least one or two seconds. Our brain simply goes into default mode and we automatically take a look at what's happening on your phone.

Now that you know a little bit more about notifications, our goal is to reduce the negative impact they have on our life. I will talk about simple strategies you need to try. There isn't a one fits all solution concerning phone activity. But for the last ten years this personal realisation has been taking shape: 95% of my notifications don't need an immediate answer. The remaining 5% are calls that are made to coordinate urgent matters or share some critical news about an event. I would be just fine if I checked my phone in the morning, during lunch, and at dinnertime. I wouldn't miss anything truly important. Having a three or four-hour delay on something is absolutely nothing. How did our grandparents live? They communicated through letters and had to wait for a week to receive news. How did we come to a situation where the only possible answer is to answer now? Not answering someone's text right away is not a sign of disrespect at all. We have to take a step back and reconsider how we want to respond to this phenomena. We put pressure on ourselves for problem that have never existed. This is pure cognitive overload.

On iOS and Android there is an interesting "Do not disturb" notification setting. You can adjust the way it works. I've configured it to allow notifications (and sounds) for all incoming calls, which I consider important or urgent events. As for the rest, silence. In my case, when I activate this option, my phone vibrates only on calls and never on a message or any kind of notification. Notifications still appear on the screen and I know I'll check my phone within the next hour or so, so I'm not worried about missing out on anything. There is a popular phrase called FOMO, which stands for Fear Of Missing Out because it is really a thing. Notifications are enforcing this feeling because "you need to know what's happening", but I don't want to get sucked into this. I try hard to be in "Do not disturb" mode 80% of the time. On occasion, I will turn it off when I'm waiting for someone's message. But honestly, I 'd rather call that person to deliver the message more effectively. It's faster, the "waiting" effect disappears and there is no dopamine release involved. You can try this first. It's a first step forward. And trust me, you will feel super uncomfortable after you've been doing it for a week or so. This will help you slowly reduce your addiction to notifications. You're not addicted to them, is that you're saying? Let's see your mood after 24h of silence, then 48h, then 72h. Once again, you're way more addicted than you think.

The alternative strategy is to carefully select the type of notifications you do want to receive and disable the sound and vibration from the rest of the apps. You would have to do this one by one. It can take long if you have a lot of apps and that's why you should reduce the number of apps in the first place. But it's worth the effort because you might strike the perfect balance between being totally in silence (Do not disturb) and getting just a few notifications a day. It's all about adjustment. Give this a crack and fine-tune it as you go. Play around with sounds, badges and banners. I have some badges (number of unseen notifica-

tions, which is displayed on an app's icon) on but without sound for Gmail, Linkedin, Facebook, Instagram, and others. This means no vibration or sound. I don't even see a temporary banner at the top of my screen when I'm doing something else. Just a number on the app's icon. I consider them not important. However, I apply a different strategy for Slack, an app I use in my company to communicate. It enables real-time communication but I use it exclusively for professional reasons. These notifications are on because I want to see them on the screen and on the app's icon (badge). But they don't trigger vibration or sound, which makes them less disturbing than a normal notification. It's a silent notification, as the screen simply turns on. Because I don't want the constant flow of messages disturbing me while I'm doing deep work. What is deep work? A task requiring intense if not absolute concentration for it to be completed. I'm not suggesting you do this for a long time, especially since we can produce a maximum of 3 hours of deep work a day. You might be at 0 hours of deep work at this very moment if your current job is not challenging or if it does not require total focus. If you work as a manager chances are you're talking with different people all day long and dealing with a lot of incoming messages. Well, I recommend you try it, too. You will find yourself in a better position to reply to people: less rush, more calm, better decisions.

The notifications era is something we didn't even see coming ten years ago. It's time to take control of it. You can still decide whether or not, or to which extent you want to be impacted by it. Before listening to the sounds others are pushing to you, listen to yourself first.

Black-and-white screens

I remember I was browsing through my iPhone's settings a few months ago when I stumbled upon something fun: colour schemes.

There is an option to change your screen to black and white mode, with shades of grey of course. When you turn this setting on, you still have access to all your applications and your phone works perfectly, but there are no colours anymore.

What a fun experiment to do! The first notable change is the difficulty to use your apps. Every icon on the home screen looks practically the same so it's often hard to find an application in the first place. When you open an app, like Instagram, you won't stay there for more than a minute or two because the content will not be as attractive anymore. The impact of colours on our brain and behaviour has been widely documented online and I strongly encourage you to learn a little bit about this by searching online: "The impact of colours" and "colour psychology". Turning on this setting will allow you to realise this by yourself. When apps become difficult to use, chances are you will use them less. Why not? In the end, the best way to reduce the production of data is to not use your phone. It's also the best way to avoid addictive behaviours. You can still have your phone with you and use it to check important emails, receive calls, text people, etc. But you won't be wasting your time scrolling down through infinite feeds of content forever. Trust me, it will positively impact the quality of your time.

Strong changes like this one aren't easy to implement. It's just a step towards digital freedom. Even if you think you control the way you use your phone, you probably do not. Think about it: you pick up your phone to check notifications all the time. But if the screen is black and white, you won't find it sexy. So, day after day, your phone will progressively become a very boring accessory. When you start thinking less about it, you will slowly break bad habits that make you use it all the time. You can only learn from this experiment and you're always free to turn the colour mode back on when you need it.

Taking pictures using a black and white screen is also fun. It feels a bit like old-school analog cameras. You don't really know how the photo will really look like. In my case, I simply decided to edit photos on my laptop, where I have a *real* screen.

People's reaction to a black-and-white screen is so hilarious: "Wow, did something happen to your phone?"; “Why are colours not displayed?”; “Is it a bug?”; "Arg! It must be so annoying to look at a black-and-white screen on such an expensive high-tech device”; "I feel you, don't worry, you will get a new one soon. I'm sure you can use your insurance to get a replacement." The answer you will get will vary depending on the person or the situation. In my case, if I know the person and I feel like talking about the topic, I will tell them I am doing it on purpose as it helps me reduce my phone usage. If I don't want to talk about it at that particular moment, I’ll just say "Yeah you're right, don't worry, it’s temporary,. I'll get it fixed."

If you want to be able to toggle on and off the black-and-white screen option on iOS go to: *Settings* > *General* > *Accessibility* > *Accessibility Shortcut*. Search for the "Colour Filters" option and click on it in order to be able to activate and deactivate it when you triple-click your iPhone’s side button. Even if this option is located somewhere else in your settings menu in the future, it's worth looking for it. I use it a lot. My phone is black and white 80% of the time. My brain is not impacted in the same way by a colour-less screen. I can feel it. The phone is becoming less and less important because it’s becoming increasingly boring to look at.

I'm convinced more and more people will start dumbing down their phones. Old school style. People will soon use their phones only to call and text, and eventually to take pictures. It will become a trend. The trend of people who want a life without illusions about the world around them.

When to avoid using your phone

Since our phone is always available, we are not really sure about the right time to use it. Without mobile phones, this question wouldn't exist. But now we should start considering whether they help us socialise better or if using them in our daily lives makes us more anti-social.

The first place where I consider my phone useless is my bedroom. If you are lucky enough to live in a place with different rooms, try to avoid using your phone in your own bedroom. Use it in the living room, kitchen or bathroom, but not where you sleep. Try to charge it outside of your bedroom and just buy an alarm clock. It's a good habit to reduce screen usage at night in general. But it's particularly important to avoid ingesting content when you are about to put yourself to sleep. Your sleep accounts for about a third of your time on Earth and how well you sleep will determine how you live the other two thirds of your life. Not everybody has the luxury of sleeping well and really recover overnight, so we might as well use it. Our primal metabolism needs to sleep physically to help muscle growth. But we also need to clear our minds at night to avoid cognitive overload. There are tons of techniques to improve your sleep and I strongly recommend that you question your habits around it. Smartphones are the primary sleep-killer for many reasons: the light of a LCD screen informs your brain that it needs to stay awake, which reduces the melatonin-production process. This hormone sends messages to your brain to start the sleep process. If you produce less melatonin, you won't have the same quality of sleep. You will feel tired but you won't be able to fall asleep. In addition to the lack of melatonin, ingesting tons of images by scrolling through Instagram, Facebook or Pinterest feeds will lead to a cognitive overload, at a time when you should be emptying your head. Like with food, there is a time to ingest and a time to digest. If you in-

gest content all the time without taking the time to digest, you will produce a cerebral diarrhoea. The hour before sleeping is super precious. Consider it one of the most effective tricks to get the best recovery overnight so you can start the next day well-rested and fresh. If you are also able to avoid tapping on your phone during the first hour after waking up, bingo! You're on the right track to level up your level of energy and your mood. The same process happens in the morning except it works the other way around: the goal is to activate your mind. That means what you do during your morning routine, can drastically improve the quality of the rest of your day. There is something more important than just your morning routine at stake: your day should be y*our* day as much as possible. Watching content from the outside will calibrate your day. Don't expect to make deep changes in your life if you're looking at your phone constantly: when you do this, you're creating a general idea of what your life "should" be like based on what you know. And want you know is made out of what you see.

Are we shifting away from the original purpose of this chapter? I don't think so. Taking control of your life is not about quitting your job, moving to Bali, or starting a crazy adventure. It's about moving the pieces of your life one by one. And the first piece you need to consider today is your phone. Start by reducing the impact it has on your life and listen to yourself.

Avoiding your phone when you're with other people is obviously the next thing we are going to talk about. It all starts with a simple notification in the middle of a discussion. Even if you're focused on the other person and you don't look at your phone, this notification will silently invade your mental state. It really is like this. It's physical. We just talked about notifications and you know how dangerous they are. You should also apply the "Do not disturb" strategy when you're surround-

ed by people. It will open new doors for you. I feel so uncomfortable when touching on this subject because while many people will just think "Yeah, this is a basic rule of politeness", others will find not touching their phone in a group situation such a boring and even difficult endeavour. We are clearly not equal. But what I see is that it's a global disease. It's not about your age, gender, culture or education. This is everywhere for everyone. How can we collectively change our state of mind? Firstly, it is together we should do it. Changing any kind of pattern in one's life will work for only 5% of the people, if done individually. So if you are to change a pattern in your own life, talk about it with your friends. Say it. Just say it in a simple way to make sure you're on the same page:

"I love that I am here with you guys today and I'm really having a good time. Sometimes we might get bored and wish to look at our phones to relax between conversations. But if we can, I would love you to avoid doing this and just look out of the window. Let yourself do nothing. Dream for a moment. I don't love you because you talk all the time. We have the right to get bored at times. Let's take our time to observe the things and the details we will never notice if we are on our phones. Let’s appreciate things we forgot about. My friends, this is honestly what I think. I understand if you want to answer your boyfriend or girlfriend because they want to know when you're going back home or some other logistic details, but avoid social apps and content. Create new content in your mind right now by looking at someone. Face your insecurities one by one. You will develop new abilities to navigate through society. As you expose yourself to new situations, your general anxiety level will drop. Just become more aware of your environment."

What if we just try this? What can go wrong? Start this experiment with people you trust and be firm when someone starts checking their phone at an inappropriate time. Just say it. You can be firm and polite at the same time. We should remind people about our human condition. Attention is so rare today. What is the first quality we enjoy in others? Attention. Full attention. Embracing your social fears by reducing your phone usage will create a new aura around you. You will become a person people will want to be close to. Naturally. You will be attracting amazing things to you by being in the moment.

I feel the urgency to talk about pictures. Because the content you watch is, in the first place, created by someone. You are creating content for others to watch as well. So you too have a responsibility about it. There are three things I consider wrong about taking too many pictures:

1) You are not in the moment. You will probably spend a lot of time not only taking pictures because you are not good at it but also editing them. Is all this time lost? The feeling resulting from the impression something makes on you when you first experience it is forever gone.

2) You are just using your visual memory, meaning after a trip you will simply show pictures about the moment to people without taking the time to actually describe your emotions. As a result, your vocabulary will become progressively more limited and you will slowly forget how to describe things with words, thus losing your sense of imagination.

3) You will project a certain image of your experiences to others. Your edited pictures will trigger a positive emotional response in

others and they might somehow live the moment with you albeit remotely. That will slowly blur the idea of connection and you will feel you are close to people you interact with online while in reality you're not. You will also become more prone to jealousy or envy.

Just think twice before taking your next picture. Understand the impact of it. Because the impact is becoming real and it's visible everywhere. There is a reason why Instagram took off. Does that mean you should never post anything and go totally offline? I did exactly that for six months and I learnt a lot in the process. I took a big step back to really appreciate things and I was surprised to see how many things I didn't know I could appreciate. I feel different after that experience. I've learnt it's all about balance.

If you're a little bit into sport, you probably saw the explosion of applications that allow you to generate statistics about your running sessions, swimming sessions, bike trips, etc. Some of them are incredibly well done and will help you track your progress over time. This in itself can be a fantastic way to motivate yourself. It's like having a personal coach in your pocket. Before talking about the long-term impact these apps might have on you, I want to remind you of something: this data is also stored somewhere and, which makes you vulnerable. Your body activity contains precious information about you. It can help companies to understand your habits so that they can target better products at you. This specific kind of data speaks volumes about your health. Combined with the movement tracking and the heart rate measured by smartwatches, sports applications are gathering a lot of passive data about you. I believe progress can happen in the context of health care thanks to machine learning and data science. It's an area where numbers and data can be used for the good. But for now it's unclear how these private companies use your statistics. That's the

fundamental reason why I don't use them today. Even if Apple claims they encrypt your Health data, all data at some point will be hacked and it's just a matter of time before it happens.

There are other challenges with smartwatches and sports applications. Sport in itself is diverse. You can play alone or collectively; you can train for endurance, speed or strength; and you may do so casually, semi-professionally, professionally, etc.. My own experience in sport is quite interesting. I started playing basketball at the age of 12 and at 14 I was playing in the French National Division, preparing for a potential career as a pro. I did a lot of high-intensity sport and I set big goals for myself. Unfortunately, after a motorcycle accident, I had to quit basketball, which is why I started coding. After several years without practicing any sport, I started training for endurance as I wanted to do run a half-marathon, which I accomplished in two months. So I've had the chance to explore sports in various ways. What I love about collective sports is the spirit of chaos. Even if you have systems and tactics to play with others, 80% of the game is intuition and communication, combined with physical abilities. Collective sports have not been impacted by technology as much as individual sports have and they will probably never be. The only evolution are E-Sports, which are created using technology, so I'm not worried about them. I actually think video games can be positive for children and adults. They teach strategy, reflection, failure, persistence, and more. When balanced, they can be good for us.

Even if you're using some kind of technology in your sporting activities, please remember the first goal of sport: moving your body to accomplish something with the help of your mind. The ultimate goal is to have the best body-mind connexion. If you allow technology to get too involved in the process, you might disconnect from your body and only

work with your mind. Sport is about playing and feeling your body. The thing I probably enjoy the most is running without my phone, without a watch, with nothing. I just love running and feeling the run. It doesn't matter for how long, how far, how hard. I decide when to stop. I decide when I feel I can push more, I try to listen to my feelings and guts. How many people are doing this? Millions, especially kids. It's ok to be a kid. It's totally fine not to get too serious in sport. The other place I feel in peace is when I play basketball in the street. No phone, no timer, nothing. It's just you meeting random people and playing together with them. The very essence and spirit of sport is, to me, what happens on the basketball court. It combines all the good things we can experience as humans. That will probably be for another book. My point here is: open your eyes to the *why*. Why should you measure everything all the time? Don't you want to be free instead of being controlled by data? It's up to you.

As a society, we have to collectively think twice when we use our phones. This means we'll have to say something unpleasant to people we love: "please turn off your phone when we are together". It's not about control, it's about getting back to who we are as humans. The addiction is real yet subtle. As of today, I'm more worried about teenagers who check their phones more than 200 times a day than about people who, despite using drugs once a week, still have a balanced life.

When to use your phone and the Internet

Phones were initially designed for calling others. Listening to the voice of someone else in real time was quite impressive back then. Even though today phones are powerful enough to solve many problems and they have ultimately become a commodity of the 21st centu-

ry, they led to an absolute revolution when they first came about. We already had telegrams and the exchange of text messages was there, too; however, the decoding process was extremely painful because the incoming signal had to be decoded into fully human-readable text. But phone calls and SMSs were a huge revolution in human communication. The time necessary to exchange information simply dropped drastically. While it took the postal system a few days to deliver a message, we can make a phone call within less than a minute. Phones also accelerated the pace of the world and immediacy became a sought-after feature. Actually, you can run a business and adjust your activity based on fresh information, which can be wonderful but also overwhelming. With the advent of the Internet, phone calls eventually gave way to emails, chats, video conferences, and everything we know today. The presence of technology is becoming increasingly pervasive in our lives. Countless times people have asked me "I have this [showing their home screen, which is full of notifications] and I don't even know where any of this is coming from. How can I remove this?". This is pure invasion. Why? Because of a lack of education. There is a big part of the population who is totally overwhelmed by the information they receive. It makes them feel absolutely powerless.

Let's get back to the phone's original purpose: calling. I strongly believe in phone calls. Calling might look invasive now but it wasn't when it was the only way to communicate (before 2008). It's an efficient way to deliver information. And it is still our favourite way of talking with the people we love. We use our phones to call our grandparents, our parents, our brothers and sisters…; we are not afraid of calling *them*. But we tend to text everyone else. What's happened? Certainly the fear of failing has something to do with all this. The fear of not knowing what to say or how to react. A phone conversation can put a lot on the line. A lot more than two hours of texting on WhatsApp, for sure. So, how did the applications market responded to this? Audio messages, which

are nothing but Walkie-talkie-like discussions. Why do you think the army adopted this? For fun? No. The main reason was soldiers had to be able to deliver clear, goal-oriented messages without being interrupted. The recipient could listen to the full thing first and then reply with another piece of information. When you're in a critical situation, the first thing you want to avoid is emotion. You need people to stay cold in order to react in the best possible way. Managing one's stress level is key in communication. So it turns out now we communicate with our peers through audio messages army style. Why? Because we want a fast way of sharing something in a non-invasive manner (asynchronously), and above everything, without the painful task of having to handle a the recipient's reaction. **We are training ourselves to avoid emotional failure**. This has strong consequences today already but things will get worse unless we realise what we are doing. Audio messages serve their function. But once again, all this activity should be balanced. What should you use your phone for? To call people, my friend. It's simple.

You will be surprised at the power that calling people more can have on your personal relationships. They may find it weird and uncomfortable at the beginning. However, I encourage you to look at the long-term impact and explain why you're calling. Creating uncomfortable situations is the best way to expand your abilities to survive and evolve in this world. Small changes here and there can lead you to awesome achievements.

Having said this, the truth is smartphones are indeed a great way of discovering content and people you couldn't reach without them. Using LinkedIn, Instagram, Twitter, Facebook, or other "social networks" can change your business and your life. Avoiding them completely is even dangerous because people will say things about you online anyway.

But try to use them on a laptop and not on your phone. Use the notification strategy we talked about before to avoid noise and anxiety. Furthermore, set restrictions on how long you will be able to navigate through these apps and avoid using them without a clear goal in mind. Scrolling without any intention will absorb time and energy you can spend elsewhere. Using your phone to share what you're doing might be a fantastic way to get noticed as an artist, a musician or a speaker. When you use it as a creator and you're disciplined, a whole new world opens up to you. As I've mentioned in the different parts of the book, I'm not against the Internet. I would never disconnect myself 100% from it nor do I expect any one to do that. We can live in this tech-dominated era in a balanced way if we learn to trust our intuition. The Internet's current business model is mostly built around e-commerce. To be able to sell things, you need to target the best possible audience. Machine learning helps in selecting the best people for a specific audience. Then, ad networks will display these ads to the best viewers. Now imagine you are trying to create a business by selling a product or a service to a niche market. Using social media with a business-oriented strategy can get you awesome results when compared to traditional advertising. The Internet opened up the door to a lot of small business by reducing the customer acquisition cost. The business model wouldn't work if people weren't buying things through ads. If people are buying stuff they like, that means the algorithms work pretty well. Even if you don't use it to buy anything, you can use the Internet to discover content you would never see if you had not been specifically targeted by those algorithms.

I want to talk a bit about this: **How can you use targeting algorithms to learn something faster?** Easy. This is something I do a lot and it's actually working pretty well. When I'm interested in a topic – let's say I want to play some blues with my guitar– I will go to YouTube

and search for "tutorial guitar blues basics". If I do this search on the browser I'm using everyday, it'll add a new topic to my "profile". Imagine I normally use YouTube to watch basketball games, discover music, or watch funny videos. My YouTube homepage will be filled with videos about these topics but now blues-specific videos will also appear on my Youtube feed. If I start searching for blues tutorials, I'm introducing another topic to the interests that Youtube knows I have. This is not a problem in itself but YouTube will always try to strike a balance by showing me "a bit of everything I usually watch" through its video recommendations. Once I realise I want to learn more about this topic I create a new browsing profile (check back the chapter Desktop browser) and I start to search from it. Because this browser is empty, it contains no historical data about me. YouTube will start gathering information about "tutorial blues basics guitar" and all the videos I will see in the browser from then on will be about this topic. That means the algorithm will gather precise information about my browsing history and will recommend me the best videos based on that data. If you learn about each topic by using a different browser, you will look to the browser as if you were a different visitor each time. I strongly recommend this strategy if you want to dig into a specific topic and get the best possible results.

Consume less content

My generation grew up in a context where Facebook was the main social media platform through which people talked with others and shared content. It was new, simple, efficient, and everybody was on Facebook at the time (around 2010). Then came the explosion of Instagram. Like most people, I had about 400 "friends" on Facebook. However, I talked with only 15 or 20 of these people, and met only 5% of them in real life regularly. The other people I'd met during confer-

ences, events, parties, etc. But only 5% were close friends. I was constantly checking my News Feed to see what my "friends" were doing. Since Facebook is very open and you can share anything, my feed was a mix of links, pictures, thoughts, selfies, holiday photos, etc. The classic boring combo. If you really look at it, there is not a single thing that was useful. None of this content mattered. My close friends would contact me directly by private direct message to share important content with me. So I eventually decided to unfollow my Facebook friends to have an empty News Feed while still keeping my Facebook account to talk with friends in private. You can read the full article about this adventure here: https://the-new-dope.com/link/facebook

Few weeks later, I was really feeling deep changes in the way I looked at the world. One of the first conclusions I came to was about how much watching content shapes you. I encourage you to read the three-part series of articles I wrote about this topic. Here are some extracts:

Extract 1:

"Most of the time you're reading the News Feed because:

1) You need to demonstrate your value by posting, commenting or sharing content. You need this " ego-booster". It feels good to see someone mentioning you in a comment or to get likes on your latest trip to Thailand.

2) You're randomly looking for information that can lead you to get closer to someone. It's pure stalking. You're not actively searching but your subconscious mind will probably focus on a particular activity because you want to know more about it.

3) It's safe and nothing will hurt you. How many times have you heard "I'm on a break so I'm reading my Facebook feed". Who wants

to be hurt during a break? It's part of your comfort zone. You're probably saying to yourself "I'm normal, people do kind of the same things I do".

4) You calibrate yourself. It's a kind way to say you want to check if some people are still doing boring stuff (aka you feel on top). And on the other hand, you want to see what "smart" people are doing/reading (aka you want to do things like them)."

Extract 2:

"We set our own psychological boundaries by watching the world around us. It's 99% in our subconscious mind. Your Facebook News Feed creates a bubble where you can position yourself in your own boundaries. Is this too dangerous? Too easy? Too stupid? Too smart? Every time we face a new situation, we calibrate our mindsets by trying to answer these questions.

What seems to happen when you remove your News Feed from your life is that your boundaries get blurry. When you experiment something new and have no comparison, you stop thinking so much. You just live. These may be bad or good experiences; your judgment is yours. It's not about what the average social norm dictates you should be doing. You should learn by yourself and answer these questions with a free mind.

I don't do crazy or stupid stuff either. I just feel I'm less influenced by the outside, though I slowly push myself further and harder. I try new things, new discussions, new interactions. I still care about the opinion of my peers but I'm less afraid of failing in front of others. I had deep arguments and rejections these past weeks but I feel they were necessary to learn more about myself."

Extract 3:

"Removing this influence has been a huge change this year. You won't feel it right after quitting Facebook; it's a long process. But will you slowly start to realise how much you've been restricting yourself and how far you are from living the life you want. I have countless examples of this. If we just take the social impact of quitting Facebook, you will feel more and more comfortable when talking to strangers in any situation, in various languages as you will stop thinking they are judging you. If you're not as perfect as in your profile picture, it's fine. They won't care. At least you're real, you accept yourself as a human being, and you are brave enough to just talk to them without expectations.

This is a big topic and I'm just scratching the surface. I hope I will get back on this later. But trust me, if you expect some real change in your life, removing Facebook from your life will have a huge effect.

The simple fact is seeing less "content" makes life more interesting. Because everything seems new again. You haven't been shown 10 articles and 30 comments about a certain topic; you just experience life on your own."

This is it. The less content you consume, the stronger you will be in new situations. If you feel you are reading content without clear intentions, then re-think the way you consume social media. As of today, Instagram, Pinterest, and Youtube might be your biggest sources of shinny content. Always balance you digital activity with human activity. As we say with alcohol: one glass of water per each glass of wine (because alcohol dehydrates you and drinking water really helps you feel

better). I would say: **an hour of real-life interaction per each hour of phone use**.

This abundance of content is new to us. It's been around for only 10 years. Just to give you a point of reference, the *Homo Heidelbergensis* (one of our ancestors) lived around 600,000 years ago yet it had a similar brain capacity to that of modern humans. 400,000 years ago we started using spears to chase animals. It took 200,000 years to understand how to throw a piece of wood efficiently. It's only 50,000 ago that humans started to create clothes from animal skin and develop hunting strategies. And we only settled down and became sedentary 10,000 years ago, which then led to the creation of villages and the development of agriculture. This is how slow we are.

Now comes an interesting phenomenon: the pace of evolution has been faster in the last few centuries than before. Because we developed new forms of communication and we started to print books. But, when it first came about, content was only reserved for a few. Now we barely have any limitations on access to knowledge. We know virtually everything about the world we live in, which is why the questions "Who we are?" and "What should we do?" have never been so important. We won't be able to find answers to these profound questions on the Internet. They need time and space to be. Why do you think we are seeing an explosion of mentors, yoga, sport, and meditation? People are feeling the pressure and resort to these techniques to have some of the weight lifted off their shoulders. However, you can handle this pressure way better if you just reduce your consumption of content.

There is also an idea that has been barely explored: Not all content is equal. "Content" is a very general term that may refer to anything on the Web. It can be a tweet, a picture, a short blog post, a long read, a book, a movie, a YouTube video, a song, anything. Each of these media has a different impact on you. Fast food-like content habits are

about seeing a thousands things but remembering only a few. In fact, there is an exercise you can do to put this to test: everyday for a week, write down (on paper) the content you remember seeing the day before. If you're true to yourself and want to learn about your habits, compare this list on paper to your browsing history and check the massive difference. And we are just talking about a 24-hour gap here. Consuming less content is about a narrower variety of content. Reading a book or even some long reads online will provide you more meaningful information than you think. Try to select what you're going to read before reading it. Like with everything else: plan in advance.

I usually read things in two steps:

1) I scan for articles or videos **I want to watch.** I basically bookmark them with GetPocket or OneTab (check their respective websites). Any bookmarking app will do the job.
2) I read them later when I think it's the best time, usually in the evening.

Why in the evening? Because I want to live the rest of the day focused on the moment and on what is important to do in my life. Content shouldn't be a priority. Avoiding your phone early in the morning is the best way to start creating powerful habits. You were living just fine without it the day before, so why should you rush to your phone to start scrolling down through social apps first thing in the morning? What do you think has changed since the last time you checked your phone? What do you expect to have changed? Why are you doing this? Unfortunately, I can share the tricks that I have helped me overcome this content addiction but I still have more questions than answers.

Experiment being offline

We've talked about how much data we are generating and how much content is going to change you; the latter will surely happen even if slowly. We've also talked about some techniques that could help in the process of taking control. But with all of this, we're just trying to solve a problem we can avoid by not using a phone at all. This all-or-nothing experiment often fails to have long-term effects because even though people have a strong motivation to try it out, they soon can't keep up with their own lives and start feeling unsafe. So it usually works for a week or two. Then, they jump back on their phones and start using them even more strongly than before. This leads to a nothing-result all the time. Nothing was learned, nothing changed in their lives, they won't even talk about it because most humans are afraid to talk about failure, and no one is wining here. The other problem is about the current state of affairs in relation to the media. They will either push you to consume more content, or criticise everything about social media without giving clear and actionable solutions or alternatives. The "just don't use them" answer is too idealistic because any social change must be implemented gradually or it won't stick. This is why I expect our habits regarding phone usage to change at a slow pace. Any change also requires some strong early adopters to inspire others to go through the same process.

You have the right to become a leader of change right now and share your habits with others. Don't be afraid because there are actually many people wiling to change but they feel alone in the process. I'm super confident and optimistic about the advent of an **Offline Revolution**. These early adopters will be seen as aliens or dangerous. Don't fall into this trap. Do whatever you think is the best for you and for the generations after you. You're not dangerous. You're not crazy.

You're trying to get back to whatever it is that makes us uniquely humans while respecting everyone around you.

There are solutions we can implement today without taking extreme actions. Through these solutions I encourage you to embrace the risk of failing without risk. The two things I will suggest are probably accessible to anyone:

Use a basic feature phone

Do you remember the Nokia 3310 era? I was there. We were able to send SMSs, phone people, and play Snake. Having Internet access on the phone wasn't even on our radar. Mobile carriers were charging a lot of money for just 50 SMSs and 1 hour of phone calls per month. These are called feature phones or dumb phones. This includes the Nokia 3310 and all the other phones that were on the market before 2008. No Internet access, no apps, just a list of contacts and the ability to send SMS and make phone calls. Here’s an idea for you: buy a phone like this one. Try hard to find one cell phone without any kind of Internet access. Avoid Android-based phones because you will be able to download apps and you fall into the trap again. Buy a really shitty phone. Black and white screen, if possible.

Now my suggestion for you is to have this phone available at home and ready to be used whenever you want. It might be for a day or two. When you're ready let your smartphone rest at home, remove the SIM card and put it into the dumb phone. Doing this requires taking some logistical steps but they’re all very easy, nothing you can't manage. When you want to have a "focus day” or be more in the present, just swap phones. I know you can turn off data on your smartphone but turning it back on is just too tempting. The best way to avoid eating junk food is not buying it in the first place. Do the same with your phone. Don't carry both your smartphone and dumb phone with you.

Why? Even if you don't have Internet access, you will still be able to call anyone in case of an emergency and anyone will be able to reach you if they want to. For this experiment to be successful, you have to talk with the people closest to you and explicitly ask them to call you on your phone number. Not through WhatsApp, Messenger or Instagram. Ask them to actually call you. Trust me, they will quickly understand.

This is something I want to experiment more on myself because this solution creates a very interesting balance. Because you can still use your smartphone at home to reply to some WhatsApp messages, check content, and do whatever else you want. You can connect to your WiFi network without having to insert your SIM card into your smartphone. Removing access to it during the full day is a totally doable solution. If you do this, you won't have any temptation. As you can see, you can change your habits slowly and it doesn't require making a big investment. A feature phone costs about $30. Don't tell me it's about the money. Some of you paid $1,000 for the device you're using right now. Myself included.

No Internet for a week

If you feel comfortable with the idea of the feature phone, the next step is going fully offline for a significant period of time. Going offline for an entire week would be a great achievement because it's long enough to feel some changes but short enough to avoid going into "Offline panic" mode. I recommended you try it during your next holidays or during a period of calm. Don't try to play too hard too soon. Life is long and you will have plenty of opportunities to try it again. Start small, with 4 days. Write down how you felt during and after this period. It's just for you. I am not going to suggest you use a specific method for this; just find one that you feel comfortable with. Focus on

what happens to your attention span and to your ideas during these offline periods. It might lead to surprising realisations. Also, try to keep track of how many discussions you have or how many different people you talk with. The whole point of this new habit is to find your way back to the intuitive social animal inside you. I am not asking you to avoid the Internet for the rest of your life or to isolate yourself. On the contrary, I am encouraging you to embark on a self-discovery journey. As with running, you won't start with a marathon. The most important condition to seeing sustainable progress is **to like what you're doing**. We get naturally better at what we like. If you're somewhat new to running, you can probably enjoy a 15-minute run and feel amazing. After a bit of practice, you could try running for 30 min and you will already have doubled your endurance in a short period of time. You need to learn to love what you're doing. It's the same process for anything. Returning to our example, your phone will appear to be less important after you've spent some time offline. You will be happy to have it back, of course, but if you get used to enjoying these offline periods, your phone won't eat you back. Simply because you will have created new patterns and you will have learnt to use it more efficiently.

I would love to see communities of people doing these experiments and talking about them. It might feel like a "step back" in terms of our evolution because as humans we tend to embrace everything new quickly. That's why we generally adopt new technologies so fast. But I believe in experiments. I believe in learning something about ourselves and by ourselves. What if it were time to step back a little?

Try something new

The eye is the direct entry point for information. The best way to learn something is to observe it, then visualise it, try it yourself, and,

finally, learn from your mistakes. But here is the trick: you need to do the full process in order to engage all your senses and really incorporate information into your system. Reading hundreds of books about surgery won't make you a doctor. Same goes for everything. Your eye is the tool you will use in the first step of a complex process. The problem comes from our extraordinary ability to observe: we think we know something only by seeing it. If you want to create new neuronal pathways, your brain needs to exercise. Seeing something is not enough to get the necessary skills to reproduce it. The people you see online doing crazy stuff have spent hours offline shaping their craft. There is no shortcut. Anyone who says otherwise is a liar. The brain is a muscle and it needs training. **The forgotten science about the brain is clear: repetition**. Your chances to evolve are exponentially bigger if you engage your full body when you do something. It sounds stupid but it's fundamental. Humans evolved by finding creative solutions to problems. We found fantastic new ways to travel and communicate during the past century. Being exposed to new things paved the way to the technological revolution that we have been experiencing during this century. We create from what we know. We merge different observations and experiences into new techniques. The Web is the quintessential achievement as far as knowledge is concerned. It actually exposes us to “everything". However, the current state of things is seriously putting the future of creativity in jeopardy. What is the problem? Shouldn't we be over creative thanks to the Web? Here’s what's happening:

1) Being exposed to a lot of content won't help you to understand it. To create new neural pathways, you need to engage your full body for a significant period of time. Humans are irrational animals driven by feelings. We are all better at what we love, by default, even if we haven't received any kind of formal education. The Internet pro-

vides content but not real emotion. Therefore, it's dangerous because we trick our mind into thinking *"Oh yes, I know about this, I've seen a documentary about it"*.

2) The Web you're seeing is not the same for everyone. We've explained all the reasons before: algorithms will select content for you. The goal is to keep you online for as long as possible so the Web will try to please you all the time. This is a big issue for evolution, because there isn't a single version of the Web, one that is for everyone. There is only **your version of the Web**. You think you can see everything but you can't. You're not exposed to a wide variety of things. You're in a bubble.

The comfort zone you live in is getting bigger everyday, one tweet at a time. Most people in our modern society, which is mostly a Western society, are craving for new adventures. We travel a lot more than the previous generations did. We have access to cheap flights, cheap accommodations, cheap communication, basically everything that can push us to try new things. But what is happening? We go back to default mode. We walk along the streets without paying attention to the present moment. We are afraid of asking for directions because we are used to using Google Maps for this. We don't want to waste time so we take the fastest route to get somewhere. We want to drink the best coffee in the best place so we compare dozens of cafés nearby using our apps. We don't fail anymore. We are creating a comfort bubble in situations where trying new things is extremely important. It's insane to me. It might be totally normal for you but I personally find it deeply shocking. All these bad habits are tapping directly into our core neural system and we will pass them onto the next generation. Do you remember the last time you were standing alone in a bar without a phone and felt comfortable? I'm sure you've never experienced it. We

can't stand being with ourselves anymore. Are you ashamed of not being busy? Of being alone? Why can't you day-dream, get lost in your thoughts and be ok with it? Does being active on our phones make us look cool? What is cool? When will our phones start to slowly disappear until they become obsolete? When will we favour human connection over technological connection? You have the answers to these questions in your very own pocket.

Here's an idea for you: even if you think you can't change, that it's too late for you, do it for your kids. Empower the next generation to break free from the influence of the Web as much as you can. Remove the iPads and all the technology from the house. Do you know what seems horrific to me? Trying to protect our kids in the morning but letting them use an iPad during the evening. Yeah it's easy and comfortable to let them play while you're doing something else. I understand that you can't dedicate them 100% of your time and that you need to breathe. But you're only creating new problems this way. Let them play in the dirt and encourage them to experiment new stuff by themselves away from the screens.

Let them dirty the walls! (Ido Portal)

You probably know how to create good habits. Actually, there is so much content about the topic. One of the basic concepts about changing habits is to replace them, not to remove them all together. You could prepare a list of books to read and have them ready whenever you’re tempted to read content on your phone. You can also buy an ebook reader like Kindle, or, even better, a tool like Remarkable. They

are totally different. E-Ink readers don't use LCD displays; therefore they don't affect your brain the same way smartphones do. Also, they are designed for reading and note taking. Nothing else. No apps. No notifications.

You can talk with your close friends and explain them you want to reduce your Internet consumption and that you prefer to have a quick chat over the phone for fifteen minutes instead of scrolling through Pinterest. All habits are hard to break and you might need help. Reach out to someone who cares about your journey to digital freedom. Moreover, trying new things is hard and requires planning. Try to avoid using your phone when you're traveling and learn how to be more present. This habit is easier to apply in new places because our brain doesn't have any familiar references, so it won't go back into default mode. You can even walk five blocks and go to a store you've never been without checking your phone and without any expectations. Just with the desire of trying new things. It's easier than you think. Going to Bali for a yoga retreat and then coming back to your life without having made any sustainable changes won't affect your spirit. Deep changes take time and practice. We are just bad at seeing long-term results in small changes. But they are real and valuable.

LAST THOUGHTS

Access to knowledge was once a privilege. Only few people could access books, art, and content. These privileged few were in charge of defining education and shaping the world. This is no longer true thanks to the Internet, which has actually reversed the process: we have a lot more knowledge yet a lot fewer humans experiences. We've gone too far in the opposite direction. We all know everything. We think we know everything but knowledge without action is just a waste of time and energy. We are so educated we we could actually benefit from knowing less. Or, better said: we would all benefit from knowing the right thing at the right time. This is our challenge today. The new Queens and Kings will have to master how to use the infinity of content correctly.

However, we are *all* responsible for the future. I'm afraid this book will just be a drop in the ocean because humans are terrible at anticipating catastrophes. Just look at how we're treating our planet, notice the effort that we are making to raise global awareness about the importance of global warning, and how we sometimes react to it. As humans, we need to be in trouble to react, and we often react when it's too late. The Internet's long-term impact is still uncertain. What's clear is that we can use it for the good or for the bad. You can choose which side to take and which one you'd rather to avoid.

This piece of content is your first attempt at educating yourself and opening up the doors to more elaborate discussions. I have more questions than answers about the future. The answers you'll get will depend on how you use the Web and your culture. The only thing I

know for sure is how the Web was built and how it works today. Every country or region will react differently to this explosion of content and connectivity. Trust me, this is just the beginning. Everything around you will be controlled by algorithms with the intention of removing human failure and creating an ideal life on this planet. However, comfort comes at a high cost as your most personal information is at risk. We don't know who is going to control that data, but at least now you know how much information you're generating and you have some tools to reduce the propagation of information.

I'm also talking to you, developer, UX designer, future developer, future digital something: you have a responsibility to this world today. Your daily work will impact thousands of minds. You may not believe it yet but you will realise what you've created 3O years from now. We accused the previous generation of destroying our planet with oil, gas and pollution, but we are doing the same with people's minds. We are creating things to solve problems we've never had. Just to sell more stuff to people. More dreams.

There was a time when looking at someone into their eyes was enough to make us feel happy and vibrant. Now we need to check every detail of everyone online. We feel compelled to validate their social profile to see if they are close to what we dream of. And because no one will ever be as perfect as their online persona, we feel disappointed. We self-create our own disappointment and fears. It's always time to reverse the process and get back the control of our lives. If you want to lead a more truthful life, one that is full of happiness and surprise I'll give you one simple advice: Unplug.

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