EVERYTHING TRANSACTION

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SHIKKO NIJLAND

Everything Transaction

About data, trust, and the unprecedented opportunities of the transactional Internet

Interactions and transactions are like breathing. We do it all the time, without thinking about it. They vary from calling and chatting to making electronic payments and logging on to social media. But what are transactions at the core of their being? This book presents an integrated perspective on the core of the buying process, two-sided markets, platforms, data, and trust. The only book about how to keep control over ongoing digitization and platformation.

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Preface: Why "Everything Transaction?"

In the late nineties, e-commerce started to conquer the world, and we were introduced into the world of digital "payments," "identity," and "data". With the continued advance of the Internet and the rapid introduction of all kinds of new, mobile technologies, we, as young professionals, were asked to dive deeper in this broader theme of "digital trust." Because we were fairly well informed about these technologies but knew very little about payments, we looked for "*the* book about payments" to get up to speed. Much to our surprise, this book turned out not to exist. Apart from a few academic articles and dissertations on payments[1, 2], there was hardly any literature on this quite fundamental economic activity. Paradoxically, entire libraries have been filled with books about money, while on payments, the only activity that gives money its value, little is known. The combination of in-depth knowledge about payment and the new technologies was scarce. People with knowledge about electronic payment had acquired most of it in the card-era of the seventies and eighties. At the same time, people with knowledge about digital media and technology got involved in all kinds of fascinating Internet initiatives, but not with payment or the even more generic concept of "trust" and "data exchange." At the time, payment simply had little sex appeal.

At the same time as we started our consultancy INNOPAY (2002), we also built up our industry expertise by regularly writing articles in journals, developing models, and annually publishing reports about innovations and market developments on online payments[3], mobile payments[4], electronic invoicing[5], and electronic identity[6]—broadly part of what we today call "fintech." Our drive was to organize our own thoughts, but at the same time to share those insights with the sector. Content-marketing *avant la lettre*, which traveled the world via the Internet. Some of these reports even made it to the onboarding programs of new employees at important financial institutions and authorities worldwide.

By now, fintech is all the rage, and various parties are working hard on innovations in the financial sector. Part of that focuses on optimizing "transactions" with new digital transaction platforms. Professional literature mainly addresses payment infrastructures[7, 8]. We are amazed at how few people recognize the essential strategic crossroads for transaction services. This is a real challenge for decision-makers, who are faced daily with technology-driven developments such as big data, artificial intelligence, augmented reality, blockchain, biometrics, and the Internet of Things. They continuously must assess the importance of those technologies and try to distinguish hype from hope, signal from noise, and what really are game-changing trends. Especially because these expensive decisions are socially relevant and touch on themes like privacy and security, and have a growing impact on entire sectors—or even societies.

Our intuition, experience, and observation tell us that the next phase of the Internet is imminent, the "transactional Internet," where digital trust will be organized in a more user-focused and decentralized fashion. This impacts all digital services we have become accustomed to, including payments, digital identity and data sharing, and the digital economy at large.

With this book, we want to help leaders navigate the digital world even better, from the perspective of "transactions" because that is about "everything."

Chiel Liezenberg, Douwe Lycklama, Shikko Nijland.

Three objectives:

Increase awareness

By describing the opportunities of the transactional Internet and what is required for it, we shed light on the long-term developments and effects of it, from the point of view of transactions.

Provide direction

We want to actively guide the manifestation of the transactional Internet, which we consider inevitable. The opportunities that this provides are unprecedented, provided we collectively ensure that the conditions are fulfilled. This requires a profound understanding of what needs to be done and what we aim to accomplish.

Share knowledge

The source for this book is the rich experience we have accumulated as fintech experts in the last twenty years, by working more than full-time on concrete innovations in payments, invoicing, identity, and data sharing.

Introduction

> "Interactions and transactions are like breathing—something you do all day, without thinking about it.

Introduction: The Shortest Story

The Motivation

This is a book about "transactions." Perhaps not a subject you read about every day, yet one that you engage in multiple times a day, and typically without realizing it—when you send someone a message, buy something in a store, book an airline ticket online, or close a professional deal, but also, for example, when opening your Twitter account. Transactions take on many forms: from local to global, from micro-transactions to megadeals; between parties that may know each other well, or not at all. Interactions and transactions are the core of our society and the engine of our economy.

You can see the Internet as the dynamic, underlying infrastructure for interactions and transactions between all kinds of parties, both persons and organizations. It is an infrastructure that is constantly evolving and, which, to a large extent, determines the way those exchanges can take shape—now and in the future. Within a few decades, the Internet evolved from an information channel into an interactive medium, gradually being geared up to handle transactions. Each development stage of the web has its own dynamic and associated market approaches. A lot has been written about the Internet as such. By now, the huge impact of digitization on our daily lives has become clear. However, it is interesting to note that the combination of the two subjects, "transaction" and "Internet," has received relatively little attention. Even more so because transactions are the driving force of the economy, and digitization has a major impact on the way transactions take place.

By looking at the Internet and digitization from the perspective of transactions, many things come together. Trust drives transactions, and within the digital domain, trust manifests itself in a completely different way compared to what we are used to in the physical world, namely, in the form of data. Because of this, data is the subject of a lot of attention these days. While on the one hand, personal data are needed to conduct a digital transaction to create trust for the ones involved, on the other hand, more and more questions are raised about the way such data is being handled. The scandals about data leaks, the inability of platforms like Facebook to handle unimaginably large amounts of data in a secure way: they all have the same cause. The Internet, as we know it, was never designed to support transactions and the required trust. The best we could do is to create huge, centralized pools of data, with all its risks. As a result, today's Internet is not a full-fledged transaction channel yet. Not only is this a huge missed opportunity for economic growth, but it also carries a serious risk because the number of transactions is about to explode. Within five years, the transaction volume will multiply six-fold due to growth in a.o. the Internet of Things, the sharing economy, and further penetration of the Internet globally. All of this will happen within today's infrastructure, which is not ready for it at all. And although organizations are working on further digital growth, at the same time, they systematically underestimate it. As a result, they take measures that optimize the existing situation, but that are insufficient to solve the more fundamental problem of trust. The latter can only be done by working together on a completely new transaction infrastructure, with entirely new business models.

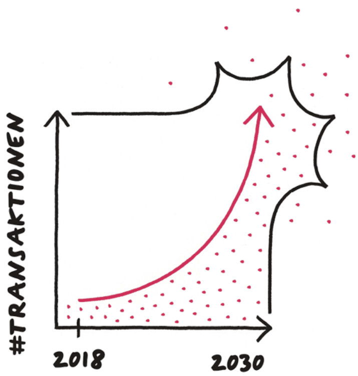


Figure 1: The number of digital transactions is about to explode

The Structure

Transactions are everywhere. They always involve two actors that exchange value quid pro quo, which is better known as the delivery and the payment, or the product and the money. But the value exchange can also take the form of data for data, such as digital services for personal information. The exchange can take place between individual persons, between the government and its citizens, or between a company and its customers. Transactions drive every business because, ultimately, only transactions put things into motion and generate turnover. But what do we really know about transactions? How can you look at transactions? How do transactions take place in an increasingly digital world? What position do middlemen take in facilitating transactions? How do you create growth and develop propositions for such a market? In this book, we analyze these questions, using the important key concepts such as interaction, transaction, buying process, two-sided markets, platforms, trust, and data.

An important common thread throughout our story is "trust" because, as mentioned earlier: there can be no transactions without trust. Digitization changes the way transactions happen, as well as the way the required trust is organized. At first, the web provided a less than ideal environment for transactions. For many people, it was a black box, increasing their experience of risk in case of digital transactions compared to transactions in the material world, simply because the transacting people are separated in time and space, as opposed to transactions in the physical world. Nevertheless, over the past few decades, the Internet developed into an important trade channel because all kinds of platforms were able to organize the required trust to enable transactions. We will show how, at present, enough trust is created remotely between buyers and sellers by eliminating risks during the buying process. A multitude of digital interactions via platforms collectively ensure that transactions can take place. Data collection by platforms play an essential role here. We will address questions like how to create the necessary trust, how to organize platforms to that end, whether to do that alone or work together with others and how to organize digital collaboration within your industry.

As mentioned earlier, transactions go beyond exchanges involving money. Exchanges on the basis of data are increasingly the norm. More and more, we can get services "for free" in exchange for our personal information. Meanwhile, service providers (often referred to as platforms) get ever more grip on our lives and society as a whole. Hailing a cab, booking an apartment, staying in touch with your friends: they are all services that are based on data and that, at the moment, are typically in the hands of one or two dominant market players. Customers become increasingly dependent on their "free" services and give up even more personal information to keep using the services. The balance of the "data benefits" keeps on tilting toward the platform owner, and we also take a good look at this particular evolution. Who owns this data, really? How can we give end users control back over the information that is about them? What do changing European regulations such as the *General Data Protection Regulation (GDPR), Payment Services Directive 2 (PSD2), and the European Data Strategy* demand from us? What opportunities does this present?

To put this to practical use, we focus on two important models related to "risk" and "trust," respectively, in a separate Design Section. Using the "Transaction Context Model," the risk perceived by actors using a new transaction method in specific contexts can be estimated. This is important, as it turns out that risk is the dominant factor in the creation of platform propositions, in addition to usability and cost. To mitigate the perceived risk, the platform proposition will also have to provide trust. The *T.R.U.S.T. Framework* provides middlemen with handles to structurally consider trust while addressing the many design choices during platform development and operations.

Of course, we also look at the future. A future in which trust is, to a lesser extent, provided by institutions such as companies and governments, but becomes embedded in the Internet infrastructure based on mathematical formulas and cosmic laws. The rise of cryptography, distributed computing, and blockchain technology, with implementations like Bitcoin and Ethereum, show that it is possible to organize trust differently, and conduct transactions without far-reaching intermediation by platforms. The announcement of Facebook's Libra in 2019[9], the fast growth of blockchain-powered Finance (DeFi and CeFi[10]), and the Web3 movement[11] in general may be other harbingers of things to come. Sure, there is still a lot to figure out, but the technology is there. What does it mean for platform providers when trust is more embedded in the infrastructure? How does this affect the relationship with customers? Will it be easier to conduct transactions when all parties are able to share their identities and data digitally? And when can everyone involved, mutually rely on this when we are in the next phase of the Internet, in which it is a mature transaction infrastructure?

In the meantime, this promising next phase of the Internet, the “transactional Internet,” is on its way. When it arrives, it will no longer be relevant whether a transaction takes place in the material world or in the digital domain. Both contexts will be equally secure and trusted by all parties involved. This simple fact has a huge impact, especially on the dominant position of today’s platform players, since much of the efforts large platforms have made to organize trust (for their users) will become less obvious. All parties using the Internet will be able to conduct transactions in much simpler, more direct, and cheaper ways. Trust as fuel for transactions will be plentiful, which will drive the number of transactions up as well as the economy as a whole.

In the short term, the phase of the transactional Internet will start with a spectacular growth in the number of digital transactions. You may wonder where that growth will come from. Will we suddenly start buying more than we are buying now? It is true that the growth will not come from those who are already digitally active; their digital transactions have, in most cases, already moved from other infrastructures to the Internet. And transactions are no longer paid with cash, but with digital money. So, what will drive the spectacular growth in the number of transactions that we expect? We see four main drivers.

First of all, vast new groups of actors will come online, both consumers and businesses. This, on its own, will provide a strong boost to the number of transactions. Think of the enormous increase in Internet usage in Asia. In years to come, in countries like China and India, some 1.2 billion people and organizations will gain access to the Internet[12], not to mention the growth coming from Africa. They will then start to engage in social and economic activities. In this case, the digital transformation is accompanied by spectacular figures simply because of the sheer size of the populations involved.

1.2 billion new users and organizations will use the Internet for their daily interactions, in the coming years.

Secondly, the number of transactions will increase because more and more *peer-to-peer* exchanges in the *sharing economy* are facilitated digitally. Transactions that used to take place in the interpersonal, non-digital domain. However, the digital alternative offers convenience, making it easier to conduct these kinds of transactions online, even when the numbers involved are only small.

The third driver is the so-called *Internet of Things (IoT).* An increasing number of physical products and machines gets connected to the Internet, bringing an entirely new group of actors online. Think of huge numbers of cars, microwaves, fridges, lamps, and doorbells, but also of industrial and logistical machines. In theory, all those "things" can conduct transactions with other actors. Obviously, that will provide an enormous boost to the number of transactions.

While the factors mentioned above, in themselves, generate growth in the number of trade transactions, the fourth factor is the *multiplier* created by the many data transactions underlying each transaction. These are all separate transactions that collectively generate trust between the parties involved, which, as mentioned earlier, is a condition for any transaction. In this book, we take a particularly close look at this last category of transactions. Just think about the amount of data being exchanged in the buying process before you can actually book and pay for that trip. It is these kinds of transactions that generate the truly spectacular increase. But the current Internet lacks this trust, making it à priori unsuitable as a transaction infrastructure. Businesses solve this problem by building data-processing platforms on top of the existing infrastructure in an attempt to compensate for its shortcomings in trust. A process in which a few American and Chinese parties have become very dominant. But this approach does not appear to be sufficient for the future. Put even more strongly: because of the sheer volume of transactions, the Internet may well collapse, with serious risks for all the parties involved.

The Call to Action

All in all, we face a huge challenge. How can we keep the exponential increase in the number of transactions in check? In essence, this would require only two things, which we call *big fixes.*

The first big fix is breaking through the *trust paradox.* This refers to the opposing needs on the part of users, to make data, and in particular personal and business information, more accessible, while at the same time improving data security, and in doing so, securing their trust in further digitization. Ongoing data scandals indicate how fragile that trust is and how easy it is for privacy concerns to grow. It is possible to solve the paradox by moving from *institutional* toward *infrastructural* trust. More and more scientists, politicians, and entrepreneurs point to the need for a "re-decentralization" of the Internet. The advent of blockchains in the past decade shows us that it is possible to move to something which can be called infrastructural trust. In the world of bitcoin, Ethereum, and Web3 as a whole, users are in control of their data. They do not "log in," but they "connect" to services. Users have the choice to use middle man (aka platforms), but it is not the only option anymore.

The second big fix is to restore the *data benefit balance*. By this, we mean that not only organizations and platforms benefit from the income generated by data, but consumers as well. At the moment, the benefits for consumers of the transaction data they help generate are far outweighed by those of their professional counterparties. Users often are "the product." The balance can be restored by giving consumers back control over "their" data. The growing discussion about the lack of transparency in what personal information is used for, highlights that there is an issue here. New regulations, such as the GDPR (General Data Protection Regulation) in the EU, are a first step in the right direction, but in part also turn the possession of a lot of data from an *asset* into a *liability* for organizations. On their part, consumers also need to become more aware of their own responsibilities, rights, and obligations in this area. Recent EU data regulation[13] also points in this direction.

Once these two fixes have been implemented, the transactional Internet has arrived. We are not yet there, however; there is still a lot to do. That is why this book is also a call to action for leaders from the business community, government, politicians, and educators to become serious about this next-generation Internet. We have a tremendous opportunity to change the digital playing field on a global scale.

BACKGROUND

The creation of the Internet in seven days

The invention of the Internet can be compared to the origin of "the economy." In both cases, people are the brains behind it, while nobody, in particular, is the explicit owner of the idea. The Internet has only been around for a few decades. What has caused this influential phenomenon to become a reality? Here are the origins of the Internet in seven crucial events.

Day 1. The transistor

It all started at Bell Labs, the centrally organized research department within AT&T, an American enterprise that at the time focused on telegraphy. At Bell Labs, the intellectual framework of digitization was developed by Claude Shannon: he cut information into the now all too familiar bits and bytes, and brought the mathematical evidence for that together. Through these bits and bytes, a recipient can reconstruct a message he has received without loss of quality.

At around the same time, John Bardeen, William Shockley, and Walter Brattain invented the transistor (as a replacement for the radio tube), for which they received the 1956 Nobel Prize for Physics. Thanks to the transistor—the fundamental building block of computers and all other kinds of electrical switches—it became possible to make non-mechanical telephone switchboards, which was the starting point for telecommunication and, soon after, computers, an essential foundation of the Internet.

Day 2. The first e-mail

The real Internet started in 1969 when the American Ministry of Defense developed ARPANET within the military research institute DARPA (Department of Defense Advanced Research Project Agency), the military predecessor of the Internet. It was a closed system, within which military personnel could communicate with each other. Two years later, programmer Ray Tomlinson sent the first e-mail between two computers of the ARPANET. Tomlinson was the first to use the @-sign in an e-mail address. These were the first seeds of a promising young plant that would quickly grow into a mighty jungle.

Day 3. Information in packages

In 1973, the American Vince Cerf, together with Bob Kahn, developed the technology that enabled computers to communicate with each other, ultimately leading to the Internet as we know it. Within DARPA, Cerf and Kahn developed the protocol for sending information from one computer to another. The Transmission Control Protocol/Internet Protocol (TCP/IP) cut information into little packages, sent those packages, and then reassembled them in the correct order. It became the backbone of the Internet. On January 1, 1983, DARPA accepted the TCP/IP protocol as the standard protocol for the communication between computers. The Internet was officially born.

Day 4. The "World Wide Web"

Next, the year 1990 turned out to be an important year. At the European Organization for Nuclear Research, CERN, in Geneva, Tim Berners-Lee developed software that enabled scientists to bundle their information, making it accessible (via URLs) to anyone who was interested. The Internet became the underlying hardware infrastructure for this project, which was called the World Wide Web.

Day 5. The first website

Developments happened in rapid succession. In 1991, the first website was launched: info.cern.ch. Another year later, Internet domain name registration started, with domain names ending in .com, .net, .org, .gov and .edu. In 1993, CERN opened the World Wide Web to everyone. Netscape Navigator, a browser designed to explore the Internet, entered the market in 1994. This was the real breakthrough, and the Internet was unleashed. In 1995, Yahoo, Amazon, and eBay were founded, and Hotmail was launched in 1996. In 1997, the Amsterdam Internet Exchange was set up to become one of the main intercontinental Internet network nodes. Among numerous other Internet companies, Google and PayPal were founded in 1998, Alibaba and Tencent one year later.

Day 6. The bubble and the new beginning

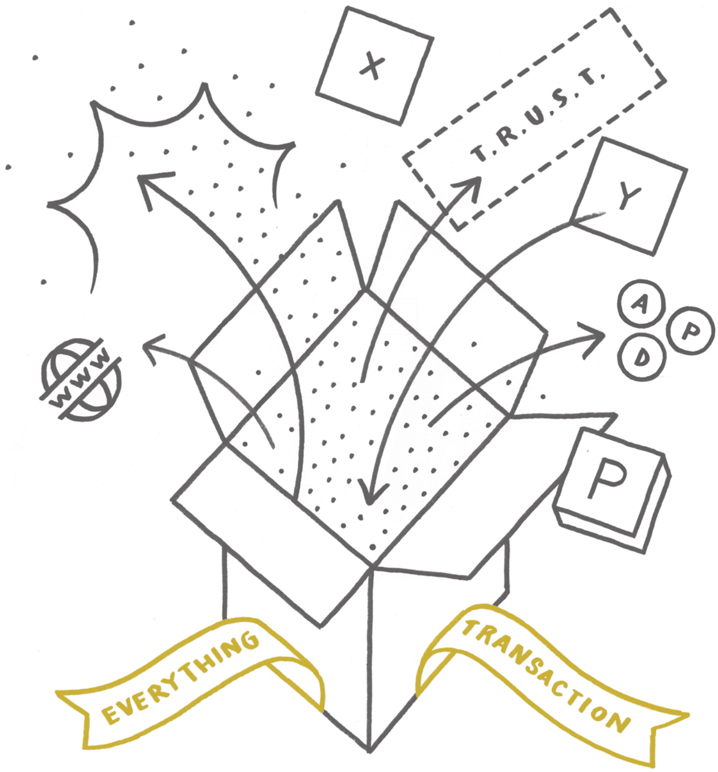
Two years later, it all collapsed. The Internet bubble grew from 1997 to the spring of 2000, after which the thousands of dotcom businesses saw their miraculous growth, fed by bizarre stock market speculation, disappear almost overnight. When the bubble burst, billions of dollars were written off. The crisis did not last long, however, because the Internet was here to stay. In 2001, Wikipedia was founded, followed by Facebook in 2004, and YouTube and Google Earth in 2005. And in 2006, Twitter was founded. All of these platforms have become household names across the planet.

Day 7. The "transactional Internet"

We have now arrived at the next phase of the Internet, in which digital transactions will be every bit as easy as those in the physical world. Carrying out a transaction will be at least as simple and secure as making a phone call. Maybe with Bitcoin and all follow-on innovation that was started in 2009. Parties will manage to find each other with ease, and trust is created effortlessly, making transactions many times cheaper, boosting the number of transactions, and allowing the economy to flourish.

Chapter One

THE PERSPECTIVE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EVERYTHING
TRANSACTION

1.1 Introduction

> **"Our knowledge about transactions and data does not appear to reflect their importance."**

Interactions and transactions are the fabric of our society and economy, yet they hardly appear to be a research topic. Books and articles about them are hard to find. This is weird, especially in a rapidly digitizing world, which strongly affects the way transactions take place, and the way the necessary trust for this is generated. In addition, digital interactions increasingly take on the characteristics of transactions, which means that the number of transactions will explode in the years to come. Everything becomes a transaction, while the Internet as we know it is not necessarily a medium that is able to provide the trust required. So, it is about time we create a clear picture of this age-old concept and understand how it develops in the current era of ongoing digitization.

This chapter provides the foundation for the rest of the book. You will come to know everything about transactions; we will unravel the concept and examine it from every angle. We will show that, both in the case of transactions and of the related concept of interactions, there are always two actors involved, which need to trust each other enough before taking action. In addition, both types of exchange by definition involve an intermediary, which can take on different forms, as a medium, middleman, or platform.

Next, we outline how these middlemen operate with their platforms, the "digital factories" that they have at their disposal. Uniquely, they sometimes service a two-sided market, bringing together two different types of actors (for instance buyers and sellers or payers and recipients) and providing them with the right propositions and tools, enabling them to interact with each other.

To get their platforms to work, middlemen have to create enough user volume on both sides of their market, by triggering network effects. This approach differs strongly from the one in linear value chains, where parties are themselves a party in the transaction. The operators of digital platforms are anything but that: they merely facilitate transactions between their users, for which they can choose one of two basic strategic models for servicing their user groups: more exclusively as a hub, or more inclusively in collaboration with other platforms in a network.

We then zoom in on the *customer journey* and the buying process that buyers and sellers go through together, and which includes interactions and transactions. This phased process is digitizing rapidly in every imaginable market. A middleman can claim a position in this transition in different ways: as a transversal platform focusing on a specific step in every buying process, or as a longitudinal platform that concentrates a linear value chain or facilitates multiple steps in one buying process.

We also take a look at another unique characteristic of digital exchanges: the fact that they cannot take place without data *and* that they then always generate new data that can be stored and reused in future transactions. Both kinds of data represent value, which means they can serve as a new type of currency in transactions.

Finally, we position the conceptual framework in relation to the three development stages of the Internet: information, interaction, and transaction, making it clear why this book is so important, especially now.

Along the way, we will introduce you to the core concepts, which we discuss in greater detail in the next chapters. To make the perspective as clear as possible, we introduce a clarifying conceptual framework, accompanied by a visual language, making this chapter a little more theoretical and abstract. In a sense, it lets you put on 3D glasses that provide more depth to the rest of the book. We know from experience that this approach helps people really come to grips with the subject matter. To quote Dutch football legend Johan Cruijff: “You only see it when you get it.”

1.2 Transactions: What Are We Talking About?

Since time immemorial, transactions have been fundamental for our economic activity. In it, the phenomenon of "money" fascinates us to the degree that, over the centuries, tons of books have been written about it. But money is just one part of the engine that drives the economy: the transaction. The quid pro quo, with money often playing the role of quo. As payment.

> **It is the process of "paying" that gives money its meaning, and thus its value**

We already saw that transactions have failed to generate a great deal of attention in economic literature. Our knowledge about transactions in no way reflects the extent to which we constantly engage in them: day in, day out, we conduct large numbers of transactions, in a variety of different forms. And in the digital world, the number of transactions will only increase, even exponentially. That simple fact has enormous implications for all of us. So, we need to understand what we are talking about with digital transactions. Every organization has to prepare for this growth because transactions are increasingly surrounded by regulation as a result of the data being generated.

> In the digital world, the number of transactions increases exponentially, and we often don't even realize it. Every organization needs to prepare for this growth because the exchanges are more and more surrounded by regulation.

Exchanges in the digital domain increasingly take on the properties of transactions, sometimes even without people noticing. Take the smartphone, for instance. A considerable part of the contact between people and organizations nowadays takes place via mobile phones. And that is not all; we also conduct more and more transactions via this device. For instance, when one agrees with certain conditions in exchange for using a digital service. One hardly takes the time to think about something so seemingly simple. However, as soon as two parties say "yes" or

"OK" to each other, they agree to an exchange of data, which automatically means it's a transaction. Why do we know so little about transactions? What do we know? How are they structured? Who is involved? What is their origin, and how do they develop? How does the Internet influence the way we conduct transactions? First, we shed light on the essence of transactions in general. After all, understanding them is essential to understanding digital transactions, which are the main focus of this book.

Interaction and transaction

Interaction and transaction are two concepts that are related and share important characteristics. That does not mean, however, that every interaction is automatically a transaction. We start by looking at what they have in common and then examine their differences.

Always two actors, always an intermediary

In all cases, a basic condition is that two actors—people or organizations—are involved. After all, there can be no exchange if there is only one actor. If nobody listens to a speaker, there is no interaction. The same is true when someone tries to sell things that nobody wants: that will not result in a transaction. We will refer to the "role" of the two actors involved in an exchange as X and Y. Of course, in reality, there are multiple actors that take on these roles, as shown in Figure 2. In this book, we will use the simplified version on the right.

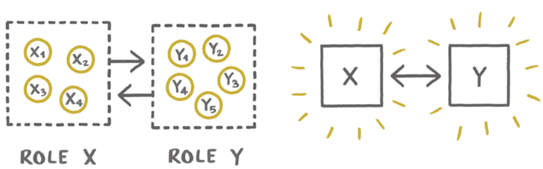


Figure 2. Interactions and transactions always take place between two actors, both playing a certain role.

A second important similarity is that both interactions and transactions are indirect in nature; there is always "something" in between making the exchange possible. From now on, we define that "something" as the role of the "intermediary." Although actors often have the perception that they interact directly, interactions and transactions by definition include an intermediary. This can be an abstract entity, like the air that allows actors to talk to each other. But it can also be more concrete, for instance, a TV station transmitting the programs of producer Y to audience X. So, the intermediary can be a medium, like paper, air, or ether, but also a person or organization, like a broadcaster.

> **Each interaction and transaction involves an intermediary that facilitates the exchange between two actors.**

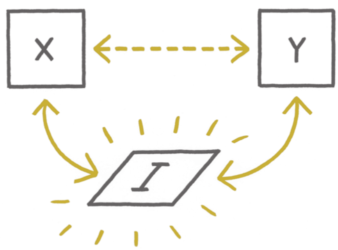


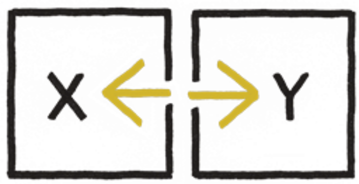
Figure 3. Interactions and transactions always go through an intermediary.

Interactions

Before taking a closer look at the concept of transactions in the next paragraph, we first elaborate on the specific characteristics of an interaction. Interactions are characterized by balance and connection; one belongs to the other. Think about sending and receiving, talking and listening, writing and reading. Interactions always involve one type of process, and the roles of the actors switch as the exchange goes on. When we talk on the phone, I talk and you listen; then you talk and I listen, and our roles are continuously alternating. That dynamic determines how the actors interact with each other. We also discuss the factors that affect the trust that is required for the exchange effectively to take place.

DEEPDIVE

Action/reaction: direct exchanges without an intermediary



The statement that both interactions and transactions always take place indirectly, so with "something in between," is an important element of the view we take in this book. We will see that the form of that "something," to a large extent, determines the course of the interaction. There is quite a difference between an interaction requiring a middleman to facilitate the interaction, and an interaction taking place independently via a medium. Does our view also allow for a direct exchange between the two actors? Without an intermediary? Yes, it does. If we go to the heart of the matter, we can say that everything in the universe is in a continuous flux of exchange. One of the basic laws that applies is that each action leads to an opposite reaction, as Newton demonstrated with his Third Law: action = -reaction. How does that work exactly?

In the case of action/reaction, the two actors impact each other directly, and there is no medium involved. There is always a balance; every action evokes a reaction. For instance, a pool ball (X) hitting another ball (Y). The course of such an interaction is completely predictable, with the action of the first ball by definition results in the opposite, equally powerful, reaction of the second ball. There is no escape.

This type of interaction is characterized by complete trust. The rules are simply not open to misinterpretation or alteration by one of the actors. They have zero choice in the matter because "action = -reaction" always maintains equilibrium. The "agreement" between the two actors involved in this type of interaction is absolute. Their "wills" are irrelevant because the process is governed by the laws of physics:

> "There is no negotiating with Mother Nature."

Both actors assume that the other actor will behave in a predictable manner, and the course of the exchange is governed above all by social conventions. When someone asks you what time it is, it is considered impolite not to answer, and it would also be weird if the response was something like "broccoli." In short, it is unusual to give an answer that does not relate to the question: certain questions demand certain answers. And certain actions normally evoke a reasonably predictable result. So, the social convention, to a large extent determines the rules of an interaction, and the two actors only have limited freedom to define those rules themselves.

In addition, the characteristics of the medium serving as intermediary affect the way the interaction takes place. Because of the specific qualities of a medium, the actors can be sure that the integrity of what is being exchanged is assured. For instance, we can assume that the paper on which a message is written will not change that message on its own.

The same is true for telephone calls. Actor X speaks into a piece of metal, plastic, and silicon and assumes that the communication technology will transfer the sound of his voice to actor Y, who listens to a piece of similar material. Both actors implicitly trust the middlemen, in this case, the telecom providers, not to alter their message along the way. The agreement is implicit because neither the actors nor the middlemen are able to alter the message with the technology being used in such a way that it would undermine the trust in the interaction. The technology in question is, after all, based on cosmic laws of physics.

There is, however, room for noise in the social part of the exchange because each of the actors has some degree of freedom to execute the interaction as they see fit. How does an actor interpret the message and how do they respond? There is some measure of unpredictability in that. Again, there is an implicit agreement between the actors, rooted in the social conventions that safeguard the trust during the course of the interaction. It is interesting to think about how the perception of the reliability of the exchange is affected when telephone calls are translated in real-time. This technology is closer than we think. Imagine actor X speaking Dutch and actor Y hearing the message in Mandarin Chinese, thanks to a digital platform translating the message in between. When technology and social conventions start overlapping in such a scenario, how do you detect a misunderstanding during the interaction? And who is responsible? In such a scenario, an implicit agreement no longer seems sufficient.

> An interaction consists of one process, within which the role of two actors continuously switches. A transaction consists of three separate sub-processes, and the actors have a fixed role throughout the entire transaction.

Transactions

The second type of exchange, the transaction, has been around for as long as there has been trade. In this case, two actors deliberately enter into a series of interactions in which they have a fixed role of either customer or supplier, with the aim of conducting an economic exchange, an exchange that consists of a quid pro quo. As with interactions, there is a balance and a connection, and there has to be mutual trust for the exchange to take place.

An important difference to an interaction is that the actors involved enter into the transaction deliberately. Consequently, an implicit agreement that is rooted in social conventions is no longer enough. In addition, the actors are free to define the terms of the agreement at their own discretion. As a result of this increased freedom for both sides, a contract is needed detailing the conditions that apply to the transaction, creating mutual trust for the transaction. Let's take a closer look at a transaction and see what happens[1]. A transaction always consists of three sub-processes: *agreement, payment,* and *delivery*; each made up of a series of interactions. We call this the *transaction trinity*. The agreement is leading. It is only after an agreement has been made that the framework is created for the other two processes: the quid and the quo, the payment and the delivery. So, unlike interactions, transactions include not just one process, but three sub-processes, with each of the actors playing an explicit, fixed role during all the process interactions that together make up a transaction.

> **The "1-2-3 of transactions": one transaction always takes place between two actors who complete three processes together.**

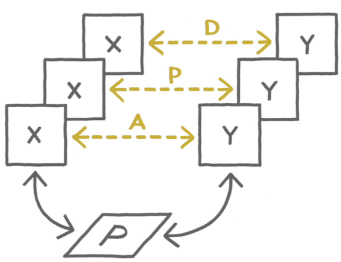


Figure 4. A transaction consists of three processes:
Agreement (A), Payment (P), and Delivery (D)

Agreement

Entering into an agreement can be an entire process in itself, consisting of a series of interactions between two actors. Both actors come to an agreement consciously and voluntarily, and they have all the room they need to organize it as they see fit. The conditions and rules for the exchange are completely open to negotiation. On the one hand, having that freedom is a good thing, but at the same time, it makes the other party's actions less predictable, while there is an economic interest at stake. So, a relatively high level of mutual trust is needed before a transaction can take place.

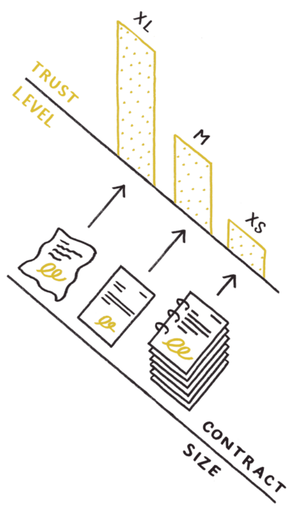


Figure 5. The size of a contract is inversely proportional to the level of trust between the actors involved.

The specific aim of the agreement sub-process is to organize this trust, which is why transactions are surrounded by regulations so as to protect the interests of both actors during and after the transaction. Conversely, both parties agree to commitments that the other party can legally enforce. So, a contract can be seen as a trust base between the actors, which has been made explicit. All kinds of specialists can be involved in drawing up and entering into an agreement, like agencies, lawyers, and notaries. This model is so powerful that even criminals can conduct transactions and commit to their own set of extrajudicial rules. And although transactions are entered into voluntarily, that does not mean they are inconsequential.

Payment

The second series of interactions within a transaction is the payment, the compensation for the delivery. The perceived risk on the part of both the buyer and the seller varies with each transaction and depends on the specific situation, the context. For instance, the buyer may run the risk that the product is not delivered or that it does not have the expected quality. That risk can be mitigated by selecting a certain payment method because every payment method has its own risk profile. As such, buyers can reduce the risk of non-delivery by selecting direct debit or credit card payment, allowing a unilateral reversal of the payment afterward. Sellers, in turn, can reduce the risk of non-payment by accepting non-reversible payment in advance methods only. Again, in this process, numerous third parties such as banks, payment services, and technology providers, and so-called fintech companies are involved. We will elaborate on this in Chapter 3.

Table 1: Interaction versus transaction

	Interaction	Transaction
Components	One process; for instance, telephone calls	Three distinct sub-processes, each consisting of a set of interactions: agreement, payment, and delivery
Roles of actors	The roles can switch (speaker, listener)	The roles are fixed throughout the course of the three sub-processes (buyer or seller)
Ensuring trust	Implicit agreement	Explicit agreement

Delivery

The third process in a transaction is the delivery. Or put more broadly: providing what the payment was for. This sub-process can again be organized in different ways. Buyers usually take products they buy in a store with them immediately, while for online purchases, the seller typically organizes that the product is delivered to the buyer. The delivery of a service, like a cab ride, flight, or dry cleaning, also falls into that category. In certain cases, the delivery takes place in a "non-tangible" form, for instance, in the case of software downloads, or video or music streaming. So, the delivery also consists of a series of interactions that are organized in a certain way, depending on the situation. And again, this can involve a wide range of professional and logistical third parties, like storage companies, transport companies, and retail organizations, as well as tech companies providing access to a digital product. All with the aim of delivering the product to the customer at the right time and at minimal cost.

In this book, we use "transaction" for a digital exchange of value. In other words, a digital transaction. This can be either an interaction or a transaction.

1.3 The Many Faces of the Intermediary

All exchanges in which the two actors involved have a certain degree of freedom are facilitated by "something in between." That means that both interactions and transactions, as we mentioned earlier, by definition, involve an intermediary. Intermediaries exist in all types and shapes. In this book, we distinguish three categories: the medium, the middleman, and the platform. Let's examine them.

Medium

Each interaction and each transaction involve a medium. This can be seen as a neutral facilitator of exchanges; for instance, air, ether, or paper. Via such mediums, all kinds of exchanges can take place between actors, with the form of the exchange to a large extent being determined by the characteristics of the medium itself. Every medium has its own possibilities and limitations. For instance, you cannot send a physical letter over the ether, and it is not possible to transfer movies on paper, only text, and pictures. A medium is always neutral and serves as a kind of basic infrastructure for exchanges. As a neutral facilitator, it is never an actor or an entity, and as such, it is never part of an interaction. It has no interest in the exchange, making it reliable by definition.

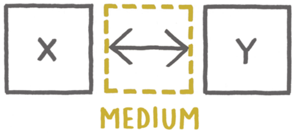


Figure 6. A medium as a neutral intermediary.

It has hardly gone unnoticed that about twenty years ago the Internet made its appearance as a new and potent medium. The Internet can be seen as a kind of "digital ether" that is accessible to everyone and which is available to actors for their exchanges. But, with its many benefits, the Internet also has important design flaws, making it not immediately suitable for transactions. One design flaw has to do with the way a message is sent from one actor to another, and another flaw is that it is relatively easy for actors in the virtual world to assume a different identity.

> The Internet still has important design flaws: the integrity of the data transfer and the authenticity of the actors are insufficiently ensured.

Let us begin with the first hurdle. For many users, digital data transmission is a non-transparent process. It starts with the fact that it is unclear when a device is connected to another party, let alone that we know what exactly is being exchanged. Despite the Internet protocol ensuring that the content of a message cannot be altered, the medium is not perfect because it is man-made. It is fairly difficult for actor X to ascertain how their digital message ends up with actor Y. Which parties are positioned in between and what are they doing exactly? Will they read the message? Are there filters in place, and how do they work? Is information being stored about the exchanges? In other words: what about the integrity of the exchange process of a message? All this makes the Internet less robust compared to, for instance, the ether.

BACKGROUND

Net neutrality

The term net neutrality was introduced in 2003 by the American professor Tim Wu and refers to the fact that all Internet traffic is treated equally. In other words, network parties, nodes, and hosting parties, in principle, are neutral with regard to the information flows that they process. The starting point is that only the end users and the service providers, the actors, are responsible for the content of the information flows. In the Netherlands, net neutrality is guaranteed by law. Unfortunately, things are starting to change, as seen among others in the United States. There, net neutrality was abolished at the end of 2017, opening up the possibility for middlemen to improve their services, for instance by favoring certain services or users[2]. Although this may increase individual people's trust in those institutions, the price for it is eroding trust in the Internet as a ubiquitous infrastructure. It is now even harder for users to determine which filters a provider is applying. It is possible, for instance, that the processing speed of exchanges is varied according to the region in which the actors are located. That does not inspire trust. Quite the contrary, once net neutrality is abolished, "discrimination" and "geopolitics" enter the Internet. This undermining of trust is a new obstacle in readying the web for transactions.

A second flaw is that, in the virtual world, actors can remain anonymous or even assume a fake identity. Their authenticity is not ensured, which creates the necessary problems on social media platforms, where some actors turn out not to be the person they pretend to be. When people enter into a transaction that involves an exchange of economic value, it is crucial for both actors to know who they are dealing with because that is the basis of the agreement. Is Mr. Jones, in fact, who he claims to be? And can Mr. Jones, in turn, be sure that the person in China selling him his knitted socks is not a fraud? Both parties will want to have certainty, otherwise, they will not act. This authentication of actors is again, something that the Internet does not provide natively. Because of these important barriers, in most cases, the implicit agreement is no longer enough for Internet-based exchanges. The rules have to be made explicit in advance before trust can even be there.

In Section 1.7, we will take a closer look at this.

The Middleman and Its Platform

Entities, on their part, can take on the role of intermediary. When this is the case, we refer to that actor as a *middleman*. In that case, a person or organization acts as a link between actors to facilitate an exchange between them. For instance, a radio station is a middleman that uses the medium of the ether to bring together content creators to listeners, while a traditional newspaper publisher that connects advertisers to readers, is a middleman using the medium of paper.

Platforms, finally, are the factories of the middlemen. They are, by definition, linked to a certain medium or infrastructure under the responsibility of a legal entity. Often, the terms middleman and platform are used interchangeably. Television companies like BBC or CNN often have their own channels that serve as platforms used to broadcast programs over the airwaves or via cable. A website like eBay has its own digital platforms that are used to facilitate interactions and transactions over the Internet. And when we talk about Uber, for instance, we can either refer to the platform for cab rides, or to the legal entity developing and operating that platform.

> To understand transactions, it helps to think in terms of "roles" instead of "parties" because a party can take on different roles.

The distinction between actor Y and a middleman, or between actor Y and a platform can be hard to establish in practice because actor Y in some cases operates their own platform to facilitate their buying process; like Amazon, for instance. In that case, actor X is dealing with the same party. It helps to think in terms of "roles" rather than "parties" or "legal entities" because it is easy to distinguish the roles, even though these can be played by a single party.

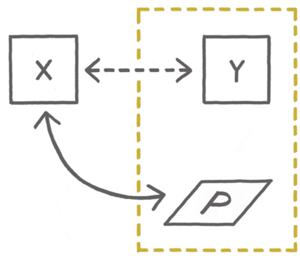


Figure 7. One party in the role of actor Y and platform P.

Thanks to the Internet, the middleman was given access to a new infrastructure, with which a platform can be created efficiently and relatively cheaply. However, we already noted that this medium is less robust than other mediums. We cannot take it for granted that the laws of physics apply online. Therefore, the middleman operating a digital platform will have to generate the necessary trust itself by setting up rules and conditions for the exchanges. It has to compensate for the lack of infrastructural trust by creating institutional trust.

> **When a middleman uses the Internet as a medium, it has to provide the required trust itself.**

Think, for instance, of a platform like Etsy, which brings together small-scale suppliers of handmade products, making it feasible for a buyer in Amsterdam to order a bag from a completely unknown supplier in Ghana, something she might have considered too big a risk if it weren't for the platform. This book focuses on the middleman that, together with its platform, serves as an intermediary for interactions and transactions. This includes the medium of the Internet as a universal basic infrastructure. We will see that it has an intimate relationship with the digital platforms that are built "on top" of it.

In this book, we use the term "platform" for the digital factories that are linked to the Internet, and which middlemen use to facilitate interactions and transactions between their users.

DEEPDIVE

Matrimony as a "transaction."

We tend to associate matrimony, or marriage, first and foremost with romance and a party. In the Western world, we have created the romantic idea that marriage is about loved ones exchanging their wedding vows. But if we are honest and strip the concept of marriage down to its core, it is above all a document with legal and economic consequences. Next to buying a house or getting a job, marriage is one of the most important transactions we can enter into in our lives. Just look at its history. In many cultures, the dowry is perhaps the most important element of matrimony. It's nice if the two newlyweds love each other, but it is certainly not necessary. An important condition for any transaction, and certainly for a marriage, is that the two parties involved trust each other enough. Trust is essential, and it is the fuel of any transaction, and the core of any matrimony. In fact, trust is even more important than love in matrimony. In our culture, when we talk about matrimony, we talk about business elements like the legal status of the relationship the partners have with each other, with their children, and with the outside world. For instance, when they are buying a house or have to pay their taxes. There is a distinction between the church wedding and the civil marriage, an agreement that you make in front of God and for the law. In both cases, there is a middleman, the church, or the civil servant. In the case of a civil marriage, we talk about all kinds of rights and duties. The civil code sets up the legal framework within which other transactions also take place. For instance, spouses owe each other loyalty, help, and support. They are obliged to provide for each other. So, there is both a moral obligation in pretty words that cannot be enforced, and an enforceable material obligation.

The civil codes in the Western world talk about enforceable things, not so much about love and romance, which makes matrimony more of an agreement with a payment and a delivery, like any other transaction. For instance, it speaks of the agreement concerning the costs of raising and caring for underage children. The laws in different countries elaborate further on that. Also, for instance, whether the loved ones got married in a community property or with a prenuptial agreement. Here, the notary is the middleman who drafts the agreement, the payment, and the delivery in further detail. Great if there is love involved, but the notary couldn't care less as long as there is mutual trust. As for any transaction.

> "Matrimony" is a nice example of the complex coherence and dynamics of a transaction.

1.4 Two-sided Markets

A middleman always serves two actors with its platform, facilitating their mutual exchange. It is up to the middleman to bring its users together with attractive propositions. From its perspective, the middle, there are always two actors that play a certain role during an interaction or transaction and have a certain need when doing so. When there are *distinct user needs* for taking on the roles on either side, we call this a *two-sided market.*

> Interactions and transactions are always asymmetrical, while propositions can be either symmetrical or asymmetrical.

Propositions

A middleman has to know exactly which problem its platform is going to solve and what user needs are going to be met. On the basis of these needs, the value of market *propositions* can be determined. These describe the bundles of products and services that create value for the target group in question. The propositions for the target groups are closely related to the core function of the platform as a whole. To enable an exchange, the two actors play a certain role. In each exchange, their roles are, by definition, asymmetrical. You toss the ball; I catch it. I call you; you are being called. I post a photo on Facebook; you see it and may respond with a smiley or a frown. So, at an interaction level, there is always two-sidedness.

The middleman bringing a platform to market will have to facilitate actors in both roles to enable an exchange between them, regardless of whether there are interactions or transactions. An important characteristic of interactions that we mentioned earlier is that the roles of the actors involved can be switched easily. Like making a phone call: sometimes you make the call; other times you receive the call. So, the needs of the two actors making phone calls are similar. If the functionality for the two roles involved can be included in a single proposition, we call that a *symmetrical proposition.* This is typically possible for interactions, and each actor is given the same functionality. That makes sense because it would be strange to have one phone to make calls and another to receive them. However, in the case of symmetrical propositions, there is no two-sidedness at the market level. To facilitate transactions, a middleman who uses the current Internet as a medium, needs more than a symmetrical proposition for both sides of the market. Each actor has distinct needs and requires functionality that is tailored to its fixed role, X or Y. In that case, that is called an *asymmetrical proposition.*

> **With asymmetrical propositions, there is always a two-sided market.**

This applies, for instance, to a platform facilitating payment transactions. In the physical world, these differences are clearly visible: the buyer has a payment card with which to make the payment, while the merchant (seller) has a payment terminal. The same goes for a platform like Google, where advertisers have access to different tools than do users searching for information. Again, both actors require their own solutions. The roles that both actors have are fixed and do not switch all the time. Both have their own specific needs and require a different proposition. This makes the propositions asymmetrical, resulting in two-sidedness at the market level.

It makes a big difference then, whether the same proposition can be used to serve both sides of the market, or whether the two actors require different propositions. The latter makes the business of the middleman much more complex and, therefore, more expensive. Providers operating in two-sided markets have to make specific choices to make their platforms function and scale optimally.

Network Effects

A well-designed digital platform has the potential to reach an enormous scale quickly and at low costs. Digital platforms that manage to do that well are able to attract entire markets in a short time. For a free telephone service like Skype, the number of users is key. It is essential to have as many users as possible. It is all about "reach." After all, every user wants to be able to call as many people as possible and be able to be called by as many people as possible. That determines the service's relevance, and each additional user increases the platform's value for all its users. We call this a *same-sided network effect*[3]. In the case of Skype, the middleman offers its market the same proposition, one that includes both roles—call and be called. Platforms that offer symmetrical propositions are able to create reach in their market quickly through network effects.

For a middleman facilitating transactions, things are more complicated. Platforms like eBay and Booking.com started off with little to no value because there were no users on either side yet. The two types of users get their own proposition from the platform. Payment markets are also characterized by their two-sidedness. The question then is: where to begin? A platform without supply does not work. But when there is no demand, that is no good either. So, it's the infamous chicken-and-egg problem. For both groups, the user volume on the *other* side of the market is what determines the value on *their* side. For instance, when many people have a Visa card, it becomes an interesting payment method for sellers. And when many stores accept Visa card payments, it becomes an interesting payment method for buyers. When growth on one side of the market generates growth on the other side, we call that *cross-sided network effects*. Scaling up a platform with asymmetrical propositions through cross-sided network effects is much tougher.

We will take a closer look at this in the next chapter.

I.5 Platforms: The Middlemen's Factories

Digital platforms like Amazon, Uber, and Airbnb appear to adopt a revolutionary, new approach with which they completely disrupt an existing market. Without a doubt, this type of platforms creates a great deal of unrest among traditional suppliers and buyers. But how new is their approach really? The phenomenon of a platform has a tradition that is comparable to that of the transaction: both have been around since time immemorial. A digital platform serving as a marketplace is based on the same principle as the ancient Roman markets that flourished about 2000 years ago. They facilitate trade in impressive quantities, while the owner of the platform, the middleman, gets paid for facilitating that process.

Earlier, we defined platforms as the middlemen's factories. The appearance of such a platform can vary from a physical flower market to Apple's App Store, but they are all based on the same core principles. An important characteristic of a platform business is that, in principle, the middleman is not a party in the exchange between the actors: it merely facilitates. That is a fundamentally different position than the positions of middlemen in a *linear value chain*. In other words: according to this definition, businesses that hold stock or assume a different risk position in the value chain are not platforms because they are actors in transactions.

An insurance agent offering insurances from multiple insurance companies to groups of consumers is a middleman operating a platform. There is no direct contact between the two parties—the insurance company and the consumer—and they meet through the agent. The agent brings supply and demand together and is not exposed to any risk as a result of the interactions taking place via its platform. According to this definition, publishers of newspapers and magazines are not platforms, because they sell their own publications via the channels they own, and they are exposed to substantial risks, especially when using the distribution channels of third parties. On the other hand, in the advertising market, their newspapers or magazines are, in fact, platforms that bring together readers and advertisers.

> Unlike middlemen in linear chains, middlemen with a platform are not a party in the transactions. They merely support them.

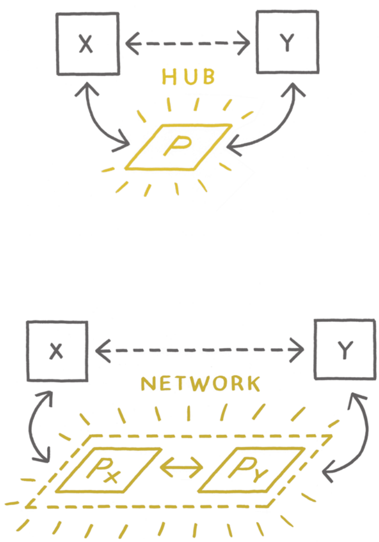
Following the arrival of digital platforms, major shifts are occurring in almost every market. While, in the physical world, many markets are organized mainly in linear chains, digitization creates a shift toward alternative structures. Shorter chains emerge where platforms manage to realize reach on both sides, bringing supply and demand together much more efficiently and allowing parties to operate more effectively.

Transversal and Longitudinal Platforms

As we will see in Chapter 3, the world is "platforming" rapidly. In all possible markets, platforms emerge, which organize trade processes in different ways, and this leads to all kinds of digital platforms. An important distinction that we want to make here is of that between longitudinal and transversal platforms. Middlemen operating a *longitudinal platform* concentrate on a previously linear value chain or facilitate multiple steps in the buying process. That means that they facilitate one or more steps within their own value chain, often with the aim of organizing as large a section of the business process as possible for their own customers. An example of a longitudinal platform is eBay, which supports the entire buying process for used goods.

Transversal platforms, on the other hand, are platforms that focus on one specific process step in every value chain, in essence, operating "perpendicular" to other platforms. The value they accumulate can be reused by other platforms. Payment platforms like MasterCard, PayPal, or iDEAL fall into this category, but so do rating platforms like Trustpilot. Essentially, once a user has registered, it can use such a payment or rating method in any platform into which it has been integrated. In addition to the payment, *transversal* payment platforms also organize the trust needed to make a transaction, by storing data about both actors. Thanks to the transversal reuse of that data across multiple platforms, the user does not have to go through an entire registration process for each purchase.

> Longitudinal platforms concentrate a value chain that was previously linear. In the case of transversal platforms, the value created can be reused by other platforms. They work across multiple value chains.



Figures 8a and 8b: The platform as a hub or as a network

Hub Model and Network Model

Here we go back to platforms, which are the factories of the middlemen. More and more middlemen use the Internet as a medium, creating what we call digital platforms. That picture is not complete, however, because the middleman can select one of two basic strategic models to design its platforms: the hub model and the network model.

When the middleman services both interacting actors itself, this is known as the *hub model*. It is an *exclusive* approach because the middleman does it all on its own. This is the first option. The operator of a shopping center uses its platform—the shopping center—to bring as many buyers and sellers as possible together. Twitter, for example, provides its digital environment to enable actors to post and read messages, while PayPal provides users with the opportunity to transfer an agreed amount from one account to another.

BACKGROUND

Ecosystem

Another term that is often used in professional literature is *ecosystem*. This is another form of collaboration in which businesses work together in all kinds of ways within a shared infrastructure. Often, the terms ecosystem, platform, and network are used interchangeably, although we draw a strict distinction. In the model presented here, we define digital ecosystems as platforms of companies that work together by offering *complementary* functionalities; unlike the network model mentioned earlier, where companies offer *identical* functionalities. An example of a digital ecosystem is the airline company KLM, which provides its customers access to Uber via its platform, allowing them to arrange for a taxi immediately after landing. In turn, Uber refers back to KLM. So, both parties offer each other's services via their platforms, both enriching their propositions and providing greater added value to their customers. In this example, passengers are not so much interested in flying from Amsterdam to Abu Dhabi, but in traveling from their home address to their hotel room. Collaborating platforms can add value by including the end-to-end journey in their proposition. In other words, they bring consecutive stages of the customer journey together and jointly facilitate them with separate platforms.

In this book, however, we focus on collaboration within networks, and we only discuss ecosystems in passing.

The second option is for multiple middlemen to work together to service both interacting actors in their specific roles, which we call the *network model*. In a network, each user group can choose between multiple middlemen or suppliers providing a fitting proposition, while the users can still interact with each other, regardless of their chosen middleman. To make that happen, middlemen have to work together in a network, making it an *inclusive* approach. A well-known example is the banking community, where account holders can transfer money from their own account to that of an account holder at a different bank without problems. Another example is telephony, where actors can call each other, regardless of which telecom provider they use. The international mail system is also organized similarly, where companies work together to facilitate the forwarding of mail across national borders, each taking care of their part of the route.

A middleman either services both actors in a hub model itself, or it works together with other middlemen in the network model.

More about this in Chapter 3.

1.6 "Customer Journey"

Both interactions and transactions are universal. They provide the basis for the way our society functions and are the foundation of our economy. In this paragraph, we place transactions within the broader buying process of which they are a part, and which all buyers and sellers go through. Because this process increasingly takes place in the digital domain, the nature of interactions and transactions also changes, with data playing a crucial role.

Transaction as the Core of the Customer Journey

Transactions are value exchanges whereby goods or services are traded against money or, in more general terms, a payment and a delivery take place based on agreed conditions. The question now is: how do two actors come to an actual transaction? It does not happen just like that but is part of a comprehensive process, in which two parties have to find each other and then decide whether or not to do business together. Literature often talks about the *customer journey*, which consists of five steps: *awareness, consideration, purchase, service,* and *loyalty*. In short, the process starts when someone becomes aware of a certain offer, which is then considered and, possibly, purchased and delivered, with a certain service. It ends with a potentially loyal customer who will make repeat purchases.

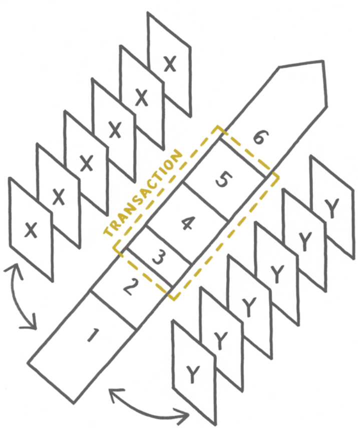


Figure 9. Multiple interactions between buyer X and seller Y during the buying process.

The steps in the customer journey are universal and independent of the situation in which the process takes place. They apply when buying a car or when booking an airplane ticket online. In all steps in the process, customer demands are leading, and it is up to the supplier to fulfill them as best it can in order to increase the likelihood that a transaction will ultimately take place and the customer is satisfied.

> **The customer journey consists of a series of interactions between buyers and sellers, with the aim of realizing an economic exchange, a transaction.**

How can the seller influence the customer journey? Each step consists of a set of interactions that serve the same sub-goal. These interactions are called customer *touch points* and can take place both in the physical and in the digital domain.

During the awareness and consideration step, it is important to be visible and easy to find for the potential buyer. The seller can accomplish this by creating as many interactions as possible. For instance, by providing information or advertising via billboards or online ads, folders, websites, or e-mails, but also by being available 24/7 via service channels. In addition, the seller can provide tools that help a potential customer to make a purchase decision, like product comparisons and reviews. It is important to then make sure that the actual transaction can be conducted easily and reliably. And finally, it is important to stay in touch with the customer after the transaction, for instance, with a helpdesk and loyalty program. Is the buyer happy with the purchase? Are there any questions about the product? If the customer is very unhappy, he will send back the product and demand a refund. The transaction is then reversed. If the customer is happy, on the other hand, the supplier can use the touch points to interest the customer in a repeat purchase.

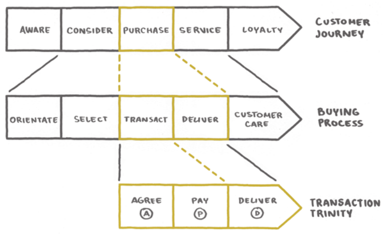


Figure 10. The relationship between customer journey, buying process, and transaction.

The *buying process* fits within the customer journey, with the steps according to the Bonsing/Mann model[4]. According to that model, the consecutive steps of the buying process are *discovery, selection, transaction, delivery,* and *customer care*. During the discovery, the buyer is actively looking for information about the products of the service, to make a preferential selection from which, in an ideal situation, a choice is made that is then purchased and delivered, with a certain customer service.

So, within the customer journey, the *agreement*, *payment,* and *delivery* steps are close to each other. These three sub-processes are inseparable and together are the *transaction trinity*. Completing them constitutes a transaction.

> Where the Bonsing/Mann model talks about a "transaction," in our terminology, that includes "agreement" and "payment." We define a transaction as the trinity of "agreement," "payment," and "delivery," which is why we add "agreement" as an explicit step to the buying process.

How does this work in practice? If the customer makes a purchasing decision, the reaching of agreement makes the supplier set the transaction in motion. In the payment step, the money is transferred to the seller, in the delivery step, the product or service is transferred to the buyer.

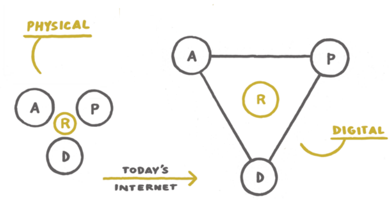


Figure 11. More “risk space” with remote transactions.

Transaction Timeline

After both the payment and the delivery have taken place, the buyer has become the owner of the product and the seller the owner of the money. In a physical situation, the transfer often takes place at the same time—a simultaneous handover. In a digital environment, however, the order of payment and delivery can swap: in some cases, payment takes place after delivery, in other cases before. With the arrival of the Internet, the number of “remote transactions” has grown tremendously. In the past, these kinds of transactions, without face-to-face contact between buyer and seller, only existed in catalog sales or mail order. It is hard to imagine, but back then, orders were hand-written on paper receipts or submitted by telephone. Although now we are accustomed to buying stuff online, such a remote transaction is typically perceived as riskier than buying something in a store. There is more “risk space.” This is a result of splitting up the transaction trinity: the buyer places an order but has to wait for delivery. The payment has already been made, and the buyer simply has to trust that the product will, at some point come into their possession. There is also additional uncertainty within each individual step of the transaction process because when the order is placed, it takes some time for the confirmation to arrive. The delivery is set in motion, but it takes some time for the product actually to arrive. The payment has been made, but can it be reversed if the product disappoints? These are all factors that increase uncertainty during a transaction in the perception of both actors.

Thanks to digitization, there are more and more remote transactions, via exchanges, spread out in time and thus increasing the perceived risk as well as the role of the middleman.

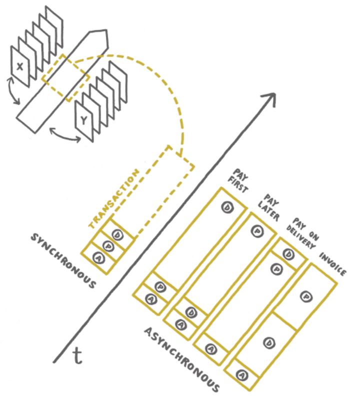


Figure 12. Synchronous versus asynchronous transactions.

To get a clearer picture of this, we introduce the term *synchronicity*: to what extent do the exchanges between the two actors take place at the same time? As we saw earlier, each interaction or transaction involves a middleman. As a result, every exchange is, by definition, indirect and will always cost—a little bit of—time.

In reality, there is no such thing as "real-time." In the case of interactions and transactions, there is always some time that elapses, no matter how little. It can be so limited that the actors have a "near real-time experience," for instance when making a phone call. This is known as a *synchronous* interaction. When the actors clearly experience time between the exchanges, it is called an *asynchronous* interaction. For instance, when sending an e-mail and having to wait a while for the response. Chat messages where there is no immediate response are also called asynchronous. Synchronicity applies to interactions as well as transactions. Figure 12 shows the difference between synchronous and asynchronous transactions.

At the top, we see a synchronous transaction, with the three transaction steps (agreement, payment, and delivery) taking place at almost the same time, in the same way we are used to in a store or at a market. You grab the product you want to buy, pay for it, and take it with you. There is a simultaneous handover, with little time between agreement, payment, and delivery. Both the buyer (X) and the seller (Y) experience an even distribution of the risk. In most cases, however, remote commerce is asynchronous; the steps are spread out in time, and even their order can vary. In the case of an online order of physical goods, the buyer might think, “Will this product be OK? Will I even get it delivered? I’d rather pay after I receive the goods. So, afterward.”

The seller might think, “Is the customer who he claims to be? Is the address correct? Will they pay? I’d prefer them to pay in advance.” So, there is more room for risk, which the actors typically experience conversely. One experiences more risk than the other. In this case, there is an important task for the middleman to remove the uncertainty that exists.

Transaction Data and Data Transactions

The way in which the exchange process is organized evolves with the times. Long ago, people would barter a cow for a pig at a market, while later, money became the common currency. With the arrival of the Internet, trade has gained tremendous momentum, with the buying process moving ever more toward the virtual domain. Each step can take place via a platform. Longitudinal when a platform supports multiple process steps in the market, or transversal when it focuses on a specific process step.

> The transaction data that result from every digital exchange have a value that can be deployed in a transaction. This is how data transactions come about.

Because of the immaterial nature of digital interactions or transactions, they instantly generate data about the exchange itself. Where in the analog world, we tend to commit messages to memory, in the digital world, everything can be recorded. If this is the case, for instance, with cookies, and those data are made usable, we call this information *transaction data*. This gives the middleman insight into the user's behavior, which it can use to influence potential buyers for its own buying process or that of others. That is why transaction data represent a value, even more so in combination with the user's personal information.

We distinguish two types of transaction data, *input data,* and *output data*. The first category makes a transaction possible; it is data *for* transactions. Think of personal information to verify the identity and authenticity of actors. The second kind could be seen as the "receipt" of the transaction. It is data *about* transactions. When transaction data is purchased by a platform, or when a user uses data as a barter agent, this makes for *data transactions*—like a user registering with a platform by providing some personal information in exchange for a high-end digital service. This may seem to be for free, but the user does actually pay—with its data. Although no traditional money changes hands, these types of "data-for-data" exchanges can be seen as transactions. And they are already taking place on a huge scale. Transaction data have proven to represent great value. Transaction data can only be used after it has been established to whom they belong—so, who owns them. As every transaction always involves two actors, the output data can never be exclusively owned by one party. Both parties are, by definition, the owners of the data of their mutual interaction. This is in itself a complicating factor, but that is not all. First, it has to be determined which parties are involved in an exchange.

> **Underlying each digital transaction, there is a data layer with its own value, of which the platform is one of the rightful claimants.**

Earlier, we stated that in a transaction, there is a payment and a delivery between actors X and Y, with the platform acting as intermediary. In the case of digital transactions, there is also a second layer underlying each transaction: the *data layer*. Here, the exchange between each actor and the platform takes place. At this level, the platform no longer has only the role of facilitator but is itself an actor in the interactions with the actors on both sides. In this way, platforms systematically acquire large amounts of data, unlike "ordinary" users. In that sense, platforms have a huge advantage compared to individual users to monetize the value of the transaction data. In addition, it can be repeated endlessly with the same data without additional costs. This *imbalance* in data benefits is increasingly perceived as unfair.

In Chapters 4 and 5, we will elaborate on this.

Case: Libra

A simple currency? Or a first and failed manifestation of the transactional Internet?

On June 18, 2019, Facebook along with twenty-seven founding members of the Libra Association announced their intention to introduce Libra —a simple global currency and financial infrastructure that would empower billions of people in 2020[1]. For those wondering if Libra is something to take seriously: within seven days Libra made it onto the agenda of the G7[2], another week later, several US congressmen sent a letter to Facebook urging them to stop Libra[3], and within a month, Facebook was called to a congressional hearing about Libra[4]. And all that just for intending to introduce a solution.

Distrust

Distrust from politicians and regulators was not mitigated by the hearings, and the political backlash was a fact. In the following fall of 2019, a first batch of founding members pulled out such as PayPal, Visa, Mastercard, and Stripe. The whole idea of Libra was overshadowed by the strongly perceived Facebook signature. After all, Facebook took the initiative. The effort to build the T.R.U.S.T. framework failed, mainly because the very basic governance was questioned by public authorities and politicians. And their support was needed because Libra would be a regulated activity.

Diem

From then onwards, the effort was focused on finding ways to make something work, diluting the original plan strongly. Along the way, the name was changed from Libra to Diem at the end of 2020, and the currency would be limited to USD instead of a basket of global currencies. The next scaling down happened when the Swiss head office was closed and all operations moved back to the US. The collaboration with Silvergate bank was mounted, a bank that has all the required licenses and experience for issuing stablecoins. Even then Diem did not get the FED approval to do their first pilot, and the whole project was dismantled at the end of 2021.

Libra was a serious attempt to realize a next version of the transactional Internet.

However, the initiative failed:

Trust

The originator was not trusted by politicians and policy makers. How good or bad the idea was, did not matter from that point.

Unified view

Governments and central banks around the world did not have a clear and unified view on this topic and its long-term implications on the financial system when such a dominant market force would play a large role. This made them hesitant to move decisively and give clarity to market parties.

. . .

Timing

Timing seems everything. As a result, governments and central banks worldwide stepped up their efforts to realize their own new infrastructure in the form of Central Bank Digital Currencies (CBDC), which can be seen as a T.R.U.S.T. payment infrastructure with a centralized governance. The transactional Internet with a wider scope (than only payments) is likely to come from Web3 initiatives.

1.7 En Route to the Transactional Internet

Although in many ways, the Internet is a hyper-efficient medium, we have pointed out a few times that it was not fit for transactions off the bat. Moreover, in this regard, there are quite a few drawbacks.

For each exchange between actors, a certain level of mutual trust is a condition. Because the digital infrastructure is not yet airtight, trust needs to be organized first. We had got to that point already. By now, the web is being used for all kinds of purposes, and the level of trust required varies for each type of exchange. When users are able to acquire free scientific reports online, they demand much less trust than when renting their houses to total strangers via a digital platform.

As such, it took a while for the Internet to become somewhat suitable for trade. Only in recent years has e-commerce become a substantial part of the economy. To illustrate that, here are a few figures: in 2016, online transactions accounted for 8% of turnover worldwide. Worldwide e-commerce sales for 2025 are estimated at 7.4 trillion US Dollar, a 400% growth compared to 2016[5, 6]. In this book, we talk about the "transactional Internet": the stage in which transactions can be conducted in the virtual domain just as easily as in the physical world. We are almost there, but not quite yet. First, a number of persistent obstacles need to be disposed of.

To put the current developments into perspective, we describe the phases that the Internet has gone through since the beginning. Each phase adds new dimensions and possibilities, making the medium more and more mature, and enabling it to facilitate more and more types of exchange.

7.4 trillion USD

Worldwide e-commerce sales for 2025 are estimated at 7.4 trillion US Dollar, a 400% growth compared to 2016.

We take a closer look at this in Chapter 5.

Phase 1: Information

During the first phase, the Internet was above all an information channel that allowed everyone to publish and read information on digital pages accessible to all. This was a major breakthrough, making an enormous amount of information and knowledge available to the greater public. It created an idealistic atmosphere, focusing above all on information equality and transparency. Until that time, knowledge had been the prerogative of a limited elite, but it had now been democratized. Anyone that wanted to do so could go online, and be informed and publish about any subject via this channel.

During this phase, the web served exclusively as a channel that was able to transfer information efficiently through a network of readers. It was mostly one-way traffic: a central broadcasting point could provide information to multiple recipients, but the recipients had no way of responding directly[7].

Organizations often launched their own websites with information in this phase, without enabling further interaction. It was little more than an online brochure or billboard. This static form of providing information was usually left to the marketing department. The website served as an additional distribution channel for existing information, through which the users could navigate themselves. For the rest of the organization, it was mostly business as usual. A typical example of the information phase is the website of a company like Philips in 1996. Basically, the floppy disk with information was put online, and that was it.

> During the information phase, Internet distribution was a one-way street, and there were only limited options for real interaction.

Phase 2: Interaction

In part due to the popularity of e-mail, the second phase of the Internet was ushered in, with interaction between various users in the network. The introduction of broadband Internet at the start of the millennium played an important role in that. Because data traffic could take place more quickly, two-way traffic became a reality. One of the most important consequences was that we could suddenly communicate with the whole world almost for free because the costs of this two-way communication were marginal. From that moment on, genuine interactivity became a possibility: an answer instantly followed a question. With a search engine like Google, one keyword would retrieve all available and relevant information. Everything was available via your personal screen at the click of a button, allowing us to approach the Internet as one single entity, rather than a collection of separate sets of information.

> **The interactive Internet was the starting signal for large-scale platforms such as Google and Amazon.**

From that moment on, communication could take place in a number of ways. The one-way street from the first phase was still an option, with a central broadcasting point providing information to one or more recipients. Broadcasters could now use new technologies, like “cookies,” to track what recipients were looking at. This interaction, however, was invisible to the recipient. Also new was that the recipients could immediately, or later, respond to information or even add something to it. In addition, they could send or forward information, to which other people could then reply. The communication could be one-on-one or take place between different groups. The traditional trade-off between reach and information richness came under pressure. While in the past, companies could decide either to reach large groups with a shallow message, like TV ads, or communicate intensively with a select group, like personal sales, it was now possible to enter into a dialog with large groups of people at relatively low costs[8]. Chatting also became available for everybody, which led to social media platforms like MySpace and later Facebook, Snapchat, Twitter, and Instagram, which have since become household names.

In this phase, many existing organizations provided a direct response option on their websites, creating an additional communication channel. This required the creation of new work processes. Companies got the opportunity of serving their customers in a more focused way, by differentiating with the content that was shown, based on variables provided by the user.

To organize trust for transactions via the interactive Internet, new middlemen were required.

Start of E-commerce

During the interactive phase, the foundations were also laid for online commerce, known today as *e-commerce.* In complete analogy to physical shopping, this includes a shopping basket and a check-out to complete the online transaction.

Organizations that used the opportunities of this phase optimally, support all stages of the buying process with interactions via the Internet. They can either do this themselves or together with other platforms that organize this for them. They ensure that their product range is presented online and is discoverable for potential customers. Options like product comparisons and reviews help them to make a selection. If an order is placed online, it is sent directly to the back office for immediate processing. The entire business process changes, from the sales department all the way through to the finance department. By now, such digital transformation has become unstoppable.

The three sub-processes making up a transaction—agreement, payment, and delivery—are also reorganized, creating new intermediary roles. A wide range of middlemen provides parts of the transaction process in digital form via a platform. As an institute, such middlemen provide the trust that is needed to enter into a transaction. Amazon, for instance, provides its own payment method. That is also institutional trust: We trust Amazon, the company. That is important because people perceive greater risk in case of online transactions where parties do not see or know each other, than they do in case of transactions that take place completely in the physical domain, for example at the local supermarket. Only when the perceived risk in the digital domain has been structurally removed, will we have entered the new phase of the Internet. How to do this using practical work models is discussed extensively in the Design Section of this book.

Phase 3: Transaction

So, the big question is: how can trust be optimally organized in the virtual domain, so that it doesn't make a difference whether a transaction takes place online or in the physical world? In other words: when will we enter the third phase of the Internet, the transaction phase? As we have mentioned a few times, the Internet was not fundamentally designed for transactions, despite the possibilities it provides. However, this limitation has not kept clever middlemen from facilitating transactions within the current interactive Internet anyway. On the contrary, they incorporate the utmost sophisticated trust mechanisms into their platforms to make this happen.

The founders of Airbnb, for instance, realized from day one that they needed to create trust between demand and supply. That was crucial to the success of their platform that was asking people to allow total strangers to stay in their homes. Airbnb solved that by including all kinds of functionalities into their platform to ensure that trust, for which they demand considerable compensation. Nevertheless, as a solution, it is not ideal, because it means that trust is now constructed in various ways within individual platforms that operate on top of the shared interactive Internet. Everything that is needed to provide the necessary trust is now put together with a kind of “digital duct tape.” Solid, and enough for now, but it is not a long-term solution. It is only when trust has been built into the DNA of the Internet itself that the new transactional Internet is created, which will affect our economic activity in a fundamental way.

> **The transactional Internet is characterized by infrastructural trust; it is embedded in the web.**

The transactional Internet is the Internet that is intrinsically suitable for transactions. The crux is that trust between actors is embedded in the web. You could call that infrastructural trust. It has become part of the basic infrastructure, without dependence on middlemen. The recent emergence of distributed computing and blockchain technology is an initial sign that there could be such a thing as infrastructural trust, and that the transactional Internet can become a reality. Facebook’s recently announced blockchain initiative Diem is a step in this direction. Trust is then ensured by technology that is based on the infallible laws of physics that apply to everyone without exception. As a principle, net neutrality nicely aligns with this, as equality is a good basis for trust.

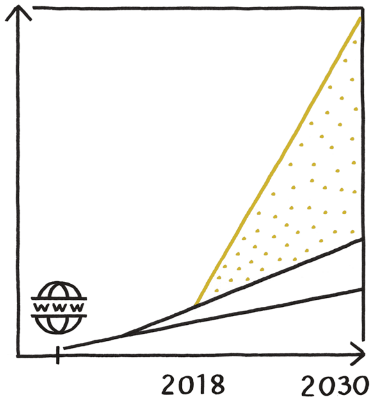


Figure 13. The transactional Internet is about to manifest itself.

What does that mean in practice? First of all, the need for institutional trust organized by middlemen will decrease by itself. We are less dependent on organizations and processes that are executed by people. In addition, when we are less bound to the trust mechanisms of large platforms, transactions will automatically become cheaper. This will lower the threshold to enter into them, and the economy—of which transactions are the engine—can really take off.

So where are we now?

At the moment, we find ourselves in the transitional phase from the interactive toward the transactional Internet. The middlemen who integrate the necessary trust mechanisms into their platforms jointly stimulate this development. The turning point is near. At some point, there will no longer be a difference between trade in the physical world and the digital way of doing business[9]. The two worlds grow ever closer and eventually integrate.

1.8 Summary

In this introductory chapter, we have touched on the basics of "everything transaction."

- The concepts of *interaction* and *transaction* are closely related, in particular digitally, but there are also differences. In all cases, they are exchanges between two *actors* in specific *roles*, and almost always via an intermediary who facilitates the exchange. The roles of the actors can switch during the process (interaction) or remain fixed (transaction). There has to be enough *trust* between the parties involved to enter into an interaction. That trust is organized *implicitly* (interaction) or *explicitly* (transaction). In addition, there is an intermediary who facilitates the exchange by, among other things, organizing the trust.
- *Intermediaries* facilitate exchanges between two actors. We distinguish three types of intermediaries: the medium, the middleman, and the platform. A *medium* is a neutral carrier of interactions, like air, ether, or paper. When an actor, entity, or party serves as intermediary, we call that a *middleman*. *Platforms,* finally, are the factories of the middlemen that by definition, are connected to a certain type of medium; for instance, a website or a shopping center. A medium can operate independently as an intermediary, while a middleman always needs a platform that uses a medium.
- In principle, a medium operates in accordance with the laws of physics, which are infallible. That is the reason why actors can assume that their exchange will be reliable. The Internet is an exception to that rule, in that it can only function as a mature medium after important technical design flaws have been solved: the integrity of the data transmission and the authenticity of the actors has to be ensured. At the moment, the risks are, to a large extent, mitigated by middlemen by building trust mechanisms into their platforms. We call this *institutional trust*.
- A middleman who runs a platform by definition is faced with two-sidedness because he brings together two actors and facilitates their exchange. If both actors can be served in their roles with the same proposition because they have similar

needs, we call that a *symmetrical proposition*. If, on the other hand, they require different propositions because their needs are distinct, we call that an *asymmetrical proposition*. In the latter case, there is a *two-sided market*.

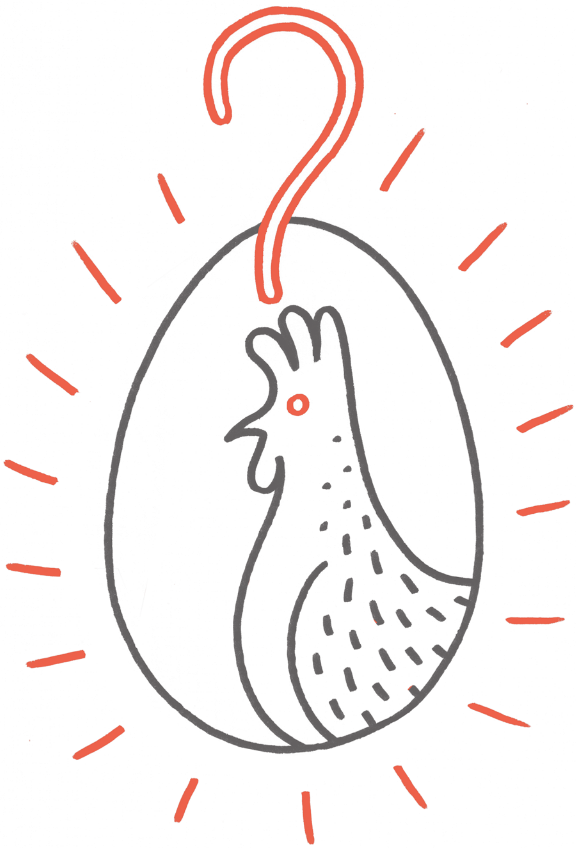
- Every middleman wants to realize growth and reach in his market. For growth with symmetrical propositions, *same-sided network effects* suffice. Each additional user adds value for all other users. Growth with asymmetrical propositions always requires *cross-sided network effects*. Additional users on one side of the market add value to users on the other side, mostly in a positive way.
- A middleman that runs a platform is itself not a party to the transaction between the two actors: it merely facilitates. This is a fundamentally different position to that of the middlemen in a *linear value chain*. The latter are enterprises that themselves take a risk position in the purchasing chain.
- Platforms can either work along value chains or across them. *Longitudinal platforms* concentrate a linear value chain or facilitate multiple steps of the buying process. *Transversal platforms* are platforms whose created value can be reused by other platforms. They operate across other value chains.
- There are two basic forms in which a middleman can organize its platform: the hub model and the network model. When the middleman itself services both interacting actors, we call that a *hub model*. When multiple middlemen work together to service two interacting actors in their specific roles, that is known as a *network model.* Often, the user group on one side can use any of many providers while still being able to interact with all users on the other side, regardless of which provider they are using.
- To enter into a transaction, a comprehensive *customer journey* is completed, consisting of the following stages: *awareness, consideration, purchase, service,* and *loyalty.* Part of that is the *buying process*, which in turn consists of six steps: *discovery, selection, agreement, payment, delivery,* and *customer care.* The seller will try to create as many interactions or *touch points* as

possible during the customer journey, with the aim of developing a *relationship.*

- Within the buying process, the three steps of *agreement, payment,* and *delivery* are inseparably connected to make up the *transaction trinity.* The transaction process can take place *synchronously* (almost at the same time) or *asynchronously* (separated in time). The latter is increasingly the case with transactions in the digital domain.
- Due to the immaterial nature of digital platforms, each exchange they facilitate requires *input data* and will, in turn, generate *output data*. These *transaction data* represent a value that can be used as a barter agent in other transactions, resulting in *data transactions.*
- Underlying each digital transaction, there is a *data layer* where the platform takes a position as actor. That layer represents a value of its own, to which the platform is fully entitled as one of the actors. This systematically gives the middleman access to all transaction data. In practice, there is an *imbalance* here, with platforms having an advantage over the actors (including consumers and businesses).
- Within a few decades, the Internet has evolved as a medium from an *information channel* into an *interactive medium.* At the moment, we are on the verge of the Internet as a *transaction infrastructure.* We call this the *transactional Internet.* Within the existing Internet, transactions take place on the basis of *institutional trust* that is organized by the middlemen with their platforms. The transactional Internet, on the other hand, provides *infrastructural trust*, with trust being embedded into the Internet itself.

Chapter Two

THE DYNAMICS OF TWO-SIDED MARKETS



2.1 Introduction

> **"To develop a two-sided market, you always have to solve the chicken-and-egg problem first."**

Successful companies like Twitter, TripAdvisor, and Alibaba prove that the Internet is the perfect medium for middlemen and their platforms to flourish. It provides the ideal infrastructure to bring large numbers of different users together quickly and efficiently. The middleman positions itself and its platform as a bridge between the users, allowing them to interact with each other with the use of its platform proposition. From that position, it always has to deal with "two-sidedness." The Twitter platform, for instance, brings together the writers and readers of ultra-short blogs, while Airbnb matches guests and hosts offering accommodation. As a digital marketplace, Alibaba is doing the same thing, facilitating the buyers and sellers of all kinds of products, with the platform sharing in the profits. As we indicated earlier, the needs of users in the role they play in their mutual interaction or transaction are essential. This is not only because those needs have to be met to ensure that everyone will want to use the platform, but also because it is on the basis of those needs that it is possible to distinguish different user groups. It is the distinct needs of specific user groups which will eventually lead to asymmetrical market propositions, bringing the two-sidedness to market level. In this case, we have a so-called *two-sided market.*

DEEPDIVE

Single-sided and multi two-sided markets

For the sake of completeness, when user needs can be covered by a platform with a symmetrical proposition, it is often referred to as a *single-sided market*. Examples are telephony, chatting, social media, etc. However, a single-sided market is nothing special: in essence, every market of supply and demand is single-sided, even without platforms; for instance, in linear commercial chains. In addition, there are *multi two-sided markets*, and these include more than one set of two distinct user groups. For instance, on Facebook, where advertisers are given access to consumers for ads, and websites where visitors can log in using their Facebook account. Two two-sided markets on one platform.

Two-sided markets have far-reaching consequences for the way a business is organized. For instance, every middleman in a two-sided market faces the "chicken-and-egg" dilemma: every new platform essentially starts with no users on either side of the market. At the same time, the platform only becomes relevant to users on one side when there is enough user volume—reach—on the other side. When there are no viewers to watch their content, no producer will want to show their programs on Netflix. On the other hand, the platform will not attract viewers unless there is something to watch. Initially, Airbnb faced a similar dilemma. When there are not enough providers of accommodation on the company's website, no one with travel plans will use it to book a room. On the flip side, homeowners are unlikely to want to use the platform unless enough potential guests visit the site. It is up to the middleman to solve the dilemma, with the appropriate approach, which is different than it is for companies operating in a linear chain.

In this chapter, we discuss all the basic principles of two-sided markets, which apply to all middlemen operating in or servicing such markets, but each company will have to organize its own solution. For now, there is no universal "blueprint" for it.

First, we present the role of a middleman using examples in the physical world: the traditional street market and the shopping center. Then we zoom in on the core concepts that apply to a two-sided market approach. We will show that a middleman has to develop a fitting proposition for both its target groups, one that enables interaction.

Next, the operator of a platform has to generate sufficient reach to solve the chicken-and-egg problem, in a process where network effects play a crucial role in quickly boosting traffic volumes. We will see that both the type of proposition and the price have a major influence on the network effects for both target groups. Middlemen who facilitate transactions with their platforms have to persuade users to start by registering and providing their personal information. By registering and validating the information during the onboarding process, it is possible to generate trust among users of the platform. Finally, we address the vulnerabilities and threats a platform faces and the way two-sided markets are being restructured and regulated in Europe, discussing issues like liberalization and data control in the process.

2.2 The Role of the Middleman

Middlemen are the driving force behind every platform. They design their platform for their market and trigger dynamics that allow the platform to function. The underlying principles of a digital platform are no different from those of a physical platform. Only the scale, speed, and possibilities are many times bigger in the digital domain, which is why such platforms can reach a very dominant position when successful.

As mentioned earlier, the concepts of two-sided markets and platforms are inseparably linked. If we go back to Figure 3 from Chapter 1, we see that platforms always facilitate two actors in their mutual interaction. Typically, the actors have the feeling that they are interacting with each other, but that is not, by definition, the case. The middleman services both actors in their specific roles with a platform proposition. We will explain using three different examples: the street market, the shopping center, and Airbnb.

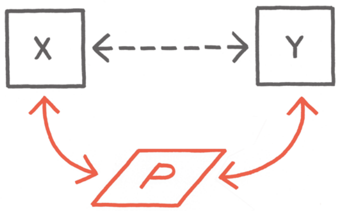


Figure 14. A platform as intermediary.

We can view a traditional street market as an archetype of a two-sided market, with the platform consisting of a collection of market stands where a variety of goods is on offer to visitors. The Albert Cuyp market in Amsterdam, the most famous street market in the Netherlands, began at the start of the twentieth century as a loose collection of street vendors and hand carts roaming the streets of the city. This led to chaos, so the city decided to establish a free market, initially only on Saturday nights. Some years later, it became a daily market, and to this day, it is one of Europe's busiest markets. In this example, the city council acted as middleman and facilitator of the platform. At first, their intervention consisted of assigning a few streets in Amsterdam, where, at certain times, vendors could sell their goods. That created the platform and allowed trading to take place. For visitors, it is good to know when certain products are being offered. For the suppliers, it is convenient if the middleman provides the infrastructure and advertises the market, and, in doing so, attracts visitors.

In the case of the shopping center, the role of the middleman extends beyond that. Companies that operate a shopping center rent out spaces that have been fully equipped for their purpose; in a good location, with the right appeal, and at an acceptable fee. The operator has already provided parking spaces, heating, toilets, and a lunchroom, so the shopkeeper does not have to worry about those. In addition, marketing for the shopping center is organized centrally, so the shopkeepers don't have to organize that on their own and spend their money twice. Providing properly functioning infrastructure is crucial to the business of the individual shopkeepers, although it will not in itself give them a competitive edge. On the other hand, if the operator has done a good job, it will be able to attract attractive shops and lure many buyers.

> A digital platform operates according to the same principles as the street market, but the middleman organizing such a platform has a more extensive role.

While a digital platform like Airbnb is built according to the same principles, the role of the middleman extends beyond that. On a digital platform, the actors don't know if the other actors are who they claim to be, so they will be more reluctant to do business with each other. This means that the middleman has to establish the trust that is required, and subsequently make sure that everything is in place to enable frictionless transactions. One of the ways Airbnb does that is by first having visitors on both sides of the market register and confirm their information, before allowing them to use the platform. Guests always have insight into the offering thanks to smart search mechanisms, but only after a successful onboarding can they also conduct transactions. To this end, all communication between a potential traveler and host takes place via the platform, even though they experience a direct interaction. When a transaction happens, the traveler pays the platform, which then, after deducting a fee, pays out to the host.

There are huge differences to a street market, where you do not have to identify yourself to gain access. You do not need to talk to the market manager about which apples you want to buy, nor listen to advise about which stand would then be most appropriate to visit. In addition, it would be very strange not to be able to pay at each individual stand but only at a central location. And it would be completely inconceivable to learn that the market manager would first pocket a hefty share before distributing the money to them before paying the stand owners at the end of the day.

However, in the current phase of the Internet, we do not consider it strange when a middleman operating a digital platform occupies that position. This is a direct consequence of the Internet, as an underlying infrastructure, lacking transparency. We can never be 100% sure who we are dealing with, no matter how much effort the platform has made to ascertain this. That goes for the buyer and seller alike. The only one we trust is the middleman, whose job it is to provide that trust. As such, middlemen operating in the digital domain have a more far-reaching role than those in the physical world. All interactions essentially take place via the digital platform, even though the actors involved may feel they are interacting directly, as in the example of Airbnb.

2.3 Propositions

It is the purpose of each platform to solve a problem in the exchange between two parties. In all kinds of exchanges, there are obstacles that prevent the two actors from interacting directly via a medium. As we can see from the examples in the previous paragraph, the obstacles can vary depending on the type of market. If we cannot see the other party, shake their hand, look them in the eye, and exchange the product for money on the spot, there is room for uncertainty. This is business as usual in the case of remote commerce, or in the digital domain. It is up to the middleman to identify and then remove, the uncertainties, allowing the two actors to interact—that is its added value. To deliver that added value, it has to know exactly which problem its platform will solve.

> **"Alas! How deeply painful is all payment"—Lord Byron**

On the basis of this core function, the middleman can create *propositions* for both sides of the market. These propositions describe the bundles of products and services that create value for the user groups in question, and ultimately for the middleman as well. For instance, the core function of a shopping center is to bring buyers and sellers together in a physical location. To this end, the middleman develops a rental proposition for the retailer, like an optimal mix of location, rental fee, and building finish. We already mentioned earlier, that this is more complex for transactions than it is for interactions, and how this affects the complexity and the scalability of a platform.

Symmetry

Before a middleman starts developing propositions, it has to understand the dynamics of the exchange it wants to facilitate. At the core, there is always asymmetry: to make sure an interaction is effective, the actors by definition have opposite functions; for instance, when X is talking, Y is listening. For the middleman, it makes a great deal of difference whether it can use one and the same proposition for both actors or whether it has to develop two different propositions to facilitate the exchange. To explain this concept, we introduced the notions of *symmetry* and *asymmetry* in the first chapter. The question now is whether the middleman can wrap the functionality for both roles into the same proposition. In the case of interaction, that is often possible, because interaction involves one process in which the two actors can switch roles easily; for instance, when making a telephone call, where you can call a friend one day, and then they can call you the next day. The same is true for social media, where you can either post a message or read other people's messages. In both cases, the middleman can offer users the same tool, in which the functionality for both roles is included. In this regard, offering a symmetrical proposition suffices.

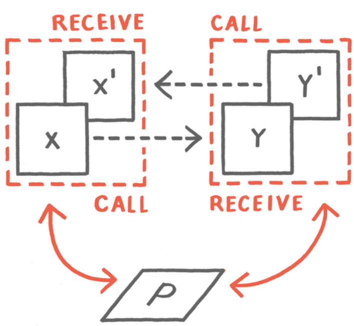


Figure 15. Symmetrical proposition for making phone calls.

> **There are always two sides -> <- to a transaction.**

When a middleman wants to facilitate transactions, however, things are more complicated. Now three separate processes have to be completed—agreement, payment, and delivery—in all of which the two actors have a fixed role. For this, they each need their own specific tools, and the propositions become asymmetrical. This is why a buyer has the functionality to make a payment, like a bank account and a payment card, while a seller has its own functionality and tools to accept a payment, like a bank account and payment terminal. Another example is a platform like Google, where users have access to a search tool with which to find the desired information quickly and efficiently, while advertisers have functionality with which they can target users with ads, within the indicated criteria. Middlemen who facilitate transactions clearly have to deal with two sides of their market because both actors have their own fixed needs.

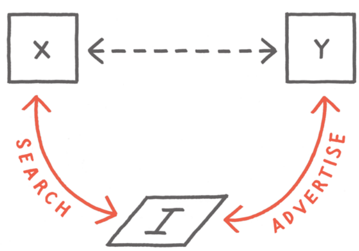


Figure 16. The asymmetrical propositions of a search engine.

Often, within platforms, both symmetrical and asymmetrical propositions are used. At LinkedIn, for instance, all users can put their professional profiles—essentially their resumés—online and use the symmetrical proposition to connect with each other, for free. A second group is made up of recruiters and headhunters, who can use all kinds of tools for a more extensive and deeper search into these profiles, and connect with targeted candidates. They have a different interface and tools at their disposal and also pay LinkedIn in hard currency.

DEEPDIVE

Stand-alone propositions

There is also something called a *stand-alone* platform proposition, which offers value to a user without an interaction with another user. Examples are Dropbox, Box.net, or personal data stores. Such platforms provide users with secure storage of digital documents in different forms. Purely for the user. Initially anyway, because such platforms often develop interactive sharing functions that allow users to share their content with others.

Many successful platforms started with a stand-alone or symmetrical proposition for a target group. These kinds of single-sided platforms are usually easier to develop and scale. Initially, the size of the user group attracts other users (*same-sided network effect*), and in a next stage, one (or more) other user groups, for which asymmetrical propositions are developed (*cross-sided network effect*), eventually leading to (multi) two-sided platforms and further growth acceleration. A platform like Uber provides different functionality to cab drivers than it does to passengers, which makes it a two-sided platform with an asymmetrical proposition. The same goes for Netflix, Amazon, and PayPal, which serve both sides of each of their markets with their own tools. We already mentioned advertisers as the second user group of Facebook. Other platforms, for instance, the websites of newspapers, where subscribers can get access to all the content using their Facebook account, can be seen as a third user group of Facebook. By using the same tool, users of multiple platforms can log in to them more easily. Another example was Skype Wi-Fi. Using this feature, Skype users all over the world could access Wi-Fi, and pay for it with their Skype account. This made Wi-Fi providers a second user group of Skype, and redefined Skype as a two-sided platform with both symmetrical and asymmetrical propositions. However, that is now in the past because Skype no longer offers the functionality [1]. Amazon, finally, offers buyers and sellers its own payment functionality that can also be used by sellers outside of the platform. This implies that a third group is also serviced with its own asymmetrical proposition. Table 2 provides more examples of platforms with stand-alone, symmetrical, and/or asymmetrical propositions.

The Importance of "Onboarding"

An important task of middlemen is to organize trust, especially when they operate in the digital domain. It is difficult for online users to know who it is they are dealing with on the "other side." It is hard to determine the identity of an actor, which creates a risk. On the other hand, the platform also has to be sure about the identity of the actor involved. For itself, but also to be able to facilitate the transaction between its users. That risk is a serious obstacle, one that the middleman to a large extent can remove. In the vast majority of cases, creating trust is part of the platform's market proposition. The first step in that process is registration, also known as *onboarding*. We all know the registration procedures of platforms like Airbnb and Uber, which you need to "go through" before being able to book a room or cab. By making sure that actors provide information about themselves at the initial registration, the middleman is able to determine their identity with a reasonable amount of certainty.

Table 2: Examples of platforms with symmetrical and asymmetrical propositions

Platform	**Actor X**	**Actor Y**	**Actor Z**	**Proposition type**
Uber	Passengers	Cab drivers		Asymmetrical
eBay	Buyers	Sellers	Advertisers	Symmetrical for buyers and sellers, asymmetrical for advertisers
Skype	Callers	People receiving calls		Symmetrical
Netflix	Viewers	Producers (including the platform itself)		Asymmetrical
Amazon.com	Buyers	Sellers (including the platform itself)		Asymmetrical
Amazon Pay	Payers	Payees		Asymmetrical
Facebook	Users posting content	Users reading content	Advertisers	Symmetrical for users posting and reading content, asymmetrical for advertisers
Facebook login	Users that are also users of "other platforms"	"Other platforms" whose users are also Facebook users		Asymmetrical
LinkedIn	Users making connections	Users accepting connections	Recruiters	Symmetrical for users, asymmetrical for recruiters
Dropbox	User storing documents	User with whom documents are shared		Independent for user, symmetrical for sharing
PayPal	User making a payment, payer	User receiving a payment, payee	Other platforms	Asymmetrical

The weight and complexity of the onboarding process depend on the type of service the platform provides. The financial sector, for example, is compounded with regulations, including in areas such as payments and privacy. This means that platforms that facilitate payment transactions have a legal obligation to ascertain the identity of their users. This also implies that they will have a serious registration and identification process, the results of which are used to determine and verify the identity of the users during the various steps of subsequent transactions.

The registration of a platform like Airbnb is also relatively heavy, due to legal obligations. The identity of the users is checked in different ways. As users start using more of a platform's functions and transaction risks increase, they have to provide more and more information. In some cases, they even have to provide an official identification document for physical identity verification. These procedures contribute to the reliability of the transactions that are made via the platform, which means they increase trust among users, which, in turn, has a positive effect on their willingness to enter into transactions. Platforms that only facilitate interactions also have to deal with registration procedures that people have to complete before being able to use the platform, for instance, when creating a Twitter account. There are three possible situations.

In the first situation, the user does not have to provide any information about itself, which is the case with platforms that only distribute information, such as Google Search. Users can use the platform in complete anonymity without having to cross any threshold.

In the second situation, the user has to register once to be able to use the platform's services. In that case, a relatively light registration process is an integral part of the proposition. It can be seen as the "first moment of truth[2]." For a user, it is a first experience with the platform. The satisfaction with the registration process will, to a large extent, determine the verdict about the actual service that the user can only start using afterward.

In the third situation, an actor, after going through an initial and relatively light registration, provides more and more information about itself, to bring its onboarding to the next stage and get access to the next set of functionalities. This version is also known as *phased onboarding* or *progressive disclosure.*

We will take a closer look at this in Chapter 4.

Generally speaking, during the onboarding process, information is collected about the actor's identity, which it needs to provide to be able to use the actual platform proposition. Due to its conditional and one-off nature, the onboarding process often does not get enough attention during the development of the product, even though it is a crucially important step. This is because, of course, having to register is a threshold that demands quite some time and effort on the part of potential users, in addition to privacy concerns. As such, almost all middlemen face the challenge of persuading users to actively provide information about themselves before being able to use the platform's services. The middleman will have to do its best to try and make the registration process as easy and attractive as possible to invite users onto its platform.

Making the onboarding process an explicit and integral part of the proposition acknowledges its strategic importance. For example, by using a staged approach, with the user being rewarded after each action. The user experience of this conditional functionality has to be at least as good as that of the core functionality that made the customer decide to select the platform in the first place. In other words: the registration process for Netflix has to be at least as easy as using its services is afterward. A consistent experience is essential, otherwise, too few users will be prepared to take the first hurdle, negatively affecting the platform's ability to scale and resulting market share.

A middleman can make the registration to its platform more attractive by "rewarding" the user after each step and encouraging it to go on.

We must note that a recent initiative such as Diem puts onboarding in a different light. When billions of people are "onboarded" in a new trust infrastructure in a relatively short period of time, this will eliminate major parts of the onboarding processes of individual platforms also using this infrastructure, lowering the threshold to using their core value propositions.

2.4 Network Effects

Uber does not own a fleet of taxis; Airbnb does not own any real estate to rent to people, and nor does Facebook create any content. Nevertheless, they have a lot of value. Unlike traditional enterprises, whose assets, turnover, and profits affect their value, the value of digital platforms is above all determined by the "reach" they have managed to realize within their market. Ultimately, they will have to monetize that reach, and their ability to collect, structure, and use data in a certain way is a crucial element in that. While in traditional economies of scale costs reduce on the production or supply-side, digital platforms are characterized by demand-side economies of scale: with each additional user active on the platform the value to its users increases, which, in turn, boosts demand. Well-functioning platforms are like magnets: they are able to attract users in their market in ever greater numbers. This is the result of clever network effects that an intermediary manages to set in motion[3].

Each successful platform has this defining moment: from that point on, things really took off. The network effects kicked in; suddenly, users flooded in on both sides. That magical point, when everything comes together, and the effects reinforce each other, is what Canadian author Malcolm Gladwell calls the *tipping point*, which he describes in his book with the same title as "the moment of critical mass, the threshold, the boiling point[4]." By the way, there has been some criticism from the scientific community regarding this phenomenon because the irreversible moment cannot be predicted and only determined in hindsight. Nevertheless, when talking about platforms and network effects kicking in, it is important.

All successful platforms, however, start with virtually no intrinsic value, without users. The main question for the middleman is where to start.

A platform without supply does not work, but if there is no demand, that isn't very promising either. Whether it's an old-fashioned discotheque or a contemporary dance club, if there are not enough girls on the dance floor, the boys won't show up. And if there are no boys, girls will lose interest quickly. The notorious chicken-and-egg dilemma. How do successful platforms solve this problem?

> The tipping point is the magical moment when everything comes together, and the platform really takes off. The network effects reinforce each other, and critical mass is reached.

With its platform, Airbnb provided a solution to a concrete problem: the limited supply of sleeping accommodations, which, in addition, was relatively expensive in the form of hotel rooms. By offering private homes as accommodation, the supply of sleeping accommodation increased, and it became much more differentiated. In addition, thanks to Airbnb, the price of the available accommodation fell by 30-80%[5].

Initially, Airbnb focused on cities with sold-out events, where there was an immediate shortage of accommodation. This enabled the company to organize the demand side of its platform, using traditional marketing, like branding, design, and targeted advertising. Hosts were persuaded to provide accommodation by calculating what they could possibly earn. In most cases, the platform was able to keep its promise because guests were essentially lining up. It was a successful approach that allowed the company to create reach on both sides of the market, but it was not enough to reach the tipping point. The tool that allowed homeowners to make professional photographs of their homes had a demonstrably positive effect on the number of users, but the real success came with their "social connections" feature, whereby guests could see on social media which of their friends had also stayed at a certain location. That generated trust and allowed critical mass to be reached.

> **For Airbnb, it took three years for its platform to reach cruising speed. Auction site Catawiki opted for a phased approach to reach success.**

At the moment, Dutch auction site Catawiki is the fastest-growing auction house in Europe. Founder René Schoemaker, who is an avid cartoon collector, spent hours on eBay, browsing through tons of uninteresting pages. This sparked the idea for a digital auction with a professional curation system, where experts select objects and provide a qualitatively attractive offer. The founders acknowledged that it would be difficult to start an auction site from scratch, and decided to take a phased approach. In 2008, they started building a community around a catalog with collectibles. Everybody could add to it, as well as record their own collection in it. This enabled the founders to attract potential buyers and sellers to their platform with a relatively simple, stand-alone, and symmetrical proposition. It was only in 2011, when the community was big enough, that auctioneers were drawn in with an asymmetrical proposition. At that point, the transaction component was added to enable collectors to trade with one another. A special system was introduced to ensure that the risk for users was limited: the buyer's money is held by the platform until the objects have actually been delivered.

Initially, Catawiki only dealt in real collectibles, for example, postage stamps, coins, and model trains. Later, this was extended by adding special objects like watches, art, and classic cars. By now, Catawiki facilitates more than 185 auctioneers, who authenticate, curate, and evaluate objects. The platform attracts around 14 million visitors a month and auctions over 50,000 items in more than 300 auctions per week, adding up to over 10,000 auctions a year[6].

Types of Network Effects

There are two types of network effects that can influence the reach of a platform in a two-sided market: *same-sided* and *cross-sided* network effects. Both can turn out to be positive or negative[7]. *Positive same-sided* network effects occur when attracting users to one side of the market leads to even more users on that side. An example of that is when a platform manages to attract so-called *marquee users*. For instance, when Richard Branson and other prominent businessmen started using LinkedIn, that attracted new users. Another example is when PlayStation manages to attract a lot of gamers to its platform, which is attractive to other gamers because it makes it easier to exchange and play online games against or with each other. However, these effects can also be *negative.* For instance, when, on a platform like Skype, network congestion occurs because of the excessive number of users. Or when a platform is no longer "hip" and its users "migrate" to a different platform *en masse*, an example of which is young Facebook users moving to Instagram with older generations (their parents and grandparents) becoming active on Facebook.

CASE

Facebook hit the ground running

In the early phase of Facebook, there were competing social networks that offered roughly the same bit that ultimately failed to make it. Facebook regularly presented something new, each time generating new network effects that allowed the platform to grow quickly. How did founder and—at the time—student Mark Zuckerberg manage that? First of all, his platform provided the perfect match for an urgent need, making it indispensable for every Harvard student. Facebook was *the* way to find out who was a student at Harvard, which of them were in a relationship and, more importantly, who was no longer in a relationship. In short, who was available on the prestigious love market. A golden move. Facebook quickly expanded to other universities and managed to create reach on both sides of its market.

From the initial experiences in the micro-environment of Harvard, a number of important lessons were learned: for instance, any new user had to be linked to at least ten friends within two weeks to keep them on the platform. Facebook responded to that by suggesting new friends to people, by encouraging them to import other contact files, and by conducting e-mail campaigns, with targeted ideas for inviting even more friends. Figure 17 shows that the initial network effects played an important role in the success of Facebook—but that was not all. New functionalities were added regularly, giving users even more reasons to join up and for existing users to use the platform more intensively. Examples are the introduction of the chat function in 2008 and the timeline in 2010.

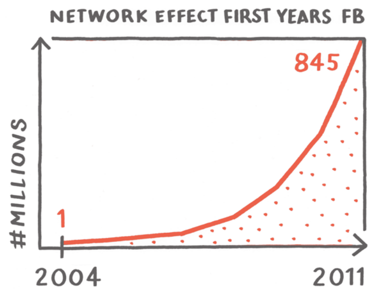


Figure 17. The network effects in the first years of Facebook[8].

The magical year for Facebook was 2009 when everything came together in financial terms, and the company started making a profit for the first time[9]. The introduction of the Like button played an important role. It again attracted more users and helped advertisers target potential customers more accurately. While until 2008, revenues had been limited and the costs enormous, the tipping point was reached in 2009: turnover tripled, while the costs only doubled, allowing Facebook to make a profit.

In the case of *positive cross-sided* network effects, middlemen creating volume on one side of their market also create value on the other side of their market. To stick to gaming: a game developer will only start working for a platform when it has enough gamers, enabling a recoup of the development costs; while gamers will only be interested in a platform when it offers enough games to play. *Negative cross-sided* network effects can occur when too many advertisers are active on a platform like Facebook, and users become annoyed. However, in practice, these effects occur less frequently.

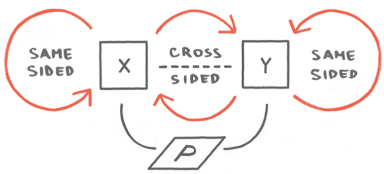


Figure 18. Same-sided and cross-sided network effects in platforms[10].

In the first chapter, we already touched on the connection between the type of proposition and the network effects. Most platforms that facilitate interaction, like Skype or Instagram, use the same proposition for both sides of the market, enabling every user to act in either role. With the Skype software, you can call people and be called. And when you use Instagram, you can post pictures and watch pictures that other people post and respond to them. In the case of such symmetrical propositions, same-sided network effects are enough: when a middleman manages to attract enough users to post content, they can use the same tool to view the posts of others.

It is more difficult to scale transaction platforms due to the asymmetrical propositions and the relatively heavy onboarding process for users.

For platforms facilitating transactions, things are more complicated. As we saw earlier, the market for credit cards is characterized by an asymmetrical approach. Credit card companies like Visa or American Express have two user groups: the merchants and the cardholders. Both groups have their own proposition: a credit card for the customers, and a payment terminal for the merchants. For both groups, adoption on the other side of the market determines the value of the credit card. A credit card company will have to think of something for both sides of the market to set a cross-sided network effect in motion, making the platform attractive to the other side of the market. Scaling two-sided markets always requires cross-sided network effects, which makes it more difficult. In Chapter 4, we describe how payment platforms PayPal and iDEAL overcame this challenge.

See Chapter 4.

Also, the relatively heavy onboarding process used by transaction platforms can be at odds with the growth targets, as we discussed before. In particular, the onboarding of professional or business users is often subject to regulation. Potential users can perceive that as a threshold, especially when it is not a smooth process. It takes time and money on the part of the middleman to design this first step well. However, when it does manage to recruit quality users at scale, the value of its platform will grow exponentially.

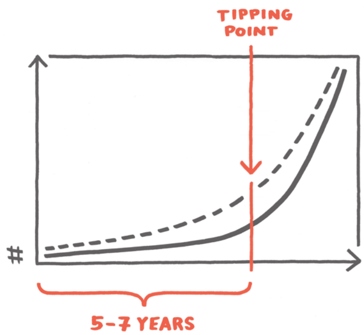


Figure 19. It typically takes 5-7 years for a transaction platform to "tip."

Advancing technology helps lower this barrier. Think of mobile photography of physical documents, live video chats, or biometrical recognition of one's fingerprints, face, or voice. Thanks to smart combinations of these technologies, the duration of the onboarding process can be reduced substantially, from weeks to days, from hours to minutes, or even from minutes to seconds. More and more banking platforms, for example, replace passwords with biometrical login procedures. Customers of the American bank Wells Fargo can access their bank accounts after a retinal scan with their mobile phone, while another American bank, Citigroup, is able to identify 800,000 credit cardholders through voice recognition[11]. It's true that these developments are still in their early stages and, in most cases, more elaborate initial registration procedures are needed to determine a new customer's identity, but it is a trend that cannot be stopped. It offers a potential competitive edge, as fast-growing new banks such as N26, Revolut, and Monzo show.

There is a good reason why fintech players all over the world are working on registration procedures that demand little from the users and at the same time are secure, and that meet the increasingly strict legal requirements. The ultimate goal is the *one-click signup*, whereby the digital identities of actors are immediately suitable for entering into legally binding transactions. Onboarding will then be nothing but a minimal obstacle for the middleman to trigger network effects.

DEEPDIVE

Three “laws” for platform value

Valuing a platform has been keeping minds busy for ages. In that context, it is interesting that there appear to be three “laws” that apply to communication networks[12] and that seem to have a direct relationship with the phases of the Internet.

The first one is **Sarnoff’s Law**, which states that the value (V) of a broadcast network is proportional (α) to the number of users (n): $V \propto n$. For example, Yahoo!.

Metcalfe’s Law applies to peer-to-peer communication networks where users can all connect and interact, and it states that the value is equal to the square of the number of users: $V \propto n^2$. The interaction phase of the Internet is characterized by this type of platforms such as Skype, Twitter, LinkedIn, and Facebook.

Advancing insights then produced **Reed’s Law** for group-forming networks. This law applies to flexible communication networks where users can form subgroups, and it states that the value is then equal to the number of possible subgroups that the users can form: $V \propto 2^n$. The value will grow even faster than it does with peer-to-peer groups. Examples are WhatsApp and Slack, more recent interactive platforms. The question now is, of course, what the value will be of platforms that will originate in the next phase, the transactional Internet?

Figure 20 indicates how a middleman can develop a platform strategy on the basis of network effects and platform value. Looking back, many successful platforms—knowingly or unknowingly—adopted such an approach. When nothing is done, user volume will only “tip” after quite some time. How long that takes depends on many factors, including the onboarding and relevance of the core function to the users. This is shown in the chart on the left. By recognizing a possible symmetrical proposition within the user group and giving it a greater priority, the tipping point for this group can be pulled forward in time with a same-sided network effect, as the chart in the middle shows. The chart to the right shows how the value that the first user group represents can be used to bridge the time it takes for the other user group to grow. Cross-sided network effects help shorten that time.

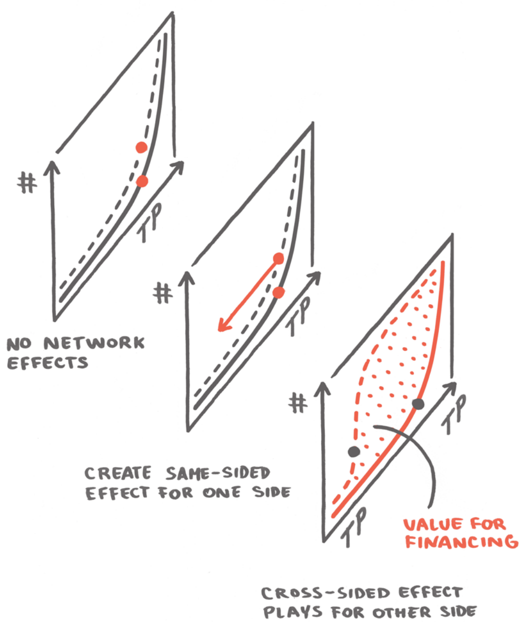


Figure 20. Strategy for the acceleration of platform growth and value. (TP = Tipping Point)

Willingness to Pay and Business Model

The book *Business Model Generation* by Alexander Osterwalder and Yves Pigneur[13] elaborately describes the development of business models using the very practical Business Model Canvas. *Multi-sided platforms* are one of five *patterns* they identify. Rightly so, as business models for two-sided markets have specific characteristics, and the pricing has its very own dynamics.

Reading tip: *Business Model Generation* by Alexander Osterwalder and Yves Pigneur.

The middleman will try to maximize profits across the separate user groups, which provides room to maneuver: by subsidizing one side of the market with income generated from the other group, network effects can be triggered[14].

But in determining the price strategy, the middleman will need to have a thorough understanding of the "willingness to pay" on both sides of the market. This represents the maximum amount users are definitely willing to pay to use the product or service. In some cases, users are not willing to pay anything at all. Charging a fee may result in users leaving the platform and thus creating negative network effects. But if you get it right, your revenues increase immediately. A good example is the Dutch platform Marktplaats.nl (now part of eBay). All advertisements were initially free, and the enormous growth of the platform led to ever-increasing costs up to a point where it became a serious problem. From one day to the next, the platform decided to charge 6 euros for ads for products with an asking price of over 200 euros. The company hit the bull's eye because it kept growing, but now it also generated serious revenues. Willingness to pay is a dynamic phenomenon: as the platform develops, this can change[15]. Payment cards, for instance, were free in the early phases, and now, twenty years later, users pay an annual fee. That is possible because the perceived value has increased. The middleman has to find out which circumstances increase the willingness to pay. Once it has been determined which side of the market is the most sensitive to price fluctuations, subsidizing that group may pay off, allowing it to pay less than the normal price levels for the service in question. In some cases, those subsidies can be permanent, and in other cases, they are used as a marketing tool to attract enough users. For instance, early on in its existence, PayPal temporarily gave money to new users, as an incentive. Once the platform had reached a certain volume, this was no longer necessary because it had become much easier to attract new users.

> Subsidizing one side of the market can pay off in order to create network effects on the other side.

This strategy can be successful when demand among the second user group increases strongly as a result of the growth of the first group, so where there are cross-sided network effects. Subsidizing one side of the market, the *subsidy side*, will pay off as long as the costs can be recovered on the other side of the market, the *money side*[16]. A well-known example where this approach was used is the payment market, where cardholders (subsidy side) initially did not have to pay a fee for making a payment; unlike merchants who had to pay for the payment terminal, in addition to paying a fee for each payment (money side). The market for software applications is similar to that. The greater the number of applications, the more attractive the software platform will be. All kinds of development tools are made available to software developers (subsidy side), while users are asked to pay a fee for the applications (money side).

A common misconception is that this is the same thing as the models that are used to sell razor blades, printers, and games. Gillette subsidizes its cheap blade holders with revenues from the relatively expensive razor blades. Hewlett-Packard does the same thing with cheap printers and expensive toner, and Nintendo with relatively cheap game consoles and expensive games. Although in these examples, one product is being subsidized with revenues from another product, it is fundamentally different. There is no interaction or transaction between users; it is a stand-alone proposition to the user. In fact, the money/subsidy strategy can only be applied with asymmetrical propositions because, when the proposition is symmetrical, the entire user group has the same proposition, making it impossible by definition to use price differentiation. Distinguishing between consumers and business customers in such a user group often results in business-to-consumer (B2C) and business-to-business (B2B) propositions, with different pricing, enabling the company to generate revenues anyway.

A frequently used platform tactic is to—knowingly or not—start with a symmetrical proposition, which is typically for free. It is relatively easy to scale such a platform with same-sided network effects, increasing its reach. Facebook was able to reach a tremendous volume very quickly with a symmetrical proposition in the form of an online Facebook account for users who could post as well as read content. It was only afterward that Facebook leveraged that reach among advertisers, a new user group with an asymmetrical proposition and its own revenue model. The enormous number of users had a cross-sided network effect on the advertisers, enabling Facebook to evolve into a two-sided platform. All the initial users make up the subsidy side, while the advertisers bring in the money. As Table 3 shows, it is usually the demand side that is subsidized: consumer end users are charged as low a fee as possible, creating an attractive market potential for providers. We can see this in exchange platforms like Uber and eBay, an online retailer like Amazon, and a payment platform like PayPal: they all pamper the consumer end user. And although Netflix does not have a subsidy side in its market, it does manage to attract many paying viewers thanks to its varied range of high-quality TV shows and movies, as well as a clever marketing strategy. Initially, new subscribers were given a three-month free trial. They also give their customers exclusivity, with TV shows of their own making, like *House of Cards* and *Narcos*, which are very successful.

Spotify is an example of the *freemium* model, which uses a basic proposition that is subsidized by advertisers. Thanks to that low threshold, free users' willingness to pay is increased, persuading them to take a paid subscription, moving part of the subsidy side to the money side.

Although this approach is widely used, it is no guarantee for success. There is always a risk that the discount given to the subsidy side is not recouped. When that happens, the middleman has to change its approach. That kind of flexibility turns out to be important. In its early stages, Google loudly proclaimed it would never allow advertisers onto its platform because that would call the objectivity of the search results into question. But it turned out that advertising was a golden business model and the company earns 210 billion US dollars in advertising revenues annually (2021), and there is no end in sight for its growth yet[17].

Airbnb was another company that initially didn't know on which side of the market it would earn money. And in fact, on Airbnb, it is the homeowners who are subsidized, having to pay Airbnb only 3% of the booking amount, as opposed to 6–12% on the guest side, depending on the type of reservation. So, a different setup compared to most platforms.

210 billion USD

Google makes about 210 billion US dollars annually in advertising revenues, and there is no end in sight for its growth yet.

Table 3: Platforms of which one side is subsidized

Platform	Actor X	Actor Y	Actor Z	Subsidy side
Uber	Passengers	Cab drivers		Passengers
eBay	Buyers	Sellers	Advertisers	Buyers
Skype	Callers	People receiving calls		None
Netflix	Viewers	Producers (including the platform itself)		None
Amazon Pay	Payers	Payees		Payers
Facebook	Users posting content	Users reading content	Advertisers	Users
Facebook login	Users that are also users of "other platforms"	"Other platforms" whose users are also Facebook users		Users
LinkedIn	Users making connections	Users accepting connections	Recruiters	Users
Dropbox	User storing documents	User with whom documents are shared		None
PayPal	User making a payment, payer	User receiving a payment, payee		Payers

BACKGROUND

Reach, conversion, cost

We often assume that the use of new payment services is evaluated primarily on the basis of costs, or cost per transaction (or rather per payment, to be more precise). However, our many discussions and talks with retailers reveal a more nuanced picture, which itself is explainable. The idea that costs are the main criterion comes from physical retail, where new payment methods are indeed assessed above all on the costs per transaction. However, that is because their physical restrictions allow them only to serve a part of the total market and the existing payment methods meet two conditions completely: everyone who wants to pay has a valid payment method, and everyone knows how to use it. In other words, the addressable market of a physical retailer is not limited by the reach of the payment methods and the payment conversion is always 100%, or you can't take your goods with you.

But in the digital world, things are a little different. For online platforms, the good news is that, in principle, they can serve the entire world and that their addressable market is essentially limitless. Anyone can buy from a platform, provided they pay, which they can if the payment method they want to use is accepted. But that is not always the case. Not everyone who wants to buy something is able to. The addressable market of a platform is limited to the cumulative reach of the payment methods it supports. The greater the number of payment methods, the bigger the addressable market, the higher the revenue potential. A second consideration is conversion. If a customer wants to pay but ends up not paying because the payment method is too complicated, this directly hurts the platform's turnover. The higher the conversion, the higher the turnover. This means that payment methods with a higher conversion are preferred to those with a lower conversion. It is only after that that costs become a factor since costs affect profit. Lower costs equal higher profit. So online platforms have a clear order when it comes to the way they assess payment methods: reach, conversion, cost.

To a large extent, this explains much of the success of payment service providers (PSPs) or payment gateways, which offer online platforms the opportunity to match their range of payment services to the market(s) they want to serve relatively easily, and letting customers decide how they prefer to pay. In this way, turnover is not affected in an unintended negative way. An added benefit is that the PSP simplifies the administration and compliance of the online platform with regard to the money flows. It has proven to be a powerful proposition.

2.5 "Winner Takes All"

When all goes well, a digital platform can grow at an incredible rate. For that to happen, however, a number of things must be in place: attractive value propositions being embraced by users, network effects doing their work, and revenues starting to come in. In that case, a digital platform can reach a size that it never could in the physical world. Especially in the United States and China, there are platforms that, in terms of the number of users, are on par with a continent full of people. The difference is that these digital continents have no physical limitations. They can just keep on growing. To illustrate: in Q2 of 2018, Facebook had 2.2 billion users[18], which equals the total number of Internet users in 2010. In 2017, WeChat in China grew to 1.29 billion users[19].

The analogy with a possible theory about how Earth evolved comes to mind. Long before people started roaming the Earth, there was one supercontinent on the planet, *Pangaea*[20]. Gradually, it drifted apart to create the continents that we see on our maps today, each with their own climate and ecosystem. After humans entered the picture, the continents each established their own culture, economic system, and social structure. A similar process is taking place within the virtual world: while at first, the Internet was one continuous cyberspace, closed platforms like Facebook, Google, Amazon, Apple, LinkedIn, and WeChat emerged, all operating as separate cyber-continents. Here the new icons of the business world, like Mark Zuckerberg and Jeff Bezos, the CEOs of Facebook and Amazon, respectively, are the kings and absolute despots of their own empires.

Figure 21. Analogy between the development of Earth and of cyberspace.

The fact that Apple, Google, and Facebook were able to get this big makes sense when you consider that it is possible in the USA, without restrictions worth mentioning, to roll out a service to 300 million consumers—in China, even to 1.3 billion people. For a long time, this gave the US and China a huge advantage over a continent like Europe. In addition, the dominance of the leading platforms can be seen as a victory for the American way of doing business. The conviction of being the only, and biggest, one in your sector is deeply rooted in American culture. You have to be "king of the hill" and create a monopoly, or you might as well pack up. The well-known Silicon Valley entrepreneur Peter Thiel, among other things, co-founder of PayPal and investor in Facebook and LinkedIn, clearly explained that vision in his book *From Zero to One*[21]. Europe is a completely different story. Although there are almost 750 million Europeans, it is a fragmented market with different cultures and some twenty-eight languages, and there are relatively many legal and bureaucratic restrictions. Scaling a platform in this market is asking a lot, from any entrepreneur.

Large-scale platforms keep expanding their businesses and doing everything they can to be an ever-bigger part of their users' lives. How does a middleman manage to make its platform "sticky," in order to get people to come back and make its platform part of their behavioral routines?

In his book *Hooked*[22], Nir Eyal states that a proposition preferably has to have the function of a "pain killer" that solves a pain or irritation that people have—often unconsciously. People must like the solution so much that they get "hooked" on it and automate it into their daily routines. So-called "vitamin pills," products that solve a problem that people didn't even know they had, can eventually lead to a continuous form of pain medication through the routine use of the product. Users become increasingly locked in and more and more dependent on such a platform.

> In the digital world, consumers can live on different continents at the same time, making them less dependent on one platform.

Does that mean that users will slowly but surely submit completely to these influential companies? Perhaps, but they do have one important trump card. Unlike in the physical world, people can be on different continents at the same time in the digital domain. We call this *multi-homing*. An example is downloading two different browsers on your computer, making sure all your information does not end up with one provider; or using multiple messaging apps at the same time, so you are not dependent on the availability of individual apps. That only works if the onboarding thresholds and user costs are not too high. For instance, people are unlikely to sign up to HBO as well as Netflix, or open payment accounts at a range of different banks. It is only when it takes relatively little time and effort that multi-homing provides consumers with an easy way to limit the lock-in and be less dependent on one provider. This provides middlemen with an opportunity to create additional reach.

The enormous impact of the big platforms leads to growing resistance, typically because of the enormous amount of user data they amass. Although that is understandable, on the other hand, platforms need to have a certain size in order to be relevant and to survive. This explains why they try to make "their" solution work for many users. If a middleman also operates in a fragmented market because many providers offer a standard—something that does not always benefit users by the way—the middleman will have to find ways to make its standard available to large parts of the market.

DEEPDIVE

The vulnerability of platforms

Although all platforms have the ability to grow extremely quickly, at the same time, they are also vulnerable. There are three risks they are facing: negative network effects destroying the initial success, becoming redundant as a result of a competing platform providing overlapping services, and the need to overhaul the business model when circumstances so dictate.

The first risk is that the *sentiment* about a platform can turn. Because their value is created in the market, platforms are continuously dependent on the enthusiasm of their users and other stakeholders. A sad example is the Dutch social network Hyves, which managed to attract 10 million users within a few years. It was then taken over by a newspaper conglomerate, only to see most of its users disappear and move to Facebook. Or the Belgian platform Netlog, once also a successful social media platform, that also ended up losing out to Facebook. Or the American platform MySpace, which, at its peak in 2007, had some 100 million profiles. Negative network effects can diminish the value of a platform, often even more quickly than it managed to grow in the first place. But Facebook isn't untouchable either. The platform's reputation took a hit after messages containing fake news spread like a virus among its 2.2 billion users, allegedly turning the American elections in Donald Trump's favor[23]. Since then, the issue of fake news has been high on Facebook's agenda.

The second risk facing every middleman is that of *envelopment*. This occurs when a platform is indeed swallowed up, and when its propositions are copied by a competitor who offers extended services and integrates the functionality of the stand-alone platform in its business. Even a major player like Apple had to deal with this problem. The iPhone was introduced by Apple because the mp3 market, in which the iPod had a significant share at the time, threatened to be taken over by companies developing smartphones. Steve Jobs was worried that another electronics company would do this, which made the introduction of the iPhone a defensive move, which, of course, didn't make it any less of a success.

TomTom faced a similar situation. Initially, the company sold navigation systems, but they had to overhaul their business model when similar tools became available for free on smartphones. From that time on, TomTom focused primarily on map functionality and geodata, only to run into Apple and Google when they started a similar functionality on the basis of their own maps. In theory, they could use TomTom's technology for that, but it does mean TomTom has another major problem. It's about time to pull another rabbit out of the hat.

2.6 Market Regulation and Restructuring

In addition to the particular challenges that characterize a two-sided market approach, middlemen also have to deal with external factors, which have a major impact on the structure and rollout of their platforms. Regulation and restructuring are a huge factor in this, especially in Europe. Leading platforms like Google have acquired a lot of power that, in many ways, transcends the legislation of the countries in which they operate. And yet the platforms, in particular, have played a crucial role in worldwide innovation in recent decades. Everybody agrees on that.

Too much regulation can have a stifling effect in such circumstances. This is readily the case in Europe, where every country has its own laws. However, every market does need a certain level of regulation, sometimes at a minimal level, in order to function optimally[24]. Here we discuss the main forms of regulation that platforms have to deal with in Europe: market liberalization, the prevention of abuse of power, and privacy legislation, respectively.

In Chapter 4, we will also look at regulations on the opening up of payment accounts by banks.

Liberalization

To keep a market genuinely open, national and international governments assume the responsibility of regulating certain markets. That may seem contradictory because governments are often associated with protecting internal markets. But that is not always the case. Take, for instance, markets in which the monopoly of what was previously a state company is dismantled. Such regulation can have an enormous impact on the strategic course of an organization, as telecom providers experienced when the telecommunications market was opened up. In 1997, for example, Dutch incumbent KPN was obliged to open up its network to other providers. The market players are forced into a certain level of cooperation, so as to be able to serve end users well. On the other hand, regulation has led to greater freedom of choice for consumers and to price reductions.

When national and international governments restructure markets, that is not always to protect them. On the contrary, typically, they flourish.

A similar situation occurred in the energy market, where all roles—sales, transport, sourcing—used to be concentrated in a small number of parties. In the early 2000s, the sector was privatized throughout Europe. Since then, different countries introduced specific legislation, designed to ensure a free market, giving the consumer access to different providers. The physical part, more specifically the cables in the ground and transformers of the network providers, stayed in the hands of regional monopolists, but those parties, as per the 2006 legislation, are no longer allowed to engage in the production and trade of energy. This legislation is considered a successful government intervention[25]. After all, it turned out that many private parties and corporations are more than willing to provide their surplus energy to the grid. So, it is a good thing for the network providers to play a neutral role so that there are no conflicts of interest.

The legislation also had a positive effect on European integration because it strengthened the link between the transport networks to the energy market of countries like Norway, the United Kingdom, Belgium, and Germany. Again, regulation increases competition, with positive results for consumers. On the other hand, as we saw in Chapter 1 with regard to "net neutrality," things can also go the other way. In December 2017, the US abolished net neutrality, the result being that not all Internet traffic is handled equally, but providers and other responsible parties can make a distinction between different groups and apply different conditions. That caused a lot of protests because it can further erode the trust in the Internet.

CASE

The challenge for Europe

Europe is a perfect example of a heterogeneous, fragmented market. The relatively small home markets each have their own language, culture, and preferences. When a platform is successful in one European country, chances are copycats will appear in other countries. By the time the original platform wants to expand into other European markets, it already faces local competition. As a result, none of the platforms reach the scale that is required to generate revenue. In most cases, they are surpassed by a similar platform that did manage to reach maturity in a different, homogenous market. Thanks to its scale, that platform then becomes the standard in the market, and its success allows it to attract new capital, with which it further optimizes and expands its propositions, seducing the European users who finally succumb.

Preventing Abuse of Power

Breaking the monopolies of digital conglomerates that originated as private companies, like Microsoft or Google, turns out to be tricky. In the late 1990s, an attempt by the European Union to split up Microsoft into one company that would focus on operating systems and another that would focus on other applications, failed. In fact, that would not have solved the core problem at the time: that fact that 90% of all the computers in the world were using the Windows operating system[26]. A split would have led to chaos on the software market and made the products considerably more expensive for end users[27].

Abuse of power, on the other hand, can be sanctioned successfully. In 2004, American competitor RealNetworks sued Microsoft. Their 64-page complaint explained that, in the period between October 2001 and March 2003, 207 million new PCs had been shipped, most of them with the Windows Media Player installed on them, compared to a meager 2% of all PCs on which RealNetworks' digital media player was installed. Microsoft had included this in the contracts with the PC manufacturers, which stipulated that they were not allowed to remove Windows Media Player and install similar programs, for instance, the RealNetworks media player, on the PCs[28]. Microsoft had made it virtually impossible for competitors to market products like the Windows Media Player by bundling that program with their operating system. In 2004, the European Commission fined Microsoft 497 million Euro for violating the anti-monopoly rules. The case was settled in 2005, with Microsoft paying 300 million US dollars in cash and announcing large-scale cooperation with RealNetworks in the areas of digital music and games.

Forcing a company to split up to break its monopoly can lead to market fragmentation, which will not always benefit end users.

In recent years, the European competition watchdog has taken a good look at the abuse of Google's dominant position in the search engine market, allegedly favoring its own services like Maps and Shopping. Android was the target of another inquiry because Google allegedly demanded that certain apps be installed as a default on Android devices. A third inquiry was focused on abuse of power with regard to offering advertising to third parties as part of the search engine functionality. In 2017, these inquiries resulted in a 2.7 billion US Dollar fine for Google, by far the highest fine ever in that type of situation[29].

Privacy Protection

Another subject that is high on the agenda is the protection of consumer privacy. This seems to make sense since every exchange that takes place via digital platforms generates data. In principle, everything is registered. Companies like Apple and Google aim to increase customer lock-in by offering them a wide range of products. In Europe, important steps were made with regard to privacy legislation, with the aim of better protecting consumer privacy and giving consumers more control over their own data. The EU's GDPR has been in force since April 2016[30], replacing regulation from 1995. The GDPR's aim is to give users control over their personal information, which is why companies that register such information now face stricter legislation. Data Protection Officers need to be appointed once a company transcends a certain business or data threshold, their task being to ensure that the sensitivity of the data is determined and that end users can always access the information. In addition, the owner of the data, in most cases, a consumer, has to give explicit consent for the data to be used. And it has the right to withdraw that consent if it so desires. When a company fails to meet the requirements, or a data violation has taken place, both the authority and the consumer need to be informed.

Since early 2016, European citizens have the "right to be forgotten."

Another important breakthrough is that users now have the "right to be forgotten." They can force search engines to no longer show information that they feel is irrelevant or no longer applies. Google has to honor those requests all over the world, regardless of the country in which the information is searched for.

New also is the right of *data portability* for users, so as to increase their data mobility. It offers them the possibility to move personal data from one information system to another, without any restrictions from a platform. In fact, the platform manager has to support this process by providing the information in a structured and machine-readable format. The system from which the data are exported also has to erase all the data and be able to prove it, once the client has canceled its account and any legal storage period has passed. That makes it easier for customers to "move" from one company to another, reducing the so-called *data lock-in*. Since May 2018, companies that fail to meet the new requirements of the GDPR risk having to pay fines of a maximum of 20 million Euro or 4% of their worldwide turnover in the previous year. This regulation aims to boost the position of consumers compared to that of the powerful platforms. It is easier for individual users to enforce their rights.

Platforms, on the other hand, have to make more of an effort to obtain and protect data, the essential raw material on which their services are based.

With the growing importance of digital platforms in our society, we can expect more regulations in the years to come. Because the subject matter is new, it is a challenge for the regulators to define effective and practical rules. In many cases, this is a trial-and-error process that keeps adjusting to the latest insights[31].

CASE

"Privacy is dead"

How do dominant platforms deal with the subject of data protection? Facebook deliberately explores the boundaries of what it can do with the information that users generate and, according to a critical minority, it oversteps its remit. In 2011, the American Federal Trade Commission filed an elaborate complaint, alleging that Facebook told users that their information would remain private, while simultaneously making it public in many ways. The matter was settled, and Facebook promised to do better in the future[32]. The incident where two cartoons of Turkish president Erdogan were removed by Facebook without the maker's consent, only to put one of them back later, also raised some eyebrows[33]. What is interesting is that most users don't seem too worried about what happens with their data. "Privacy is dead. At least it is no longer a social norm," said Mark Zuckerberg back in 2014[34]. The recent scandals surrounding data leaks, including those by the company Cambridge Analytica, once again have forced Facebook to modify its privacy policy. More about that in Chapter 4. Google takes a different approach. The tech giant banned third-party cookies in 2021 and introduced a more privacy-friendly way of profiling advertisers[35]. Not everyone is happy about this, as this new system reinforces Google's dominant position. Apple also got the ball rolling in 2021 and since then has required users to "be tracked" with a consent pop-up to agree that an app is allowed to do so[36]. This is a disadvantage for apps from companies that rely on advertising. The debate over business models for advertising and privacy is far from over, as privacy activists continue to pressure big tech companies.

2.7 Summary

The most important insights about two-sided markets and how the middleman can break the chicken-and-egg dilemma are listed here.

- The Internet turns out to be the ideal foundation for platforms that enable two types of users to interact in a very efficient way. These middlemen, by definition, serve *two-sided* or *multiple two-sided markets*, serving one or more sets of user groups, respectively.
- A digital platform operates on the basis of the same principles as the archetypical street market, although the role of a digital platform is often more extensive because here the middleman also has to organize *trust*. Another difference is that the services of a digital platform are typically based on *data* that it collects from the users.
- Middlemen have to know exactly which problem they translate into a *proposition* for their user groups. A proposition describes the bundles of products and services that create value for a market segment.
- Interactions are by definition asymmetrical because the actors have opposite, complementary roles: either you make the call, or you are called. If it is possible to wrap the different needs of the two actors involved in one and the same proposition, this is a *symmetrical proposition*. When each actor requires its own functionality, tailored to its role and needs, that is an *asymmetrical proposition*.
- *Onboarding* is the registration procedure during which information is collected about the actor's identity, which is conditional to using the platform. Onboarding is an integral part of the proposition and has to be considered that way. It can also be a layered process, in which information requirements increase when using more of the services. This is known as *progressive disclosure*.

- The *ramp-up* period of a two-sided platform can take a long time, which is why it is important to distinguish possible user groups and focus on symmetrical propositions to create *value* that can be leveraged to develop the platform further.
- To develop a two-sided market, the middleman has to solve the *chicken-and-egg dilemma* and create network effects. These make the platform serve as a magnet and attract more and more users on both sides of the market.
- *Same-sided network effects* apply when growth in user volume leads to even more users. In the case of *cross-sided network effects*, user growth on one side of the market also leads to growth on the other side of the market. The *tipping point* is the magical moment when everything comes together, and the platform really takes off. The network effects reinforce each other, and critical mass is reached.
- When setting a price strategy, the middleman needs a firm understanding of the *willingness to pay* on both sides of the market. This is the maximum amount users are willing to pay so that they will definitely use the service. It can be beneficial to give the most price-sensitive side of the market a price advantage, the *subsidy side*, if that can be earned back on the other side, the *money side*. Willingness to pay can change over time.
- In their choice of payment methods, online platforms don't look exclusively at the cost element because their market is determined much more directly by the features of online payment methods. They weigh *reach, conversion, and costs* of the payment methods, in that order of importance. This, to a large extent, explains the success of *PSPs*.
- Large-scale platforms that facilitate interactions have no physical limitations and—using a "winner-takes-all" approach—can easily reach the size of a digital continent, where they set the rules. As a result, users become more and more dependent on those platforms. An important advantage that the digital domain offers, however, is that people can live on

multiple continents at the same time, which is known as *multi-homing*. As a result, they are less locked in by a single platform, even though each platform will try to maximize its *stickiness.*

- *Envelopment* is a potential threat for platforms. It occurs when the core function of a platform as a whole becomes merely a part in the overall offering of another platform.
- In addition to the specific challenges of two-sided markets, every middleman has to deal with market regulation and restructuring, especially in Europe. For instance, through market *liberalization* in sectors such as telecom and energy, and market intervention in the case of *abuse of power.*
- *Privacy protection* for citizens is high on the agenda in Europe. It has led to the GDPR, with which European citizens have been given more control of their data since 2016, and which makes it easier for them to reuse their data. Platforms have to make more of an effort to obtain *explicit consent* with regard to users' *personal data.*

Chapter Three

EVERYTHING A PLATFORM

3.1 Introduction

> **“To manage the ongoing platformation, we have to embed trust in platforms more consciously.”**

It has been argued that “platforms are eating the world,” for instance in WIRED[1]. The figures show it: in terms of market value, 60% of the 100 biggest companies in the world generate over 50% of their profits from platform-related business[2], a share that will only continue to grow. Platforms have become part of our lives. They have changed the way parties deal with each other, and with that our socio-economic landscape. An irreversible trend that appears to be unstoppable for now, and that we refer to as *platformation.* Like transactions, platforms have been around since antiquity, with the traditional marketplace as their archetype. As the driving force behind every platform, middlemen set mechanisms in motion that enable platforms to bring users together in ever greater numbers.

Thanks to digitization, however, platforms have grown wings and have taken off. A middleman wanting to enter a market has the enormous advantage that a digital platform provides a hyper-efficient way to do so. Platforms not only play an increasing role in interactions but also in transactions, as part of the buying process. And thanks to digital platforms, almost all markets organize themselves in new ways. Facebook, Booking.com, Spotify, and Alibaba all managed to build a dominant position in a short period of time. There are numerous other examples of platforms that make us interact differently compared to a few decades ago too. Whatever it is, someone has built a platform for it; whether it is cab rides, guest beds, or lending out stuff like lawnmowers, it has inspired entrepreneurs to create success stories like Uber, Airbnb, and Peerby. At this point, we want to refer to the book *Platform Revolution*[3], which provides a good overview of the many aspects of platforms and of their impact.

Reading tip: *Platform Revolution* by Geoff Parker, Marshall van Alstyne, and Sangeet Choudary.

So, armed with the reference framework from the first two chapters, there is plenty of reason to dive into the world of the platforms, the middlemen's "factories." First, we will show the big picture. How have digital platforms influenced the value chains in many markets? How do they increasingly dominate complete markets? How can collaboration be organized with other parties within the worldwide digital infrastructure? To create some order in the many definitions of platforms—a word that is now used to describe pretty much anything—we outline a typology. What kinds of platforms are there? Based on that theory, we then look at how things work in practice. First, the middleman will have to make a fundamental choice: either to work together with a network to develop the market standard, or to go it alone, with a platform of its own. That decision has far-reaching consequences and, among other things, determines what the platform's competition will look like.

3.2 Redesign of Value Chains

In many markets in the physical world, the linear trade chain was an adequate solution. Products and services found their way to consumers via a range of agencies and other retailers, with all parties taking a share of the profits. The links in such linear chains are enterprises that themselves maintain stock and assume other risks. In other words, they act as one of the two actors involved in a transaction. As opposed to middlemen that often use their platform to facilitate exchanges, including transactions, for others. With the advent of digital platforms, supply and demand are brought together in a more effective way, and, in many cases, the distribution of products and services can be more efficient.

CASE

A platform for everything: Peppr versus Airbnb

The world is platforming. Platforms are being built for anything you can imagine. Where one middleman saw a future in paid sex, another group of ambitious entrepreneurs took a gamble on guest beds. This resulted in two successful platforms, Peppr and Airbnb. Within their respective domains, both platforms made optimal use of the advantages the current Internet had to offer. How did they go about it?

Peppr, a platform for paid sex

Not that it will necessarily take away the stigma, but both sex workers and their clients stand to benefit from the "self-cleaning opportunities" of the Internet. The Economist published an elaborate article about Peppr, an app for commercial sex in Berlin[4]. The idea is simple: you type in a location and get a list of the nearest prostitutes, complete with pictures, prices, and physical features. The results are filtered, and users can arrange a meet up for a few euros in reservation costs. The app brings together supply and demand online in an effective and discreet manner. Many tricky aspects are solved by the Internet. For one thing, in the past, prostitutes and clients had trouble finding each other. The search often took place in secret, with potential clients looking for references. The suppliers of the service were always worried about violence, criminality, and STDs—all that is changing now. According to The Economist, research shows that, as a business, prostitution is remarkably similar to other services. Providing customized solutions with associated pricing, and niche services with premium pricing: all those things also apply here. Customers can search on age, bust or clothing size, ethnicity, sexual preferences, or location. Thanks to digitization, both sides of the market can say goodbye to the traditional middlemen—often shady people—with a sigh of relief.

The suppliers increasingly control their own business and determine when and where they work. They can spend more time marketing themselves, for instance, with a website. These personal webpages allow them to advertise and close the deal online. Feedback from their customers on review sites helps others to take the step. To get to know more about the other party, separate services have been developed, like the American site Roomservice 2000 that provides background checks on sex workers for a fee. While traditional middlemen tended to have a bad reputation, a digital platform is able to create trust effectively. People who have never met before are still able to do business in a safe environment. Both parties stay in control of the deal, and both sides benefit: the customer can demonstrate reliability without having to give up its credit card information, and the phone number of the supplier is also not needed for the exchange. Both parties now have access to a wealth of relevant information, and they are both able to enter the market more securely.

Airbnb: creating a new attitude

From the start, the founders of Airbnb realized that their success would totally depend on the trust they would manage to create on both sides of their market, and they focused everything on making that happen. They did this successfully because, by now, the website includes over 3 million private accommodations in 191 countries and 65,000 cities. Since the company was founded in 2008, over 150 million overnight stays have been traded[5], although it did take four years to reach the first million. Before that, a number of things had to be put in place.

Airbnb was founded in San Francisco in 2008 by Brian Chesky, Joe Gebbia, and Nathan Blecharczyk. The called their company a "platform of trust." The idea was simple: they would create a platform on which private individuals all over the world could offer their house or a room for rent, and on which others could rent that accommodation. These days, we are totally accustomed to that idea, but a number of years ago, it was unthinkable to open up your home to total strangers or to rent accommodation from a total stranger. Airbnb managed to change people's perceptions in that regard. How? Participating in Airbnb means you cannot hide; you have to provide information to help create trust. The combination of the curation system, where content is verified first, and the scalable matchmaking, allowed the platform to grow quickly. This, in turn, helps to promote trust, because Airbnb is a well-known party in the market, in part thanks to its size: a self-reinforcing trust mechanism has been created.

When an actor wants to supply or rent via Airbnb, they have to provide relevant information about themselves. In addition, their reputation is also created on the platform itself, thanks to the reviews that both parties write about each other. The longer you participate in Airbnb, the greater the likelihood that you are trustworthy because untrustworthy people are removed from Airbnb. This creates a community with clear rules that are guarded by the platform, and by the participants themselves. As a result, actors trust the platform and, indirectly, each other.

Increasing Chain Concentration

Thanks to the Internet, we all have access to all information about any product, service, or topic at the click of a mouse button. While in the past, traders in the chain could make the difference with exclusivity in offers, information, and distribution channel, these days it is often no longer possible to distinguish oneself that way. The consequences of that simple fact are far-reaching.

Economic optimization reduced the value chain in every market to the lowest number of links.

The travel sector is a good example. Consumers no longer spend their Saturday afternoons visiting travel agents who guide them through a fraction of what is on offer. Instead, they visit platforms like Hotels.com, Expedia, Trivago, TripAdvisor, or Airbnb, where hotels from all over the world and in every price range present their offers, and in a way that makes it easy for the consumer to navigate. In addition, reviews from previous guests sketch a fairly reliable picture of the quality of what is on offer. The consumer can then make their own reservation at the supplier or hotel of choice. Traditional travel organizations with their own holiday packages that they buy from agents—either exclusively or not—and then sell to consumers in physical stores, hardly play a role anymore. Consumers have instant access to the majority of what is on offer and use the platform to interact directly with the hotel operator, without a need for other links in the chain.

Digital platforms compress the traditional value chain, as we can see in Figure 22. The profit margin that, traditionally, was shared among all the links in the value chain, is now divided among fewer parties. So, in addition to their size, which in terms of reach is many times greater than that of a traditional travel agency, digital travel platforms also manage to secure a larger share of the profits per booking or give part of it back to their customers by lowering their prices.

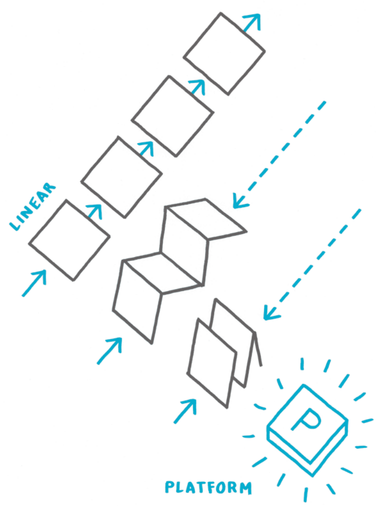


Figure 22. Platforms squeeze the linear chain like a harmonica.

Growing Digital Distribution

A second important reason why the linear chain has come under pressure is that the appearance of products changes dramatically through digitization. We have seen this with newspapers, books, and music. Products become data, and distribution becomes data transfer. Production and distribution no longer take place in the physical world, with factories, assembly halls, and trucks hauling the products from A to B, but in the immaterial domain, where a package of bits and bytes is sent to the end user. Delivery takes place with the same digital infrastructure, where supply and demand easily find each other: the buyer takes possession of their order—almost in real-time—with a few clicks, and at considerably lower costs. Increasingly we are moving electrons, instead of atoms.

Middlemen who are involved with distribution in the traditional chain have become largely redundant. The music industry, with physical carriers like LPs, cassettes, CDs, and DVDs being replaced in record time by platforms such as Spotify and iTunes, experienced this development first-hand. Wikipedia provides an almost nostalgic overview of these developments[6]. As a result, the revenue model has also changed dramatically. Profits no longer come from the carriers but from the content. There are now multiple revenue streams, with live gigs acting as the most important driver. “Content is king.” Both traditional middlemen and links from the linear chain essentially face a completely different playing field. The added value that they originally had has, in many cases, marginalized due to the emergence of digital platforms that have the potential of organizing all kinds of exchanges between actors in a more effective way. As such, platformation leads to value concentration in the chain, both in terms of net profit margins and the goodwill that is often associated with customer reach.

Ongoing Chain Integration

The digital infrastructure within which people can communicate in real-time offers businesses plenty of opportunities to work together in all kinds of new ways. After all, the use and distribution of each other's services have become a lot easier. We all know Google Maps, which includes Uber functionality, making it easy for people to order a cab, and we have already mentioned the cooperation between KLM and Uber. Twitter, PayPal, and Salesforce have grown by working together with parties that provide complementary services. These kinds of partnerships use Application Programming Interfaces (APIs). These are "software plugs" enabling third parties to develop applications "on top of" existing software. They can simply plug into a shared infrastructure, through which data about identity, online behavior, and supply and demand are registered, and economic interactions are facilitated. This is why you can use your Twitter account to access other apps, simply by connecting to that app and confirming the connection with your Twitter password. PayPal uses the same mechanism, making it easy to make payments at web stores. Another example is the customer-relations software of Salesforce, which is used as a basis for other applications, including medical applications made by Philips. That way, medical information about patients is exchanged digitally, making it possible to monitor patients in their domestic environment.

These kinds of partnerships are all made possible by the digital distribution of separate functionalities that are used or sold on complementary platforms. In the first chapter, we called them digital ecosystems, which are essentially different from platforms operating in a network model and working together on the same functionality. We will return to this form of strategic cooperation in Section 3.5. As a result, chains are becoming more and more integrated. All these businesses are aware that they can add value in different ways in the current landscape. They understand that that value is no longer only created within their own company, but together with other parties that they manage to engage. With that, the development of business processes transcends the level of separate entities. Successful organizations take full advantage of the present opportunities, often taking on an intermediary role, with their platforms as an indispensable machine.

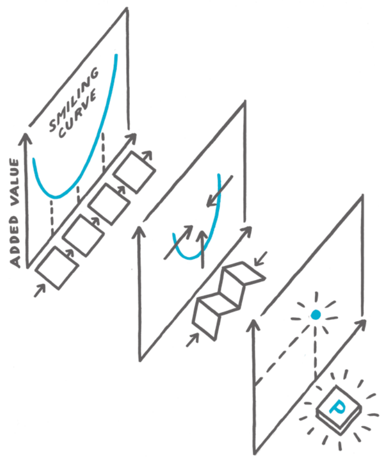


Figure 23. Platformation concentrates the value in the chain.

BACKGROUND

The end of the "smiling curve"

How do digital platforms influence the value chain in a market? To answer that question, the concept of the "smiling curve" can be helpful. It was introduced in the early 1990s to explain the developments at the time within the production chain of the electronics sector. It was invented by Stan Shih, founder and CEO of computer manufacturer Acer from Taiwan[7]. He noticed that a manufacturer, on the one hand, could add value at the start of the production chain in particular—the start of the smiling curve—where relevance is created at production level by innovative ideas and patents. On the other hand, they could do so at the end of the chain or curve, where end users have a recognizable experience—thanks to distinctive functionality—in combination with effective branding and customer care. The assembly or production of the electronics themselves, in the center of the chain or curve, is the least profitable. Companies like Apple outsource that part of the chain to third parties in countries like China, where their hardware is manufactured at low costs.

In many cases, the center of the curve is pushed out by platforms that can organize it much more efficiently. The X-axis of the graph is, as it were, squeezed together: the lion's share of the added value is provided by fewer and fewer parties. As a result, we see the contribution per party increase, along the Y-axis. A good example is Chinese manufacturer DealExtreme, where consumers from all over the world can buy gadgets directly. At the moment then, it is the digital platforms that create the shortest possible value chains.

Existing "corporates" also have to move into this new era, although it is often difficult for them to discard existing processes and infrastructures. However, there are all kinds of ways in which they can respond quickly to new developments, for instance, by participating in a number of networks that match their core activity. For instance, in the automobile sector, Fiat has set up partnerships with parties like TomTom, Reuters, and Facebook, to work together on what they call "connected cars." Cars that they will equip with features for communication, entertainment, and navigation, in such a way that the driver can (still) focus completely on driving the car. At least, that holds for as long as the vehicle still needs human attention because self-driving cars are being developed as we speak. These types of collaboration allow companies to seize opportunities that have the potential to change an industry at a global level. Ambitions that they would never be able to realize on their own.

Thanks to digital distribution, whereby platforms use and offer each other's complementary functionalities, companies are able to increase their impact considerably.

3.3 Types of Platforms

When competition is fierce, new dominant platforms emerge everywhere and manage to insert themselves between two types of actors, often representing existing supply and demand. Earlier, we talked about the example of Booking.com in the travel sector. Amazon had a similar effect in retail, and Uber in the cab market. In every imaginable market, there are, and continue to be similar developments.

A middleman's *raison d'être* is the removal of obstacles that keep actors from contacting each other directly. These obstacles vary per market and per situation. It is up to the middlemen to find the right solutions. They can do so in a number of ways, for instance via markets (where buyers meet sellers) or the media (where advertisers meet their target groups). Men and women wanting to meet each other once met in famous pubs, clubs, or discos. Now, many of them can be found on Tinder or Happn and all kinds of other platforms that meet this particular demand effectively. The government can also act as a middleman —for instance, by minting and printing cash money—so that buyers and sellers can pay each other with coins and bills that they both trust. In this next paragraph, we discuss the various platforms that exist and take a closer look at the role they play in facilitating transactions.

A Typology

Platforms can facilitate the trade process in a variety of ways. Although platforms are also widely referred to in a technical sense, this book adopts an economic approach. We focus on platforms that support the trade process by actively enabling interactions and transactions between two different user groups. To do so, we look at the universal buying process that we discussed in the first chapter of this book. It describes all the steps that two actors go through when they do business with each other. In Chapter 1, we slightly modified the buying process on the basis of insights about transactions, as a result of which it now has six steps: *discovery, selection, agreement, payment, delivery,* and *customer care*. The wishes of the potential buyer are paramount at every stage. The supplier will attempt to fulfill those wishes as best it can in order to increase its chance of a successful transaction. As we saw, the steps of agreement, payment, and delivery belong together in the buying process. Together, they make up the transaction trinity: a transaction is finalized when those three steps are completed.

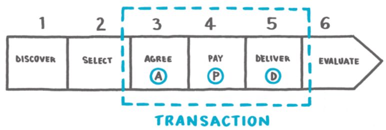


Figure 24. The six steps of the buying process.

What kinds of platforms can we distinguish within this trade process? Every middleman wants to accomplish something with its platform and adopts a specific approach to that end. The approach is subject to continuous development in order to improve the ability to meet customer demand. As a result, there is no conclusive typology of platforms. Most platforms will include features of multiple types because they have the ambition to realize multiple objectives with a broader range of functionalities. Within our scope, it is the division proposed by Evans and Schmalensee[8] that perhaps offers the best overview. All the platform types that they distinguish have a payment—by actor X—and a delivery—by actor Y—facilitated by the platform. The way this is organized varies per platform. Evans and Schmalensee consecutively distinguish *software platforms, exchanges advertising-supported media,* and *transaction systems*. This is the basis for the typology presented below, to which we have added a few categories, with a brief explanation.

> We distinguish five types of digital platforms: software platforms, exchange platforms, (e-) commerce platforms, media platforms, and transaction platforms.

Software platforms are typically linked to a certain type of hardware, for which software developers are given the tools to make applications, which they can later sell to the users of the hardware in question. Apple gives selected software developers access to the App Store, after which they have to try and make a profit by selling their games or apps to Apple users. Other examples are Nintendo and Sony, which let developers invent and develop games for the users of their particular game consoles. Again, APIs, (the software plugs we mentioned in Section 3.2) play an important role. These toolboxes are an efficient way to have third parties develop new functionalities and increase the user value of the platform as a whole.

Exchange platforms focus on *matchmaking*. Participants on both sides of the market can search or present the offerings, and matches can be made. Examples are auction houses, real estate middlemen, and dating sites such as Tinder. Also, however, literary agents and travel agents like Booking.com. In that sense, they fulfill the role of the traditional agent, but their factory has become a digital platform. We add *(e-)commerce platforms* as another category. These are platforms that, in addition to offering a matchmaking functionality, also facilitate the actual transaction. Examples are Google Play, Amazon, and Etsy. This type of platform facilitates the entire transaction process.

Media platforms focus on the exchange of content, the costs of which are often (partially) funded by the advertisements of third parties. The Huffington Post is an example of this kind of portal: the content, which readers perceive to be free, is largely funded via an advertising model. In that setup, the *targeting* of the visitors is an increasingly important element, allowing advertisers to target their ads with greater precision, based on the behavior data obtained from the use of cookies, for instance. Visitors end up paying for the use of the media platform with the data they leave behind, often unknowingly. In addition to the advertising model, media platforms sometimes also use a subscription model. Netflix is a well-known example. We have added *social media platforms*, such as Instagram, as a subcategory. They provide their users with the tools to share and receive information, pictures, and other content. Again, the dominant revenue model is based on advertising.

The final category that Evans et al. distinguish are *transaction platforms*, which are the core of this book, because this is where the worlds of platforms and transactions meet, eventually to evolve into the transactional Internet.

> Transaction platforms make digital transactions possible, with money as well as with data. They consist of payment platforms that organize trust in different ways, like identity platforms.

However, Evans et al. define transaction platforms as broadly accepted payment methods that enable the payment within a transaction. Think of credit cards or an online payment method like PayPal or iDEAL. As far as we are concerned, those are merely *payment platforms*. Other platforms, for instance, e-commerce platforms like Etsy, use such a specialized payment platform to facilitate the payment within online transactions. So, payment platforms are often used by "other" platforms, which use their functionality and the data they have collected. Because of this reuse by other platforms, payment platforms have their own position within the buying process. We will get back to this later.

Within our definition, however, the category of transaction platforms also transcends that of just payment methods. In the digital domain, the purpose of platforms is to organize the trust that is needed for a transaction. We call platforms that focus specifically on that aspect *identity platforms.* Their function is to determine the identity and authenticity of the actors involved and to then make that information available in a digital form. This is an important component of the trust that has to be ensured in transactions. A second addition to the description of transaction platforms by Evans et al. is that, in this book, we refer to payment solutions in a broad sense. Keep in mind that, in the digital domain, it is possible to pay with things other than money, for instance, data, likes, or credits. Platforms that facilitate those forms of value transfer, in our definition, also fall into the category of payment platforms. This leads to the categorization presented in Table 4.

Table 4: Typology of digital platforms

Type of platform	Description
Software	Platforms that are linked to a certain type of hardware or software, whereby developers are given the tools to make applications, which they can later sell to users of the same hardware.
Exchange	Platforms that bring together supply and demand, focusing on matchmaking. They are often based on the traditional intermediary role of a middleman.
(E-)commerce	Digital stores that enable matchmaking as well as digital transactions.
Media (including social media)	Platforms that focus on the exchange of content, whereby the costs are often largely funded through third-party advertising. The subcategory of social media provides users with tools for the mutual exchange of content according to a certain format.
Payment	Transaction platforms that facilitate digital payments, including well-known payment methods. Methods that allow other forms of payment, like data, also fall into this category.
Identity	Transaction platforms that facilitate digital transactions by organizing trust, like identity platforms.

DEEPDIVE

Technical platforms

In literature, platforms are defined in different ways. While we take an economic approach, with platforms facilitating exchanges that promote the trade process, others have a technical perspective. Although this does not fall within the scope of this book, we will take a brief look at this. We discuss two interpretations within that perspective: the first one describes internal and external platforms, while the second one addresses technical market standards. Both approaches are regularly referred to in literature and in practice.

Internal versus external platforms

Gawer and Cusumano[9] see platforms as a technical base infrastructure and draw a distinction between internal platforms and external platforms. According to that distinction, internal platforms involve one company or product, as a collection of properties organized in a shared structure, from which that same company can develop associated products in an efficient way. Sony, Hewlett-Packard, and Honda are examples of companies that apply this strategy.

The second category is that of external platforms, also known as industry platforms. These are suppliers of products, services, or technologies that serve as the foundation on which other companies can build their complementary products, services, or technologies. This second category has produced important innovations, such as microprocessors, which are embedded in all brands of personal computers. The current cloud platforms of Amazon Web Services (AWS), Microsoft Azure, and Google Cloud also fall into this category, as do smartphones that run on iOS or Android, which provide Internet access, on which search engines like Google and social networks like Instagram can be used. In essence, they are all platforms on top of other platforms.

Market standards

Platforms are also often referred to in the sense of technical standards within a market. A number of standards are extremely successful; they have a major impact on the way markets are organized. A well-known example of a market standard is Wintel, the large-scale cooperation between Microsoft and Intel, the manufacturer of microprocessors. The deal started in the early 1980s as a result of a very fragmented market for microcomputers, with many suppliers and as many standards. The two companies together acquired a dominant position overnight, and they are still the largest party in the desktop and laptop computer architecture. Wintel can be seen as an open standard for hardware and software to which third parties can add functionalities because different elements can be integrated into the system, and it is possible to exchange information. It is interesting for partners to participate in such a standard because it allows them to use its basic functionality and, at the same time, add features for special target groups. This prevents a lot of redundant work and accelerates growth in the market. A cooperation with a similar impact started in 1979 between Philips and Sony, with the aim of developing the global standard for the compact disc. The first CD in the world was produced in 1982 in the German town of Langenhagen. The rest is history.

Transversal and Longitudinal Platforms

Payment platforms occupy a special position within the buying process, as indicated in the typology outlined previously. While some types of platforms focus on one or more steps within one buying process, payment platforms are, for example, used by other platforms, to facilitate the payment step of the transaction. That is why we define payment platforms as transversal platforms: they operate "perpendicular" to chains. They are the opposite of longitudinal platforms, which operate "along" a chain. We introduced this distinction in the first chapter and now take a closer look.

Transversal platforms are platforms whose value can be reused by other platforms. Payment platforms fall into this category, as well as identity platforms, which focus on the authentication of actors—an important condition for the trust that is needed during transactions. In the case of payment systems, once a user has registered, for instance, with a credit card, it can then use this payment method at all other platforms that accept it. That means that the user only has to register once, instead of having to register over and over again for each transaction.

In addition, payment platforms also organize the necessary trust to arrive at a transaction by registering data about both actors, including the location, the device, the keystroke speed, the IP-address, etc. Based on that information, the authenticity of both the actor's identity is verified continuously throughout the transaction process. Thanks to the transversal reuse of that information, the users do not have to go through an entire registration process *within* a transaction.

> Payment platforms operate "perpendicular" to chains: their accumulated value can be reused by other platforms.

This does not only apply to payment methods or to identity platforms, which organize the trust between actors, even if that does not always have to lead to a payment transaction in money.

Over time, a party like Facebook has acquired a huge user group, which represents transversal value. That data about the digital identity of users can be reused by other platforms, for instance, during the onboarding and authentication of users. That process is a transaction in itself, representing a separate value. It is the function of identity platforms throughout the transaction trinity—agreement, payment, and delivery—to verify the authenticity of the actors involved. Which parties say yes to one another? Are we still dealing with the same opposite party at every step?

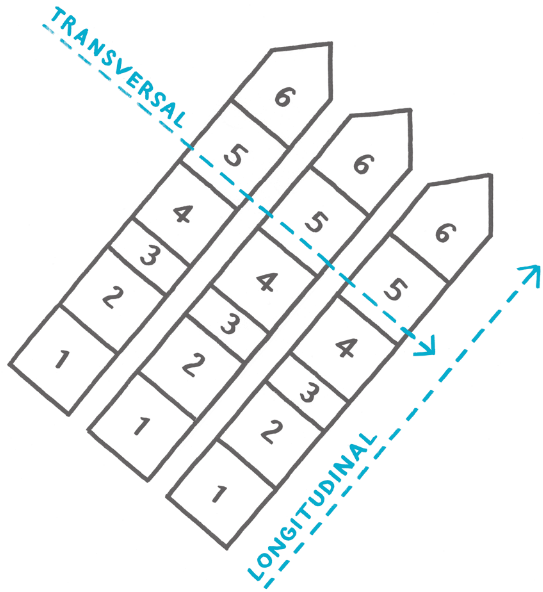


Figure 25. Longitudinal versus transversal platforms.

In addition to transversal platforms, there are also *longitudinal platforms,* which are platforms that concentrate a chain, meaning that they facilitate multiple steps within a value chain or customer journey. In the previous paragraph, we already discussed this type of platform. Often, the aim is to organize as big a share of the business process for the company's own customers. Well-known examples are eBay, Amazon, and Apple, which all facilitate a buying process of used goods: discovery, selection, and transaction, as well as, if necessary, aftersales services. These are unlike payment solutions, such as PayPal, which support a single step in the process, across all those value chains.

Can only payment platforms be transversal and no other platforms within this typology? Well, yes, to a certain extent. We can say that payment platforms, by definition, generate reusable value. But in addition, there are software platforms with a transversal added value, like

Zendesk or Intercom, for customer support, or Trustpilot, for reviews. These transversal platforms also specialize in one process step in the customer journey, bringing two groups of users together for other, longitudinal, platforms, without requiring transactions between them.

BACKGROUND

"Make or buy" of platforms

Longitudinal and transversal platforms reinforce each other. The reason for that is that it is a big ask to start a transversal platform. Often, reusing their data is an attractive alternative. It leads to lower costs[10] and accelerates the adoption of the product or service. Every middleman, nevertheless, makes the decision to create added value either by specializing in one process step or by integrating multiple process steps. Next, it has to decide whether to organize those steps itself or outsource them—the traditional "make or buy" consideration. However, the question is whether it has the same choice for the transaction steps, and, in particular, the payment function. In addition to the chicken-and-egg dilemma we discussed earlier, there are so many legal stipulations surrounding the payment process, that it is almost impossible for a transversal platform to do it all on its own.

In the next chapter, when we zoom in on "payments," we will discover that, ultimately, there is always a bank involved to process the payment. Transversal platforms can, however, organize parts of the payment function themselves. At Apple Pay, transactions are authorized under its own label, setting the payment process in motion. With this, Apple adds the first step of the payment process to its platform function. The remaining steps are then executed by banks and other parties. It is almost impossible to escape this unless a platform decides to issue its own currency. This has in fact been tried a few times with, for example, Microsoft Points and Facebook Credits. However, these initiatives were canceled because consumers were not interested in needlessly having to exchange their money. Amazon has not yet abandoned this ambition: Amazon Coins can be used to purchase apps, games, and in-app items[11]. All in all, there is a lot that has to be put in place for a platform to organize payment themselves, and this is why transversal platforms make up a category of their own. They facilitate the payment step of the transaction. The other part of the transaction, by the way, the delivery, is much easier for a platform to organize itself. For instance, Dutch online electronics retailer Coolblue, set up its own delivery services, while Amazon is in the process of examining whether it can provide this step in the value chain itself.

Hybrid Models

Platforms are difficult to pigeonhole. To optimize the services they provide to end users, middlemen often use hybrid models, and as a result, their platforms fall into multiple categories. As we saw earlier, most longitudinal platforms use a transversal platform that we all know to support the payment function, turning them into examples of hybrid models. For example, Uber is an online cab dispatcher where it is easy to book a cab and pay with an existing credit card—a transversal platform—making it possible to categorize Uber as an exchange platform with a payment function. The payment function is integrated so seamlessly within the user proposition that people don't really experience it as a "step." Uber now tries to build on that, as Apple and Amazon have done previously. Those platforms have collected so much user payment data over time that they were able to unlock that value as separate payment platforms, which we know as Apple Pay and Amazon Pay. Those kinds of platforms are a mix of longitudinal and transversal.

Another example of different functions overlapping is the Facebook, Twitter, or LinkedIn login function we talked about earlier. This is also used as a separate function by other platforms, such as Airbnb, making it easy for users to log in or register. For them, it is very convenient not to have to go through a different login and registration procedure for each new platform. In that sense, Facebook can be seen as a social media platform that also provides data about the identity of its users in a transversal way. Parties like Amazon and Bol.com, on the other hand, in addition to carrying their own product range, also trade third-party products. In that sense, they are a retailer and platform all in one. All these examples show that various types of value exchange between actors can be facilitated on one platform. In fact, that goes for most platforms in their attempt to meet demand from different users. Platforms can take on different appearances at the same time with the aim of increasing revenue.

Table 5: Some well-known platforms and the categories to which they belong

Platform	Actor X	Actor Y	Actor Z	Type	Transversal, longitudinal
Uber	Passengers	Cab drivers		Exchange + payment	Longitudinal
eBay	Buyers	Sellers	Advertisers	E-commerce + payment	Longitudinal
Skype	Callers	People receiving calls		Exchange + payment	Longitudinal
Netflix	Viewers	Producers (including platform itself)		Media + payment (+ producer)	Longitudinal
Amazon	Buyers	Suppliers (including platform itself)		E-commerce + payment (+ retailer)	Longitudinal
Amazon Pay	Payers	Payees		Payment (transaction)	Transversal
Facebook	Users posting content	Users reading content	Advertisers	Social media	Longitudinal
Facebook login	Users that are also users of "other platforms"	"Other platforms" whose users are also Facebook users		Identity (transaction)	Transversal
PayPal	Payers	Payees	Other platforms	Payment (transaction)	Transversal

Table 5 contains examples of platforms from the previous chapter. For each platform, we have indicated the type as per our typology, and whether it is a transversal or longitudinal platform. We see that platforms often provide a clever combination of different functions, like a digital Swiss Army knife that is used to solve different problems for their user groups.

CASE

The B2B activities of Amazon

We have referred to the many kinds of platform propositions Amazon offers quite a few times already. Using the distinction between transversal and longitudinal platforms, we can now dissect a platform like "Amazon" so as to understand the relationship between the different elements. First of all, there is Amazon.com—Amazon as a longitudinal e-commerce platform—but with Amazon Services, it also organizes the buying process for others. Amazon Pay and Amazon Global/Prime, on the other hand, are transversal platforms that are used by other platforms in their buying process. A recent development is that the major platforms open up parts of their infrastructure to others, as so-called cloud services, like AWS, Microsoft Azure, and Google Cloud. Aliyun is a similar service provided by Alibaba. All the major platforms have had to make their infrastructure scalable for their own volumes, which allows them to accommodate other parties as well. For example, in terms of computing power, storage capacity, and database services as-a-service. They are regular, one-sided, B2B services that Amazon and Alibaba themselves provide to third parties, which means that Amazon and Alibaba themselves are one of the two actors in the transaction; they are the seller (actor Y). Figure 26 shows that the lower layers of the platform stack can also be seen as a transversal platform. With transversal platforms, then, value is reused in a specific process "step" or platform "layer." The *platform stack*, with its layers, is discussed in greater detail in the Design Section.

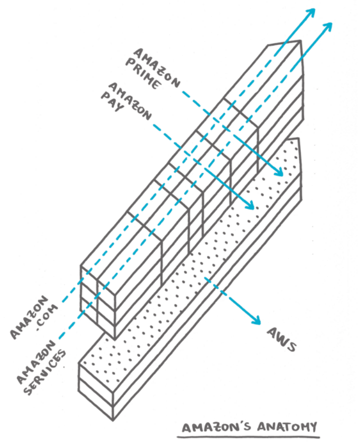


Figure 26. The platform anatomy of Amazon.

3.4 The Platformation of the Buying Process

As a result of digitization, the relationship between each random buyer and seller has changed. On the one hand, consumers are becoming more powerful, thanks to the increasing availability of technology. Using a few keywords, it is possible to have every imaginable product delivered to our doorstep at the lowest possible price.

> **Because we all buy on platforms, the sellers gain access to more and more data with which they can control the buying process.**

On the other hand, suppliers have access to more and more data, allowing them to understand better—and respond to—what people are looking for. In essence, this is the platformation of the buying process as such—or of the selling process, depending on your point of view. To explain this, we return to the model for the buying process we discussed earlier. As we now know, each customer journey includes six universal steps: discovery, selection, agreement, payment, delivery, and customer care.

In Table 6, on the left, for each process step, typical activities that a potential customer undertakes to get to a purchase are described. On the other hand, the supplier will try as best it can to draw a potential customer's attention to its product or service. The supplier's activities that are aimed at making that happen are listed on the right in the table. Its aim is to create as many touch points as possible to influence the prospect's decision. Ideally, that will result in a transaction. The supplier will try to organize the process in such a way that the customer is satisfied and becomes a loyal buyer or user. Table 6 illustrates that platformation in full motion[12]. Every step of the buying process is supported by all kinds of platforms, which automatically means that both actors and the underlying platforms generate data that further steer the process. This is an important fact that we will discuss in detail in the next section.

Table 6: Platformation of the customer journey

Process step	Customer activities	Type of platform	Supplier activities
Discovery	Become aware of need. Search for inspiration. Search for information. Create a longlist. Evaluate. Create a shortlist.	Amazon, Google, Bing (media platforms). Shopzilla, NexTag, Choice (social media platforms).	Visibility. Discoverability. Accessibility. Appeal. User experiences. Performance. Functional elements.
Selection	Make a choice. Choose the basic product. Add possible complementary products. Evaluate the settings. Make a final comparison.	Amazon, eBay, Booking.com (exchange platforms). Shopify, Magento (software platforms).	Entry. Interface. Product range. Product information. Information about price and delivery. Wishlist favorites. Product comparisons. Shopping cart. Upselling, cross-selling.
Agreement	Carry out the choice. Confirm the choice. Fill in personal payment details. Check the final selection. Receive confirmation of transaction.	Amazon, CheapTickets, Walmart (e-commerce platforms).	Onboarding. Check-out entry. Check-out flow. Delivery information. Payment options. Conditions & services. Opt-in. Fraud detection.
Payment	Authorize payment. Make payment.	PayPal, MasterCard, Visa, China UnionPay (payment platforms).	Receive and reconcile payment.
Delivery	Receive order confirmation. Track & trace delivery. Receive or collect product. Unpack. Test and evaluate.	DHL, Deliveroo, Google Express (delivery platforms), Amazon.	Packing. Order confirmation. Tracking & tracing. Delivery. Unpacking. Returns.

3.5 Strategic Business Models

For every platform, there has to be a substantial adoption among large groups of users in the market in order for the solution being provided to be interesting. That critical mass is important for nearly all the services that platforms provide, whether it is dating, paying, or booking a trip. The actors want to be able to interact via the platform; that is why the platform is there. A middleman with the ambition to start a platform business, and who has outlined the proposition they have in mind, has to make an important strategic choice: does it want to set the standard, like the "GAFA" (Google, Amazon, Facebook, Apple) or "FAT-BAG" (Facebook, Amazon, Tencent, Baidu, Ant, Google)[13] do with their platforms? Or does it want to develop the standard within a network of similar suppliers, like banks and telecom providers do? The former is known as the hub model, the latter as the network model. In the first chapter, we briefly discussed these two generic models. In this section, we take a closer look at them.

Hub Model

In the *hub model*, the middleman decides to service the market itself and to build its own reach. The aim is to maximize platform growth and maintain control of the process. As we saw earlier, that is easier to do when the proposition is symmetrical, in which case the middleman only has to attract one type of user. This user can then automatically interact with other users, with the same proposition offering functionality for both sides. An example is posting and reading messages on social media. When sufficient reach has been created, additional—asymmetrical—propositions are often developed to monetize that reach. In that case, the platform provides a new user group with access to the original user group, which is of interest to the new user group because of its volume. That is why the new user group is willing to pay for the proposition, for instance, the advertisers on Facebook. The hub model can be viewed as the platform approach in its purest form.

This strategy is also known as the *three-corner model*. As mentioned earlier, this refers to the roles of the various parties, which are the middleman who provides the platform, plus the two actors who are being facilitated in their mutual interaction.

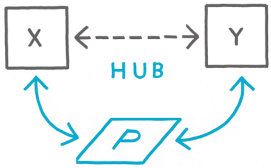


Figure 27. The hub model.

Middlemen who adopt the hub model service the two actors themselves and, as the central party, they control the entire process. They have an agreement with both parties for the services they provide, and they set the conditions on which the two types of actors interact with each other. The rules of the interaction itself are part of the agreement that is drawn up between the actors. So, there are three roles and three relationships in a triangle. Data move along those relationships, as we will see in the *data triangle* in Chapter 4. Google (with the exception of Android), Facebook, and Twitter, but also American Express, are iconic examples of platforms operating according to the hub model.

Exogenous competition

The decision to adopt the hub model has far-reaching consequences. If a middleman uses this approach, it competes with other suppliers at a platform level, in what is known as *exogenous competition*; this is competition that lies outside of the platform, between platforms. The reach of a platform is part of its competitive edge, and that can lead to fragmentation. Fortunately, they have users on both sides of the market who can engage in multi-homing by registering with multiple platforms. After all, they can choose from multiple platforms that all offer more or less the same things. This is an option if it does not cost too much money and effort to register on multiple platforms.

In the physical world, that is relatively simple. Families can decide to visit the local shopping center on a Saturday morning or choose a similar alternative, with a different owner, on the other side of town. It's their choice. That also applies to the other side of the market: shopkeepers can also *multi-home* by opening a store in both shopping centers. If we apply that principle to the digital domain, the following picture emerges. The owner of a laptop can, for instance, select a laptop with macOS by Apple and a desktop with Microsoft Windows as its operating system. It can run Adobe applications on both computers because on the other side of the market, software developers have the option of developing applications for both platforms.

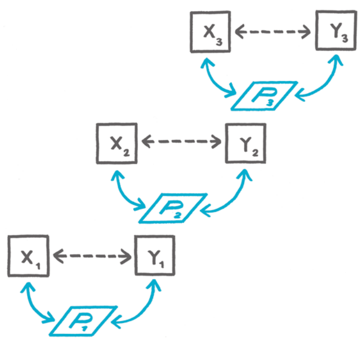


Figure 28. Hub model: competition at platform level

When does the hub model work?

The hub model can be particularly effective when a market is new, or where there is still untapped market potential, allowing for the creation of the rules on the spot. A middleman who creates such a market has the opportunity of shaping and securing that market for itself. This is also known as a *blue ocean strategy*[14]. Every middleman has the ambition to become as big as possible. "Mine is bigger than yours" is the most important unique selling point (USP) for platforms such as Facebook and Google. Scale and reach are what it's all about. That is evident as the accumulated reach is used to create added value, which is the basis for paid asymmetrical propositions that can be added later for new target groups; for instance, the advertisers for both of these platforms. Initially, it is especially the size of the platform that determines its value, with the aim being to monetize it at a later stage.

Even when customers benefit from the supplier having a large market share, it makes sense to compete on reach: the bigger the market share, the greater the added value for the customer—and for the company. That is the case, for example, for the users of platforms like WhatsApp, Skype, or PayPal. The greater the number of users they can potentially interact with, the more interesting the platform will be for them.

> **When comparable platforms exist side by side as hubs, users on both sides of the market will start multi-homing, provided it is not too expensive.**

The hub model is especially effective in countries with large, homogeneous home markets, where platforms can scale quickly. When a platform is successful, network effects will continue to do their work. Ultimately, that can lead to a situation where one platform dominates the market, with all users being serviced by that powerful, central party. The advantage is that the solution being offered will be the de facto market standard, through which it is easy for a large share of the actors to interact.

An important disadvantage in that scenario is that such a monopoly is at odds with the principles of free competition. It can lead to abuse of power, followed by interventions from regulators. As we discussed in the previous chapter, Microsoft had to deal with the European Commission in the past, and now it is Google's turn. In addition, the question is whether a monopolist will benefit from being in that position in the long run because innovation is not by definition, encouraged. Microsoft completely missed out on the market for mobile operating systems by marketing Windows Phone at a time when iOS and Android had already established a dominant position.

Needless to say, reach alone is not enough for a platform to thrive. To assume a leading position, the service being offered has to meet certain quality requirements. There will always be suppliers offering niche positions, premium products that appeal to select groups of customers who are willing to pay extra. Nevertheless, the big mainstream parties have an enormous advantage over smaller players. Initially, Microsoft's product was not the best option, but the company won anyway. Thanks to its dominance, the company had so much money at its disposal that it could buy whatever it needed to upgrade its product. Innovation was also bought, allowing the product's quality to improve over the years and the company to consolidate its position. That is reminiscent of the classic example from the video system market, where VHS emerged a winner despite its product being inferior to Sony's Betamax and Philips' Video 2000. By immediately publishing a large number of movies, the VHS solution became useful to a large group of people at once. The story goes that Philips refused to publish porn titles and that their qualitatively superior system thus failed to secure the necessary quick adoption[15]. The strategy of focusing on reach before quality in an attempt to maximize revenues can be a very effective one.

The hub model is a relatively common model because it is fairly easy to start on the basis of the "winner-takes-all" principle. However, only a few are successful, the result being fragmentation, which in itself does not have to be a problem if the use of multiple solutions at the same time is possible through easy onboarding and free use. However, when the costs then start to increase, the fragmentation can lead to market stagnation. In this case, the network model provides a useful alternative.

CASE

Alibaba and WeChat: the impact of scale

Successful platforms operating on the basis of the hub model mostly appear to originate from the USA. The large home market and the limited legal fragmentation provide ideal circumstances for realizing a huge reach quickly. That it can be even bigger is proven by a country like China, which has the world's biggest Internet market. This is understandable, with almost 1.4 billion people, in combination with a government that carefully regulates the market and subtly shields it from foreign competition. Internet companies like Alibaba, JD.com, Baidu, and WeChat thrive under those circumstances. In this section, we discuss two of them, Alibaba and WeChat.

Case 1: Alibaba

Alibaba is China's version of eBay, Amazon, and PayPal all rolled into one. It was founded about twenty years ago by former teacher Jack Ma. He collected 60,000 dollars from seventeen supporters and used it to start the first branch of Alibaba: Taobao, a kind of eBay without a bidding system. Two years later, investment bank Goldman Sachs and the Japanese Softbank conglomerate decided to invest in the initiative, allowing the platform to grow. That worked well. At the company's IPO, it was worth 206 billion US Dollar, making it the biggest IPO ever in the history of the New York Stock Exchange. Via brands like Taobao and Tmall, over 420 million active customers have access to a segmented marketplace with over 10 million shops. The combined market share of these shopping platforms is about 80%[16].

In addition, Alibaba has its own payment service, Alipay, which is similar to PayPal. The system offers sophisticated escrow services, with which consumers can first decide whether or not they are satisfied with the goods that have been delivered, before transferring the money to the seller. With over 800 million users, Alipay is the biggest digital payment system in the world, and it is considered to be Alibaba's crown jewel[17].

Alibaba's revenue model is very different from that of a platform like Amazon. Alibaba operates much more like a genuine platform that brings buyers and sellers together instead of posing as an e-retailer as well. As middleman, Alibaba makes money by charging transaction fees and above all via advertisements that traders place on the sites. The success of Alibaba rests on three pillars: Jack Ma foresaw the growth of both small and medium-sized companies as the potential of e-commerce in China, and responded effectively by not charging the initially reluctant merchants a fixed fee for the use of the platform, but allowing them to pay a fee for each successful transaction. Alipay itself generates enough trust to persuade people to allow transactions to proceed[18]. In addition, Alipay provides credit to entrepreneurs on the basis of its own rating system, Sesame. Today, the conglomerate consists of a huge wheel of platforms, where buyers and sellers find each other above all via mobile devices. By now, turnover has far exceeded the level of eBay and Amazon combined.

Case 2: WeChat

The Chinese mobile messenger service that we know as WeChat—Weixin in China—also is a large-scale success[19]. The platform was started in 2011 as a new initiative by Tencent, an online gaming and social media company, and had approximately 1,3 billion users in 2022. What is the secret? WeChat enables all daily contacts with the world, from first thing in the morning until last thing at night. It is easy to run a business with the app, thanks to services like free video calls, instant group chats, and the ability to share large files. The app also has lots of features for non-business use, including online shopping, paying at physical stores, saving credits, processing discounts, paying for cab rides, and booking trips—all inside the WeChat universe.

On top of that, the app is fun to use. For instance, by waving your smartphone around, you can make new friends who are also connected to the platform. And by waving in the direction of your TV, the app can connect to the program being aired. WeChat is seen as a harbinger of the classless economy; many Chinese people use the app all day for transactions, without having to use a payment card or cash money. Half of all online payments in China take place via smartphones. In the USA, it is only a third. WeChat has managed to persuade more than half of its users to create an online wallet, thanks to their trusted brand, which is deeply embedded in people's daily routines. A successful marketing stunt also helped. It is a tradition in China to send cash money to friends and relatives in a red envelope to celebrate the New Year. In 2016, WeChat launched the "red packet" campaign, allowing people to do so digitally. It worked: more than 400 million users sent each other a total of 32 billion packages of digital money. That is 80 per user!

Network Model

Middlemen can also decide to adopt an alternative approach in the form of the *network model*, also known as the *four-corner model*. In that case, they don't operate completely independently but, to an extent, work together with similar suppliers who all add their reach to the collaboration. An important advantage is that the intended solution is made available to large groups of users, without having to make all the effort required oneself. This also generates network effects.

Let's go back for a minute to the theory from the first chapter, where we argued that, in the network model, the intermediary role is decentralized. This role is split among multiple middlemen working together on the same core functionality so that the interaction between two actors is facilitated even though they are connected to different suppliers. An important detail is that the middlemen do not have direct access to each other's users; it is always indirectly. There are no diagonal connections: each of the actors is serviced solely by their own provider and with their own agreement. The two providers in turn also interact on the basis of a mutual agreement, same as the actors. So, there are four roles and four relationships in this four-corner setup, with the data only moving along those relationships.

More about this in Chapter 4.

Both of the intermediary roles that are needed in an exchange can be performed by multiple platforms, and one platform can still play both roles. As a result, user groups on both sides can choose from multiple providers in the network and still interact with each other, regardless of the platform to which they are connected. These networks are open to providers that commit to following the rules for taking part in the network. We call them *participants*. The rules that apply within a network are laid down in a *trust framework*.

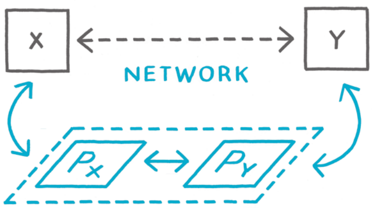


Figure 29. The network model.

Telecom companies are a good example of this approach. Sometimes they facilitate the initiation of a call (*call origination*), other times they facilitate the reception of a call (*call termination*) that may have been initiated by a competing company. The companies have agreed on that system to create a large shared reach.

When the network approach is successful, the added value for the shared customer base increases. In the telecom sector, special organizations were created to develop and safeguard the necessary standards. For instance, the International Telecom Union (ITU) makes it possible, among other things, for international telecom networks to be connected, while the GSM Association (GSMA) looks out for the interests of the global mobile operators. The Universal Postal Union (UPU) plays a similar role in the international postal market.

The network model is also widely used in markets like the credit card and online payment markets. Later in this chapter, we will discuss how that works. It is important to note that the network model poses an additional challenge with regard to the rights and obligations surrounding transaction data. In this case, the middlemen usually do not facilitate the complete interaction between the actors, but only one part. This means that contractually speaking, they own only "half" of the data resulting from a transaction. If the data is then provided to third parties with the consent of only one of the actors, this creates quite some problems, especially within the framework of the GDPR.

Endogenous competition

In the case of the network model, reach is not part of the competition. In fact, the aim of the collaboration is to maximize the combined reach. In the case of the network approach, middlemen face competition from within the network to which they are connected, so-called *endogenous competition*. The participants within the network compete on service quality and price, but not on network size as this is the same for all participants.

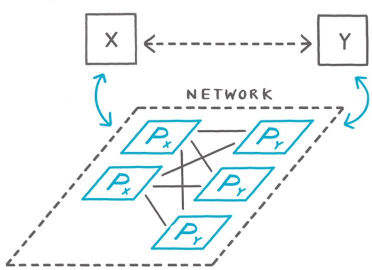


Figure 30. Network model: Competition within the network, between participants

DEEPDIVE

Collaborate or not: the "prisoner's dilemma"

The core question when setting up a platform is: when do you choose to collaborate and when is it better to go it alone? That question has become much harder to answer in today's digital economy where nothing is certain, and participants continuously innovate, play different roles, and create new markets all the time. In order to decide, it may be of help to use the rules of game theory as a starting point. In game planning, there are two extremes. In the first version—the "zero-sum game"—two companies are engaged in a fiercely competitive battle, and only one of them can ultimately survive. One company's profits directly affect the others'. On the other end of the spectrum—the "non-zero-sum game"—there are numerous players that each approach the market with their own plan. This is a situation where one man's profit doesn't necessarily mean another man's loss. In this case, the profits and losses of everyone involved do not add up to zero. In other words: everybody can win, and working together leads to a win-win situation. Most markets are somewhere between these two extremes in the spectrum.

The prisoner's dilemma[20] is the classic example of a non-zero-sum game. It involves two suspects of a crime who are being interrogated separately. Depending on how they act individually, their punishment is either zero or ten years in prison. That is why it is better for the two suspects to work together, in this case, by staying silent; in which case they will both get a fine. However, if one of them confesses, but the other doesn't, the suspect making the confession has a considerable advantage. They will be released because they cooperated, while the other person goes to prison for ten years. Or they both need to confess, and will each be sentenced to five years in prison as Table 7 shows. However, for that to happen, they have to have an equal amount of trust in each other. Every middleman is faced with a kind of prisoner's dilemma and will constantly have to weigh the pros and cons of collaborating versus going it alone. In the case of a pure hub model, collaboration is kept to a minimum. The zero-sum game does its work: it's all or nothing. The parties competing for a leading position only have to do one thing: battle each other. If that results in a monopoly position, the winner will reap enormous profits for a while. A network model is a better option when working together has clear benefits. This is the "non-zero-sum game," where all the participants can win, and when one of them grows, that doesn't have to be at the expense of the others. When markets are too fragmented to function well for most of the actors, the network model may offer a solution. In such a situation, all the individual platforms will find it difficult to realize sufficient scale, which means their added value for users is insufficient, and their activity is not bringing the expected profits. Working together and "growing the pie together" then is the logical answer.

Table 7: The classic prisoner's dilemma

	I stay silent	I confess
The other stays silent	Both pay a fine	I am free
The other confesses	I get ten years	I get five years

Applied to platforms:

	I hub	I network
The other hubs	Both a chance of all or nothing	Me a smaller chance of all
The other networks	Me a greater chance of all	Develop and share a bigger market together

> **The network model can offer a solution for platforms in heterogeneous and fragmented markets.**

The power is divided among the network participants on the basis of their internal market share. The more successful a participant is in organizing the quality of their propositions, marketing, and delivery to end users, the bigger their share within the network will be. In addition, users benefit from the growth of the overall network, due to the increased pressure on the platforms to translate the economies of scale into price reductions with which to distinguish themselves from the competition. Again, the more dominant a participant is within the network, the better its position to pass economies of scale onto its customers. From a liberal economic perspective, the advantage of this model is that there is less risk of a monopoly, in contrast to the hub model.

What is essential with the network model is to determine the level of collaboration within the network. The secret is to work together on non-competing elements, the *collaborative* or *cooperative domain*. Infrastructure, standards, brand marketing, certification, etc., are typical elements of that collaborative domain. Additional services, pricing, service level, and support, on the other hand, are usually part of the competitive domain.

When does the network model work?

Collaboration seems like a logical strategy when a number of smaller companies try to service a market independently, each with their own solution. However, in practice, it often does not work like that. What if each player thinks like an independent platform? What if they all think they can become the biggest and then squash the competition? That would make working together more difficult, especially when a middleman, full of ambition, just launched its own network. However, if, after years of sweat and toil, the individual players jointly conclude that nobody can be the winner and that the market as a whole is lagging, the time may be right to discuss a collaborative model. Ultimately, it is better to have a small share of a big pie than a big share of a small pie.

In which situations does a collaborative model have the greatest chance of success? The answer is, in heterogeneous markets that are characterized by a high level of cultural and legal diversity, in highly fragmented markets, and in markets where multi-homing is expensive and impractical for the user. Services with a relatively heavy onboarding process, like payment, identity, and billing, often result in fragmented markets. That can be explained by the fact that scaling those kinds of services is more difficult, which, in terms of time, leaves more room for competition.

The hub model is far more difficult in a heterogeneous market (in contrast to large, homogenous markets, where this model allows for quick scaling). Markets that consist of smaller sub-markets, like Europe, South America, or parts of Asia, almost by definition lead to fragmentation. For companies operating in those markets, it is almost impossible to create reach and scale before being able to provide an alternative solution to a competing platform that did start from a large homogenous home market. For parties operating in these fragmented markets, the network model may provide an alternative because it will give the collaborating middlemen access to each other's customers and allow them to create the necessary scale together.

Finally, individual platforms can come to a certain level of collaboration when it is difficult for end users to multi-home and be active on multiple platforms simultaneously.

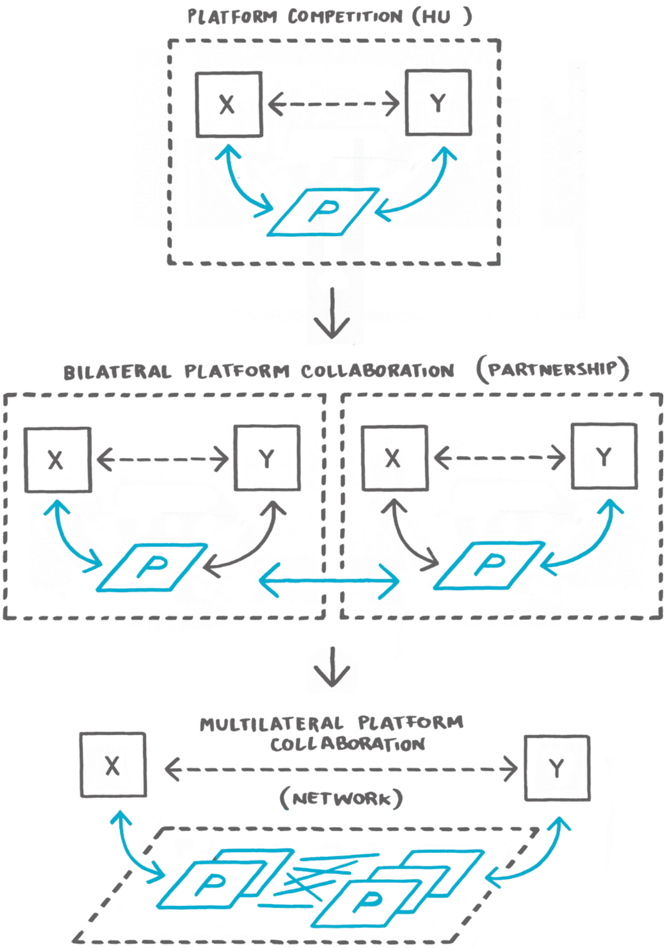


Figure 31. Evolution of unilateral hub model, via bilateral partnership, toward multilateral network model.

This is the case, for example, on the payment and billing markets, where multi-homing is difficult because of the elaborate onboarding processes. These force platforms to implement complex Know Your Customer (KYC) procedures, among other things, in order to prevent money laundering and fraud, as well as integrating various systems. From a user perspective, platforms operating in those markets are more or less forced to work together in some way. Before the iDEAL platform was introduced in the Netherlands, for example, the Dutch online payment market was highly fragmented. Initially, the country's major banks each attempted to create a platform of their own according to the hub model. After a few years of struggling, it turned out not to be profitable for any of them and they became more open to the network model as the only way to increase the size of the pie for all of them. In 2004, this resulted in iDEAL, a solution where the consumer uses their online bank to make a direct payment to a webshop. It was a huge success. It enabled the e-commerce market in the Netherlands to grow quickly and soundly; something that no one expected to happen to the extent that it did.

In terms of timing, there are three possible moments at which collaboration can start: parties work together from the start, when the market gets stuck, or when an external party—such as a trade organization or government—intervenes to get things moving or set things straight.

> Collaboration is in the DNA of sectors such as logistics, telecom, and banking because it is the only way they can provide their services globally.

Some markets have collaboration in their genetic makeup, such as telecommunications, logistics—including the postal service, and banking—including payments. Working together is in the DNA of those sectors because there is no other way. To provide their services on a global scale, countries and middlemen simply have to work together. When actor X (with middleman A in country one) wants to interact with actor Y (with middleman B in country two), a certain level of collaboration is always needed between the countries and middlemen.

When middlemen do not work together, end users use their services less or not at all. A telecom provider where you can only call the subscribers of the company itself is unthinkable, as is a scenario where you can only pay the people or companies who have an account at your own bank. With these types of services, it is crucial for users to have "universal reach" to facilitate "many-to-many" interactions. They want to be able to interact with everybody, regardless of which provider they or their counterparts use. Telephony is an example of a market where collaboration was forced by regulation. In many countries, incumbent telecom operators enjoyed monopolies for years, but in the 1990s, regulation in different countries slowly opened up the market to other telecom providers, allowing them access to the existing infrastructure.

Mobile payments and electronic invoicing, finally, are fragmented markets where third-party intervention is desirable. A basic level of collaboration is necessary. If many providers keep operating independently, all solutions that are on offer are bound to be suboptimal. In both cases, a standard solution would provide the market with a major boost. Often, it is up to the government to intervene in these cases. However, in practice, it is not simple to persuade various parties in the market to consider entering a strategic cooperation. The T.R.U.S.T. framework can help shape that process. It is an effective tool with which platforms can be created according to the hub model or the network model.

More about this in the Design Section.

CASE

How to get a market that is stuck in motion? The example of e-invoicing

In many markets, a solution needs to have sufficient scale to be effective. That is the case, for instance, in the payment market. Ultimately, everybody has to be able to pay everybody else. To make that happen, the players have to realize some kind of collaboration, which quickly brings us to the network model. This also applies to other markets, for instance, when they stagnate due to fragmentation and the stakeholders are unable to solve things among themselves. In some of those cases, the government has to lend a hand. One example of such a market is e-invoicing or electronic invoicing. At many Dutch companies, as in companies elsewhere, administrative staff fill their days with ironing out wrinkles that result from incompatible invoicing systems because they need to make sure everything is in order. The first challenge in organizing e-invoicing is that nobody wants to pay for receiving an invoice, which means that the sender will have to pay the costs. It has to set up the invoice, send it, and get it into its client's financial administration, preferably in such a way that the client will want to pay immediately. At the moment, there are dozens of companies offering their own e-invoicing platforms on the Dutch market, among them some relatively large parties, like OB10, Basware, Ariba, and Tradeshift. Typically, an e-mail with a PDF invoice attached is the highest attainable solution. In a sector like this, where important legal and fiscal interests play a role, that is an undesirable situation.

In 2012, the Dutch government supported a market initiative to create a network of collaborating e-invoicing suppliers with which senders and recipients could reach each other more easily. It was set up in a way similar to other markets that work with a common standard, like telephony and e-mail. This resulted in the Simplerinvoicing network[21], which a growing number of e-invoicing providers have since joined. After e-invoicing became mandatory for the Dutch government in 2018, it is expected that adoption will take off on a large scale. When the providers work together in a network, the senders and recipients of e-invoices only have to worry about the quality of the services being provided, not about the question of whether or not a certain party can be reached via their system. All customers of the individual platforms can be reached via the network, similar to phone calls or e-mails. The total benefit for all users of the companies taking part in the network is considerably greater with the introduction of a network model.

3.6 Summary

Here are the main considerations regarding platforms for different markets.

- For anything you can think of, whether it be a guest bed or a cab ride, a platform has been, or is being, built. A trend that we refer to as *platformation*.
- Large-scale digital platforms reorganize the chain and claim the profit margins that used to be divided among multiple intermediate links, largely for themselves. The end of the *smiling curve* is in sight.
- There are five types of digital platforms that play a role in the buying process: *software platforms, exchange platforms, e-commerce platforms, media platforms,* and *transaction platforms*.
- Transaction platforms make digital transactions possible. Within this category, we distinguish *payment platforms*, and platforms that organize the trust users have in other users, *identity platforms*. This category also includes methods that allow payment methods other than money.
- Another possible distinction is the "direction" in which a platform supports a chain. Middlemen who operate a *longitudinal platform* facilitate one, multiple, or all the steps along their value chain. *Transversal platforms* are platforms that have accumulated value that can be reused by other platforms, like payment platforms, identity platforms, or *cloud* platforms. They operate perpendicular to other value chains.
- Every middleman has to make an important strategic choice when developing its platform: does it want to set the standard independently in a *hub model*? Or does it want to work together with similar providers, in a *network model*?
- Middlemen using the hub model service both interacting users themselves. As the central party, they control everything. In this scenario, there is *exogenous competition*, which means competition takes place between platforms. In case of success,

as a result of economic optimization, only one provider may survive, and that becomes the market standard. Such a monopoly may result in abuse of power and stand in the way of innovation.

- Platforms, according to the hub model, match nicely with *blue ocean strategies* or large *homogenous* markets. The hub model can also work in situations where multiple similar service providers can co-exist, and users on both sides of the market have options—without affecting the benefit of such services.
- When multiple middlemen work together to service the two actors in an interaction with their proposition, that is known as the *network model*. User groups can choose between multiple providers in the network, and interact with each other, regardless of the provider they use. In that case, competition takes place inside the network to which the platform is connected, in what is known as *endogenous competition*. The participants compete with one another in terms of service and pricing, but not in terms of network size.
- This model can be very effective in heterogeneous or fragmented markets, or in markets where *multi-homing* is difficult for the end users, for instance, when the costs of onboarding are high. The considerations for collaborating strongly resemble the classic *prisoner's dilemma*: collaboration offers the best chance of a good result for both parties.
- When collaborating in the network model, it is important to separate the *collaborative domain* from the *competitive domain* clearly. If there is not enough room for competition, price is the only thing companies can compete on. If there is too much room for competition, there may not be sufficient benefit to collaborate in the first place.
- Markets that start with multiple *unilateral* hub models can, after a period of *bilateral* partnerships between some hubs, evolve into a *multilateral* network model.

How Do You Design A Platform?

Introduction

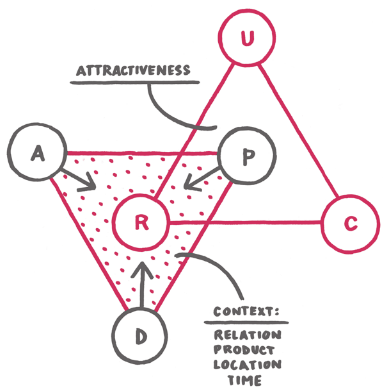
This part of the book provides practical tools in the form of two work models that can help middlemen design their platforms. The models can be used in practice, but also help to shed light on the theory discussed in the previous chapters. How do platforms work, and what is involved in building one? How does a middleman create a proposition that mitigates the perceived risks of the actors by embedding sufficient trust in its platform, so that both user groups are willing to enter into interactions and transactions?

In the first part of this Design Section, we discuss the *Transaction Context Model*. This includes four risk factors that determine the actors' experiences in a transaction and that, as such, determine the usage of intermediary platforms. The model can help identify the most important risk factors in transactions in order to create propositions that provide enough trust between the actors. This is an important condition for running a platform because, as we know: no trust, no transactions.

The second model discussed in this section is the *T.R.U.S.T. Framework*. This includes five main interrelated dimensions that play a role in designing and building a platform. They can be used to address the risk factors systematically. Whether a platform is built in accordance with the hub model or the network model, the T.R.U.S.T. Framework provides effective guidance.

Both models discussed in this section originate from the consulting practice of INNOPAY, where they have been applied since 2003 in large-scale, two-sided market projects in areas such as payments, identity, public transport, invoicing, and data sharing. The models are under continuous development by integrating new and advancing insights.

1. The Transaction Context Model



> **The Transaction Context Model presents the most important factors for coming to a transaction.**

The Transaction Context Model[1] presents the most important factors for making a transaction happen. It shows what the risk areas are for both actors. In other words, what are some possible reasons for a buyer or seller not to go through with a transaction? When a middleman or provider has a clear picture of this, they can do what needs to be done to remove potential obstacles. The starting point is that the actual behavior of buyers and sellers is the leading factor. That behavior is, to a large extent driven by the risk that they both perceive, and, for both, each step of a transaction— agreement, payment, delivery—involves a certain measure of risk. At every step along the way, things can go wrong. That risk is felt even more clearly in the digital domain when there is more room for risk unless the middleman who facilitates the transaction takes the necessary measures on the basis of the T.R.U.S.T. Framework.

I.1 The Four Context Factors

In our consulting practice, we have extensive experience with transactions in all shapes and forms for a wide range of clients. That rich experience has allowed us to determine the areas where actors perceive risks when it comes to transactions. These are determined by the four situational factors: *relationship, product, location,* and *time.* These factors are fixed and cannot be influenced. We call combinations of these factors the "transaction context." There are countless possible transaction contexts that each create a certain risk perception among the actors involved. In other words: the perceived risk varies with each transaction.

It is up to the middleman to have a thorough understanding of the transaction context and then to make sure that the risks are acceptable to every actor it serves. It does so by organizing its processes as optimally as possible. When that works, conditions have been created for the trust that is needed for the transaction and platform.

> **This brings us to the "1-2-3-4 of transactions": one transaction takes place between two actors who complete three processes together in a context consisting of four factors.**

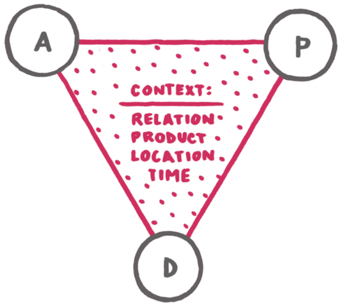


Figure 32. The four context factors of a transaction.

Figure 32 shows the sub-processes—agreement, payment, and delivery—which together make up the transaction trinity. The three processes are inseparably connected, and a transaction is finalized by completing all three processes. However, each process carries certain risks for each party. If the risk is too high, one of them will not follow through with the transaction. The risk level is determined by the four context factors that can vary with each process. Especially, when there is a serious perceived risk, a middleman can provide a clear added value, provided it manages to mitigate that risk with trust. For instance, think of the success of Airbnb, where homeowners don't hesitate to rent their homes to total strangers because the platform has managed to create the right conditions. But also, on platforms like Rakuten or eBay, most people pay well in advance to receive the products they ordered. How do the four context factors affect the perceived risk during the three processes of a transaction? Let's examine them one by one.

1. Relation

Each transaction by definition involves two actors with a certain relationship toward each other, as a result of their (repeated) mutual interactions and transactions. The nature of that *relation* between the buyer and seller in part determines the risk the two of them experience during a transaction. Are they both anonymous, do they know each other, or are they familiar with each other? Earlier, we stated that there has to be trust before a transaction can take place. For that, the actors first have to know who they are dealing with. The less well they know each other, the greater the perceived risk. When that is the case, the middleman has to remove the risk; for instance, on the basis of its reputation: what do others think of this individual or company? Based on the assessment of others, the actor can then determine whether or not to do business with the party in question. Marketing plays an important role in this respect; consider, for instance, the reviews and ratings that are used on many platforms.

> As more and more interactions and transactions take place, the nature of the relationship changes, which can lead to additional transactions.

The nature of the relationship changes as more exchanges take place. When parties decide to interact, and they are both happy with the exchanges, this can lead to repeated interactions and ultimately, transactions. A buyer can request information from a provider, and when that interaction is satisfactory, it may decide to take the next step in the customer journey. The greater the number of positive experiences, the quicker the trust between them will grow. That goes both ways: a high level of trust is more likely to lead to repeat transactions, and repeat transactions will further increase trust, in a self-reinforcing cycle of trust and transactions. Loyalty programs also help create trust between actors, since they stimulate the interaction between buyer and seller. Again, the higher the number of touch points, the more trust can grow, and the "deeper" the relationship will be.

2. Product

The essence of every transaction is that there will be a payment and a delivery. To what extent do both parties experience risk with regard to what is being exchanged? For the buyer, it is the delivery; in other words, the product or service for which it pays. The seller can experience risk with regard to what it gets in return, the payment. This can be money, but data are also increasingly used as currency. When there is insufficient trust in that regard, there are risk factors that a middleman has to identify and then resolve. In practice, influencing the money part of the transaction is complicated because currencies and regulations are the concern of governments and central banks; this is the reason why we focus on the uncertainties buyers can experience in relation to the *product* itself.

> Each product carries certain risks, and the better a middleman is able to map them, the more effective the solutions will be that it can implement.

The level of risk, in this case, is directly related to the nature of the product. Is it digital or physical? Liquid, fragile? Is it easy to determine its quality based on a picture? What is its value? Is it easy to re-sell the product, making it a potential target of theft? Each product carries certain risks, and the better the middleman is able to map them, the more effective the solutions will be that it can implement. For instance, a bookstore owner will operate differently from an Ace & Tate store owner, who sells eyeglasses online. Where a person buying a book usually knows what to expect, buying a pair of glasses tends to be more complicated because it has to look good as well as have the right prescription. Ace & Tate removed that threshold by allowing all customers to return new glasses within 30 days, no questions asked. Each product has specific risks that have to be covered. A rare second-hand book, the latest model smartphone, or an illegal weapon: they all have their own risk profile during a transaction.

3. Location and distance

The third factor that determines the level of risk that each buyer and seller experiences during a transaction is the *location* of and *distance* between the actors. Where does the transaction take place? This information determines the social, cultural, and legal setting within which they do business. We all understand that buying something at a bazaar in Tunisia is different from visiting the local market. All countries have their own culture where trust is more or less embedded at a social level. In addition, they have their own jurisdiction that is explicitly stated in most contracts. These are all potential risk factors that are related to the location.

The physical location where a product has to come from can also literally be remote; for instance, when a German buyer orders a gadget via a Chinese platform like DealExtreme. The same uncertainties apply. What can the buyer do if a product is not delivered or breaks down within a week? In other words, what is the legal framework for the contract, how is it protected? When it is insufficiently clear that a buyer can hold the supplier responsible, that is a risk factor that the middleman has to address.

Location also includes the sales channel that is used. Is it a physical or a digital channel? When the parties don't know each other, and it is hard for them to contact each other because of the distance, that generates additional risk. In that sense, buying a diamond from a total stranger on the other side of the planet creates a different risk perception than buying from a local jeweler. In both cases, the conditions need to be in place for the transaction to take place.

In short, physical distance creates uncertainty, and the middleman has to set mechanisms in motion to remove that uncertainty.

4. Time and timing

The time factor relates to the *time* and to the *timing* of the three transaction processes, which also affect the perceived risk. In an absolute sense, the time at which the transaction takes place plays a role. Is it during the day or in the middle of the night? Will delivery take place when the buyer is at home, or will one of the neighbors end up receiving the package? The order in which the three processes take place also turns out to be highly relevant. In what order are the steps of agreement, payment, and delivery carried out? Is the product delivered first and will payment take place later, or vice versa? What payment methods can be used? See also Figure 12.

Now that more and more transactions take place within the digital domain, greater variation in timing is possible, which means that there will be more asynchronicity. While, in the physical world, the entire transaction trinity often takes place in one location and in the presence of both actors, the same process is much less transparent in the digital domain. The three sub-processes—agreement, payment, and delivery—are separated, making it harder for both parties to verify the course of the transaction, creating uncertainty and, therefore, risk.

I.2 Risk and Risk Balance

For every actor who is involved in a transaction, the perceived risk is a function of the individual risks of the elements of the transaction trinity, all three of which are determined by the risk associated with the four context factors: relation (r), product (p), location (l), and time (t). However, that does not yet complete the picture because the total transaction risk is the sum of the risk perception of the buyer and seller. For both actors, it is the sum of the risk involved in all the sub-processes of agreement, payment, and delivery, while the four context factors play a role at every step of the transaction.

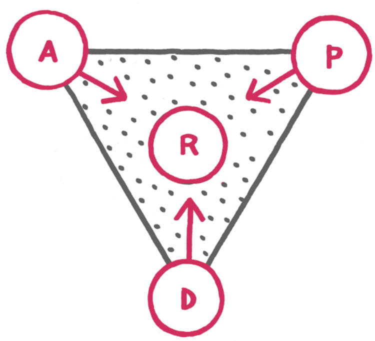


Figure 33. The three processes all contribute to the risk perception of both actors.

A summary of that yields the following formula, whereby X can be agreement (A), payment (P) or delivery (D), and T is the entire transaction.

$$R_x = f\,(R_r, R_p, R_l, R_t)$$

and

$$R_T = R_A + R_P + R_D$$

Based on the perceived risk, both the sellers and the buyers can select certain payment and delivery methods, which are acceptable to them, given the situation—to enable a transaction, there has to be a balance between the transaction risks of the buyer and seller. In that ideal situation, both actors will assess their risk as being acceptable, and they both decide to follow through with the transaction. We call that the *risk balance*.

If one of the two actors perceives a much greater risk than the other, that is known as a *risk imbalance*, and that is exactly where the added value of the middleman comes in. If it manages to clearly identify and then remove this imbalance in a credible way, it creates the trust that enables the two actors to do business. That is an important condition for conversion, which is the moment a buyer decides to buy a product or service. So, it is hardly surprising that this is one of the most important parameters for measuring the success of middlemen operating platforms and web shops.

> When a middleman is able to identify a risk imbalance clearly and then credibly remove it, it creates relevant added value.

Finally, a word about the impact of individual context factors. How do they relate to each other? Which of them plays the biggest role in the perceived transaction risk? Testing the model in practice showed that it was especially the context factor *time*, and, in particular *timing*, the "payment up front versus after delivery," that determines the way risk is divided between buyer and seller. In addition, the type of product plays an important role as well: products with a high value that are also easy to transport and re-sell, like electronics, cryptocurrencies, and phone cards are more likely to attract fraudsters, which generates additional risk for sellers. At face value, the factor location appears to be less important, but this includes the types of sales channels, which affect the relationship between the parties. There is a strong correlation between the Internet channel and anonymous relationships, which indicates that the Internet as location increases the perceived risk due to its relatively anonymous nature.

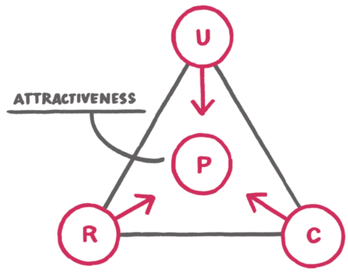


Figure 34. 3P model applied to payment services.

I.3 Risk Acceptance of Payment Methods

The context in question plays an important role in a transaction and, as we saw earlier, this determines to a large extent whether or not the buyer and seller are willing to engage in the transaction. When we take a closer look at payment methods in the Transaction Context Model, we can see that the payment proposition itself also plays an important role in its acceptance. How attractive is it, and on what does an actor base its assessment of it? The 3P model by Betty Collis[2] provides interesting clues. The model describes how an actor responds to a service and how it connects that service to its own motives, emotions, and experiences. This can be explained by the three Ps: *Profit, Practicability,* and *Pleasure*. Profit represents the usefulness of a given solution; the user must find it valuable in that sense. Practicability describes the extent to which the digital service is easy to use. And there is pleasure involved; for instance, when the user experiences a beautiful design or additional features.

When we translate the 3P model to the use of payment methods, we can identify the following factors. Practicability translates to usability. What is the quality of the functionality for the user—for instance, in terms of interaction and speed—and to what extent does it contribute to the merchant's conversion? Profit is interpreted as the costs that have to be incurred by buyer and seller. How do they relate to the benefits? Pleasure, finally, is expressed in terms of minimum risk. Under what circumstances is a certain payment method selected? This choice is an optimization of the factors *Risk (R),Cost (C),* and *Usability (U)* for the buyer as well as the seller.

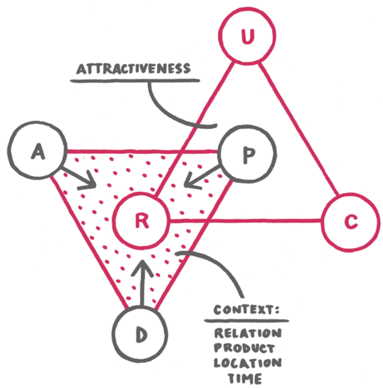


Figure 35. Framework for assessing a payment method.

If we then apply the 3P model to the Transaction Context Model, a framework emerges that shows how the behavior of the two actors is influenced. This makes it possible to determine the extent to which a payment method is acceptable to both actors in a given situation.

The chance of something going wrong in the process, the gravity of the possible consequences, and the effort required to make the payment together determine the actors' behaviors. Both actors will take these aspects into consideration. For instance, some products can be paid for by card, but not by direct debit, e.g., when buying an online lottery ticket. Direct debit would be risky for the seller because the buyer has the right to reverse the payment, even after the winner has been announced. With a card payment, that is not possible in this particular case, which is an advantage.

The assessment of a payment method in a specific situation is a delicate matter for both parties since costs and usability are weighed against the perceived risks involved. The provider will determine its risk on the basis of the context factors location, relation, and product, and will have to estimate the chance of losing the order as a result of the payment and delivery methods it has selected to offer. This results in a proposition with specific timing, minimizing its own risk, and at the same time offering an acceptable solution to the buyer.

The buyer will then have to assess its risk on the basis of the payment and delivery method being offered by the seller, trying to find the optimal balance between risk, usability, and costs. If the transaction ends up happening and results in payment and delivery, the buyer and seller have agreed on a mutually accepted division of risks, costs, and usability, and there is a balance. Table 8 provides insight into the considerations of the two actors.

The next question can be to what extent the assessment of the payment method by actors is affected by the context. This has been examined for a variety of situations. We list the scores for the different payment methods from the points of view of the two actors for two situations in Table 9. The first case involves the online purchase of a designer clock worth 199 US Dollar. The buyer registered first, so the seller knows who it is, and payment takes place prior to delivery. The second case concerns a CD worth 17 US Dollar, bought in a store, with payment and delivery taking place at the same time.

Table 8: Considerations in selecting a payment method

	Actor X (Buyer)	**Actor Y (Seller)**
Risk ("Pleasure")	Can the transaction be reversed? How secure is it?	Can the buyer reverse the transaction?
Costs ("Profit")	This depends on the agreement between the buyer and its bank. Often, the buyer pays no costs, which is part of the bank's proposition.	The costs of the bank per payment, plus other back-office costs to be able to offer the payment method.
Usability ("Practicability")	Is the payment method easy to use? Does it require registration? Is there mandatory authentication?	Is the payment method easy to use? Is the process fully automated, and is there good matching to the sales administration?

Table 9: Risk profile of payment methods in two situations

Situation 1: Online purchase of a designer clock of 199 USD

	Actor X (Buyer)			Actor Y (Seller)		
	Rb	Cb	Ub	Rs	Cs	Us
Bank transfer	--	+	--	++	++	--
Real-time transfer	--	+	++	++	+	++
Credit card	+	+	++	--	--	+
Automatic direct debit	++	+	++	--	++	++

Situation 2: Purchase of a CD of 17 USD in a store

	Actor X (Buyer)			Actor Y (Seller)		
	Rb	Cb	Ub	Rs	Cs	Us
Cash	+	+	+	-	-	-
Debit card	++	+	++	++	++	++
Credit card	++	-	++	++	--	++
Check	+	-	-	-	--	--

CASE

How risk perception affects the choice of payment method

The Transaction Context Model as described in this book was used as a starting point for a study into the effect of perceived risk in transactions for e-retailers, and how it helps determine their decision about which payment methods to offer[3]. The study was conducted in countries in Central Asia, the economies of which are in a transitional phase. Roughly speaking, the way the Internet purchases can be paid for in the countries involved, can be classified as shown in Table 10. The study confirms the relevance of the Transaction Context Model: if the seller experiences a higher product risk, it will choose a payment method with low risk, like a prepaid credit card, where the amount is deducted immediately. On the other hand, there is a negative correlation between product risk and adoption of credit cards, with payments taking place afterward and with an increased risk profile. The willingness to accept risk by the buyer also plays a role: when a relatively risky delivery method is selected, there is an increased likelihood that, when it comes to the payment method, a higher risk level is considered acceptable as well.

Table 10: Classification of payment methods according to medium and timing

	Payment in advance	Immediate payment	Payment afterward
Electronic	Online voucher, digital wallet, gift card, prepaid card, electronic purse.	Prepaid credit card (debit card), electronic bank transfer, payroll card.	Credit card, payment card.
Paper	Voucher, automatic collection.	Cash on delivery, payment at the post office, bank transfer.	Check, paper invoice.

The study showed that the risk profile of a transaction is dependent on the context. It has shown that payment mechanisms entail differences in costs and user experience for buyers and sellers alike, which are a factor in the choice of a particular method. So, the choice is not based exclusively on the perceived risk, but also includes aspects related to the costs and usability of the payment method. This helps explain why there are still so many different payment methods on the market, instead of one universal payment method. After all, there are many different contexts, each requiring its own solution.

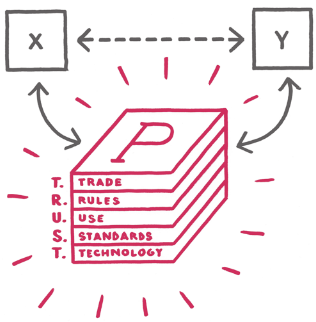
I.4 Summary

The Transaction Context Model includes the most important factors for a transaction, showing where the risk areas lie for both actors. Based on that information, the middleman can write its use cases that define his proposition. When this is clear, the necessary measures to remove potential obstacles can be taken.

> **Risk is divided between each actor, looking for balance.**
>
> **Trust has to be sufficient with both actors, so it adds up.**

II The T.R.U.S.T. Framework

The T.R.U.S.T. Framework addresses the five main interrelated dimensions of a platform.



A recognizable brand, attractive propositions, and an appealing user experience for every type of user; these are important conditions for a successful platform. A middleman will have to put this in place with its platform for its specific market situation and customer groups. To get the propositions and user experience right, it is important, for example, for the middleman to describe the use cases that it wants to facilitate with its platform. Who can do what with the platform? But that is not all.

Platforms also have to take care of less visible matters, like a sustainable business model, solid security, and sufficient availability. Defining clear terms—for instance, on user privacy and the use of data—is also essential. For all stakeholders, starting with the two user groups, these things have to be organized. This is necessary to provide comfort for the intended users so that they are actually willing to do interactions and transactions via the platform. So, all the designers, developers, and operators of platforms have to address a number of subjects, at all kinds of levels, which are all interrelated. For instance, a decision on technology, such as using a certain security standard, can have important consequences for the legal conditions; or it can create a threshold that can have a negative effect on the user experience, and as such affect the business case.

II.1 The Five T.R.U.S.T. Dimensions

How does the middleman structure its platform in such a way that it is functional and offers the intended added value? How does it ensure that it is accessible to a large number of users on both sides of its market? How can it be sure that there isn't something crucial it is missing? The T.R.U.S.T. Framework can help.

T.R.U.S.T. stands for *Trade, Rules, Use, Standards,* and *Technology*. In this multi-dimensional approach, all the relevant aspects that a middleman has to deal with on its platform are discussed. These five dimensions have to be looked at in their entirety at all times; not only when developing the platform, but also during its operation, to ensure its coherence. All these aspects are aimed at creating trust among the users in such a way that they are optimally willing to use the platform. And, although the order of the letters in the acronym T.R.U.S.T. may suggest the topics are treated consecutively, this is not the case. In reality, all topics intermingle over time, all the time.

The value proposition can be seen as the backbone of the platform: what does the middleman with the platform want to be for its customers? This is based on the need that the platform meets for the user groups, and it is translated into market propositions. As we described in Chapter 2, this has to do with the bundles of functionalities that are being provided to the different user groups to enable the intended interactions and transactions via the platform. The value propositions determine the way the five dimensions and the framework are organized. Factors that can play a role in that process are, among other things: which two (or more) user groups will the platform service? What problem will the platform solve for the users? Which steps in the value chain will the platform facilitate? Is the proposition symmetrical or asymmetrical? How does the onboarding of users take place? Is there an onboarding process that involves an elaborate registration procedure? Where does the platform set itself apart from competitors or alternative solutions? Will transversal platforms be used for certain process steps? Is the platform part of an ecosystem? These are just some of the questions the middleman will have to answer.

There is no standard recipe; like a chef, every middleman will have to flavor its T.R.U.S.T. Framework in such a way that the added value for all the stakeholders tastes the best. When the middleman has mulled over all the relevant aspects in their mutual coherence, it can start building its platform. While it is building its platform, its insight will improve, and even after the platform has gone live, that process will continue. After all, technology develops continuously, which means new opportunities will present themselves. As a result, competition is also in constant flux, and things will evolve accordingly. That means that platforms are never "finished" but have to adapt all the time. Let's have a closer look at the five dimensions summarized in Table 11.

Table 11: T.R.U.S.T. dimensions

Dimension	Aspects
Trade & business	Business model, branding, licensing, and access criteria
Rules & regulations	Rules and regulations, rights and obligations, user terms, availability, governance, and compliance
Use & application	Functionality, use cases, and customer journey
Standards & semantics	Industry (or de facto) standards, semantics, and behavior
Technology & infrastructure	Medium, technology stack, connectivity, scalability, and security

1. Trade

The first dimension of the T.R.U.S.T. Framework is *Trade*. It includes the strategic decisions that have to be made about the platform's gist, starting with the brand under which the platform will be known and recognized. That is important because that is how users will recognize the platform, especially if it is used transversally by other platforms. Secondly, business continuity requires the outlook on making a profit. While initially, the main focus may be on generating reach on both sides of the platform, at some point that reach will have to be monetized. How is value created and where will the money be earned? Sometimes, this will not yet be clear at the start. For instance, the founders of Google initially stated they would never give advertisers access to their platform because that would stand in the way of the objectivity of the search results. By now, advertising is their most important revenue source, to the tune of over 94 billion US Dollar in 2017. [4] In other markets, there are agreements about which side of the market pays; for instance, in the case of telephony. When the recipient of a phone call has a different provider, the charges will have to be settled at some point. In the case of telephony, the caller usually pays.

> “ ***Trade* includes all strategic decisions: how does the middleman create added value for all stakeholders and user groups?**

Middlemen will have to devise their business model then, including all dimensions that create value for the company and the way that value can subsequently be translated into money. Often, the resulting revenue model will have a complex structure because multiple user groups are involved, and the middleman can operate in a hub model or in a network model, which is a very important choice. All the stakeholders have to be involved in the model, including the primary user groups and other partners who add value to the platform. The core of every revenue model is that it must include a transaction structure that is profitable for the platform itself, as well as offer the best choice for all the stakeholders involved. A well-functioning business model is like a mix panel providing a perfectly balanced piece of music: one change can upset the overall balance.

Another aspect is the organization of the platform. With which people and parties will the middleman develop and run the platform? Who plays which role in realizing the added value? How is the organization structured, and what is the decision-making process like? Which activities are carried out in-house, and which are outsourced? Strategic dimensions involving branding and communication are also included in this dimension. When the middleman operates within the network model, it is possible that agreements will have to be made with the other participants in the network, for instance, on the access criteria to participate and licensing to operate in the network.

2. Rules

The second dimension is made up of the *Rules*. While the first dimension involves the decision as to which roles the two user groups and all the other stakeholders play in realizing the added value of the platform, in the second dimension, all this is translated into agreements that adhere to the applicable rules and regulations, and that are, legally speaking, airtight. The main focus is on structuring and securing the influence and decision-making process of all stakeholders involved. What are the boundary conditions within which the stakeholders operate, which roles and responsibilities does that imply, and how is change handled?

> “ ***Rules* represent the translation of the strategic decisions into agreements that, legally speaking, are airtight.**

All the relevant disciplines are involved: marketing, IT, support, finances, legal affairs, and human resources. Requirements regarding the platform’s availability are also relevant: is the service’s uptime 24/7, or can the platform be down at certain times? The service levels have to be clear. These ambitions have to be well-defined and doable in practice. Agreements also have to be made with parties outside the platform; for instance, user conditions and agreements about liability, but also contracts with suppliers. If the middleman operates in a network, entry conditions for new participants can be added to that.

Within this category, good *governance* and correct decision-making are secured. *Governance* can be seen as a set of rules describing who can participate in a platform, how its value will be divided, how conflicts will be resolved, and how the relevant decisions are made. These issues require additional attention in the case of platforms because their value is generated largely by users and stakeholders outside the organization, with the middleman helping to direct the market. Users are often actively involved in a platform for which they provide a share of the added value. The platform to a large extent is dependent on their satisfaction, especially when there are comparable alternatives[5]. As we mentioned earlier, that makes privacy an important subject, and, among other things, because it is relatively simple for users themselves to control. It can be wise to give them some sort of say, as Facebook finally did in 2012 when changing its privacy policy.

3. Use

The third dimension of the T.R.U.S.T. Framework is *Use*. Here, the translation is made from the propositions toward the required functionalities for the two user groups, describing how a consistent user experience is provided to the users, which use cases will be supported as a minimum, and how that will be organized in functional terms. In other words, within this dimension, the functional design is developed on the basis of the user requirements resulting from the intended customer journey to be facilitated, in different situations.

> ***Use* represents the translation of the propositions toward the required functionality for the two user groups.**

In the case of an asymmetrical proposition, the needs of the two user groups cannot be addressed with one proposition, because the role of each user group requires its own functionality. On a platform like

Airbnb, for instance, the guests and hosts both have their functional requirements. The complete customer journey—in this case, the process of providing or looking for accommodation and then comparing, choosing, paying, changing, and evaluating—is mapped. This process is described in detail from the point of view of both sides of the market. This includes the process of becoming a customer and determining the identity of the two types of users, the first phase of what we defined earlier as onboarding.

Based on the Transaction Context Model we discussed, the middleman can describe all its use cases in terms of risk. This sheds light on which perceived risks both customer groups may experience in different situations, and which the middleman will have to mitigate by designing sufficient trust mechanisms into its platform.

4. Standards

The fourth dimension of the T.R.U.S.T. Framework is that of *Standards*. In its broadest sense, this is about what is the norm in a certain sector, from a technical perspective. What are the paradigms on which existing approaches and solutions are based? Are there formal industry standards, like specifications or protocols, that have to be used? Examples can include standards that are prescribed by an organization like ISO, but also by UN/CEFACT, the department of the UN involved in promoting trade, among other things via electronic trade standards. Or Etsi, a European organization involved in the same matter, and GSMA, an organization focusing specifically on mobile telecom.

> “ ***Standards*** **are the applicable norms in a market. This can refer to technical standards or widely accepted behavior.**

If there are also de facto standards, which are not prescribed but are widely used, they can become standards; for example, the iDEAL payment platform in the Netherlands. Other examples are iOS and Android, the two standards of Apple and Google, respectively, for operating systems of smartphones and tablets. In fact, LinkedIn and WhatsApp have also become de facto standards in their own domains. It may be profitable for a middleman to adopt these standards. They will provide access to other value chains with large groups of users, enabling the platform to create the conditions for triggering network effects.

In addition, it is important to gain insight into the way data are interpreted. Which semantics are being used? For instance, the UN/CEFACT CII standard for e-invoicing[6], in which both the technical format and the data models have been standardized. Finally, it is important to list the common practices, mapping how people work within, or outside, a certain sector. Are there certain types of behaviors among the user groups that could be described as "the standard"? And are there "standard" infrastructures that they use, which the middleman can build on? In the logistical sector, the sea container is such a standard, as is the format of invoices for invoicing. Perhaps there are also user groups that the middleman can connect to with its platform, like the customers of a certain type of credit card. An important advantage of this kind of piggybacking is that it saves on costs. However, an ambitious middleman can also decide to introduce something that is entirely new, force a paradigm shift, and ultimately set the new standard.

5. Technology

The fifth and final dimension of the T.R.U.S.T. Framework is *Technology*. What is the technical design of the platform, and what is its architecture? It is important to map the entire "technology stack"; the set with all the software components that are needed to offer the desired services. This provides the foundation on which the rest of the platform is built, and it is the basis for an optimal user experience. Decisions that are made at this level are difficult to reverse later on, which means that the middleman has to know exactly what it wants to do with its platform so that it can choose the right software. For instance, if it wants to be available 24/7 with its services, that is an important consideration at this stage. The same goes for the number of users it ultimately intends to attract to its platform and how often they will then use the service. Does a certain software solution provide the options the middleman needs to support the envisaged platform traffic? Next, a decision has to be made about the level of openness of the technology involved. The connections of the various software components are also mapped here, both within the platform and to the outside world; for instance, with regard to APIs, which can provide access to other platforms. In most cases, a certain level of connectivity is needed to facilitate transversal functionality, for example, if the platform uses a specialized digital payment platform. An important part of this dimension is security: how is the information secured against all kinds of misuse? How is user privacy ensured? All these matters are aimed at the reliability of the platform for its end users. The Internet as a basis and cloud services like AWS, Azure, and Google Cloud provide good options.

> ***Technology* refers to the architecture of a platform. It also includes the "technology stack," the set of software components needed to be able to offer the desired service.**

Although these days, nearly all digital platforms use the Internet as a medium, it is possible to choose a different, less-open network technology deliberately. There are various situations where that may be a relevant option; for instance, when the platform is part of a network model, in the case of telephony. Or SWIFT, which provides its own network for transaction banking. Also, the platform may be part of an ecosystem in which complementary functionalities are provided to customers. Twitter and PayPal, for instance, allow their users to link other apps to their accounts, using a variety of APIs and toolboxes.

II.2 Trust in the hub or network model

A fundamental decision in designing a platform is whether to go for the hub or the network model. To a large extent, the choice is determined by what the competitive landscape looks like in the market in question. On the other hand, we saw earlier that a choice for a certain model has a major impact on the kind of competition the platform will face. In this section, we show that this choice, above all, determines the way the middleman has to organize the trust dimensions. That is why we distinguish two versions of the T.R.U.S.T. Framework, which are, in essence, the same, but which align with the two strategic models.

In these two versions, the difference between the *collaborative domain* and the *competitive domain* plays an important role. Whether the platform is organized according to the hub model or the network model, the middleman will always have to organize its trust dimensions within the competitive domain as shown in Figure 36. How will the platform be positioned within the competitive arena? If the middleman chooses the network model, then in addition to the competitive domain, there is also a collaborative domain, in which all the participants in the network are united. Agreements now also have to be made along the same trust dimensions that apply to all the participants, or else they cannot trust each other as part of the network. This is the main difference between the blueprints of the hub model and of the network model. We take a look at both.

T.R.U.S.T. in the hub model

When a middleman chooses the hub strategy, that essentially means it stays in control of everything. It does not depend on other providers in a network for the delivery and execution of its value proposition but is in a position to service both sides of the market independently and directly with its specific services.

A middleman using a hub strategy only has to deal with the competitive domain.

In that case, the T.R.U.S.T. Framework falls completely inside the competitive domain, where the middleman will try to organize all the aspects of its platform in an optimal and distinctive way for its target groups. Even if it could, in theory, work together in areas that are less competitive in nature, it decides to stay in control as much as possible. This means that the middleman can start organizing the T.R.U.S.T. Framework as described in the previous paragraph. Because it only operates in the competitive domain, it does not have to occupy itself with the collaborative domain.

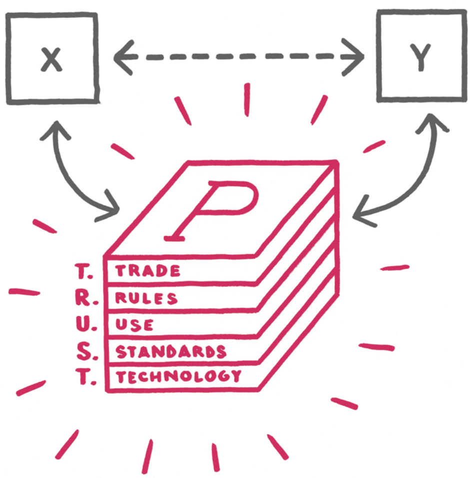


Figure 36. The five dimensions of the T.R.U.S.T. Framework.

T.R.U.S.T. in the network model

On the other hand, the middleman can decide to work together with other, similar parties. Those providers aim to present the value proposition together to as large an audience as possible, working together on the non-competitive aspects of their platforms. The decision to go for the network model is not an easy one because it often involves a large number of stakeholders, making things even more complex. An important reason to go for the network approach anyway is a desire to "make the pie bigger." By servicing the entire market together, it is possible to maximize the adoption of a proposition. However, it takes a long time to reap the rewards of such collaboration, and it is uncertain for the individual participants whether or not they will enjoy those benefits to a sufficient extent. Often, it starts with a small number of existing market players endorsing the importance of working together. When an initiative is seen as being successful, more and more parties will join. In other cases, it is the government that, from a social perspective, favors collaboration, for instance, because of the potential gains in efficiency. If the collaboration is successful, it can really take off. This was the only way that, for instance, MasterCard and Visa, the Internet, and mobile telecom were able to become the success stories that we know today.

> A middleman who adopts a network strategy has to deal with the competitive domain as well as the collaborative domain, which means that it has to organize the T.R.U.S.T. dimensions together with the other participants in the network.

What does this mean for the composition of the platform? The main difference is that the middleman, in addition to having to organize the competitive domain, also has to organize the areas in which it works together with its fellow participants, the collaborative domain. It will have to do so with the participants involved in the network, creating a joint framework from where, based on the collaboration, the five trust dimensions are organized and managed. This collaborative domain can be seen as a set of agreements—also known as a *scheme* or *trust framework*—to which every participant subscribes, and on the basis of which participants can build technical connections and legal relationships with each other. Figure 37 shows how the T.R.U.S.T. Framework can be applied to the network model.

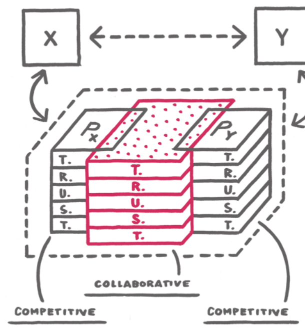


Figure 37. T.R.U.S.T. in the collaborative domain of the network model.

In the center, we see the T.R.U.S.T. dimensions as part of the collaborative domain for which joint agreements have to be made. Next to this, we find the T.R.U.S.T. dimensions within the competitive domain, which every middleman has to address for its own platform. This model shows, for each dimension, where individual participants work together and where they can distinguish themselves in the market and compete with other participants in the network. Ultimately, the goal is for the participating platforms to be able to deliver the intended joint services at the desired level: in principle, all their shared customers get the same user experience, leaving enough room for the platforms to distinguish themselves and to compete on the basis of the propositions for both user groups. The scheme or trust framework provides the context within which the middlemen can operate their own platforms. It does not stop there. The management of the agreements also has to be organized for the exploitation phase. Typically, a new organization is set up to take care of the shared functions—often not-for-profit and non-competing—of the T.R.U.S.T. Framework, on behalf of all the participants.

II.3 Summary

The T.R.U.S.T. Framework defines all the interrelated aspects that are relevant for designing, building, and running a platform. They are grouped along five dimensions: Trade, Rules, Use, Standards, and Technology, which have to be assessed coherently at all times. The aim of all these aspects is to embed trust into the platform for the users, so as to minimize their hesitation and maximize their willingness to use the platform for their mutual interactions and transactions.

> **Shortest:**
>
> **One transaction, two actors, three processes, four context factors, and five T.R.U.S.T. dimensions.**

SIDESTEP

Practical tips for realizing a collaborative T.R.U.S.T. Framework

Getting the participants of a network on the same page is a delicate process. How can you get to a broadly supported set of agreements, which is the basis of every successful network platform? Here are seven practical tips from the INNOPAY practice.

1. Start with the end in mind

Or, start with the aspirational objective, the goal of the collaboration. It always starts with the customer: what problem is being solved, what is the basic proposition, and what does the customer journey look like? When the end user is not the winner, everybody ends up losing. Start from that central vision and keep communicating it throughout the process.

2. Secure a leading group of innovators

And keep expanding it continuously. This will create lasting support, as well as an ongoing flow of ideas and improvements.

3. Organize co-creation

And do so in small, manageable, and multifunctional groups. Communicate effectively with the outside world, laying the foundation for adoption by other participants.

4. Optimize holistically

Bring the five T.R.U.S.T. dimensions together and develop them jointly, quickly and coherently.

5. Pinpoint the added value of collaboration

Make the added value of the collaboration explicit and indicate where there is competition, always with an eye on the end user. Recognize individual roles and interests.

6. Use the "Agile" approach

Use timeboxing and iterate frequently, making sure that delivering results and budget management go hand in hand.

7. Be transparent

Be clear about the progress, participants, and milestones that have to be reached. Communicate the entire time!

Chapter Four

TRANSACTION PLATFORMS


IN DATA
WE T.R.U.S.T.

4.1 Introduction

> **"No interaction without data, and no data without interaction."**

Everything is data, and data is everything. Data is the digital oil—especially big data. Everyone talks about it, but only a few have access to it. The subjects we have discussed so far have given us a clearer view on the concepts of interactions, transactions, and platforms. Data play an important role: transactions thrive on trust and, in the digital world, trust comes in the form of data. Information provides the building blocks with which middlemen with their platforms can provide users with attractive propositions *and* trust. Very successfully and with far-reaching societal consequences, like new forms of cab transportation, vacations, and temporary work. But what data are we talking about exactly? As expected, within the framework of this book, we are talking about "transaction data," which are, by definition, personal or business data because transactions are always made by actors—or under their responsibility. So we are not talking big data as in radio waves from outer space, oceanic measurements, or traffic statistics.

Transaction data are generated at every *touch point* within a *customer journey*, in the platforms that facilitate those touch points. It is important to keep in mind that the middlemen with their platforms are actually operating on two levels. At the top level, they facilitate interactions or transactions between users exchanging value, without the middlemen being involved as actors. But on the underlying level of data exchange, middlemen are very much actors. They are the counterparts to each user on either side, making them rightful co-owners of the data from their interactions with each user.

> **Data are a new bartering agent that can be monetized infinitely. In that sense, data are fundamentally different from money, while other differences are marginal.**

Middlemen have discovered that they have the opportunity to monetize these transaction data on other markets as well. Together with the onboarding data, these transaction data have major value, because they constitute rich user profiles; profiles that consist of information about the user, about their behavior, and, increasingly, also about their reputation. The data concerning the latter are created when third parties interpret the behavior data of people or businesses and start building their opinion about such users. Reputation data then become self-reinforcing because, in the digital world where everything is recorded constantly, these data again become part of the profile. This enhances the ability of middlemen to provide trust and to reinforce their institutional trust role. This is great because it helps more and more users become active in the digital domain.

At the same time, this leads to an increasingly and more strongly felt imbalance between user and middleman with regard to benefiting from the data, with users being at a disadvantage. Users have insufficient control of their rich profiles and have little grip on how these are used, and on what they get in return, other than the mostly good and free services that offer a lot of convenience. So, the *data benefit balance* is skewed. It is possible to restore that balance through legislation (like the GDPR and the directives and acts under the Data Strategy) and the development of a new infrastructure, which can generate trust by giving consumers control of their own profiles. This provides opportunities. *Digital self-determination*, *data sovereignty*, or *data sharing* as new propositions and functionality for individuals, including in their role within businesses and governments. This is a new two-sided market, for which both hub and network-model platforms are possible, and which is already giving rise to a new category of innovative businesses.

4.2 Data as Versatile Value

Data are knowledge, and knowledge is power. In other words: the one who controls the data is the winner. Nothing new here, you might say. That was already the case back when trade was mostly organized along linear chains in the physical world. And yet, in this age of *platformation*, it is even more true. The aforementioned, large digital platforms of today have, in part, reached their dominant position thanks to the enormous amount of data they have at their disposal, and which, it turns out, are a goldmine. How can that be explained?

Let's start by zooming in on the concept of data. Data are extensive, so it helps to draw distinctions. Important distinctions in data are those between structured versus unstructured and internal versus external data. Many data are used to analyze and optimize processes; for instance, in production, for maintenance and quality, or in administration, to track targets (KPIs) or to detect fraud. Thanks to ongoing digitization, data automatically become "big," an adjective often used in combination with "data." But these are not the data we want to talk about. In this book, we talk a lot about data, and when we do, we explicitly refer to the transaction data of two parties interacting, which are recorded in a structured form by platform players.

> Although the middleman with its platform is not an actor in the value exchange itself, it is one in all the digital interactions that facilitate the transaction process between the actors.

This type of data tells a lot about the parties involved and can be used to make commercially interesting predictions, as witnessed by the huge success of platform players with access to data from both sides of the interactions and transactions.

To understand what is going on here, we first need to go back to our definition of an interaction. As we saw earlier, exchanges between two actors—X and Y—by definition, take place via "something in between," which, in the digital world, is the middleman with its platform. We see the middleman facilitating a value exchange, often without taking a position itself. However, to do its part, it is involved in multiple digital interactions with each of the two actors individually, with X and with Y. This is the result of the two-sidedness and the fact that both actors, independent of each other, interact with the middleman, from their side of the market. The speed with which the interactions occur gives the actors the impression that they are interacting with each other directly. The value chain is short and quick, and in addition, it changes direction all the time during the interaction. The middleman, however, does play a role as counterpart at the underlying level. In other words: at a data level, there is certainly a regular linear chain, with the middleman acting as—as the word implies—*middle*man.

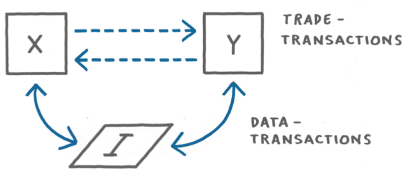


Figure 38. The data triangle and the position of the middleman at the two levels of data exchange.

We can call this the *data triangle*, one which ultimately ensures that everything works. In the data triangle, input data are converted into output data. These are the transaction data that we keep mentioning, as an important part of personal information or identity.

As we discussed earlier, *input data* are the data that enable the transaction to take place. Think of the user data with which the identity of the actors involved can be established, and which enable checking throughout the process whether the same actors are still involved. This assurance of the authenticity of the actors is a condition for a transaction, and it provides the basis for the agreement. It prevents one of the parties involved from later claiming that "It wasn't me..." It also has to be clear what exactly the exchange entails: what do the actors bring to the table? It is only when all these input data have been provided that the transaction, facilitated by the middleman, can take place. However, input data can be much more than just user information. We are talking about the contextually relevant data within the actor profiles, which provide more background and color to the actors involved. This makes it possible to optimize the interaction.

Then there are the data that result from the transaction itself, the transaction data. In essence, this is a transcript—or a log—of what took place. It includes all possible user and use data: who was involved in the exchange, what has been exchanged, and what was the outcome? It involves the data resulting from all the interactions that were needed for the exchange, and that took place via the facilitating middleman. We already called this the *output data*, and which are, by definition, contextual data because they contain the entire context of the interaction. This includes the profiles of the actors, the goal, the tools being used, the location, the time, the payment/delivery, and the outcome.

User Profile

When we talk about personal data, we use the term *user profile*, or simply *profile*, while, in our industry, often the terms *identity* or *identity management* are used. Identity is about recognizing the entity, making it, in our view, a—relatively static—part of the profile. Profiles contain data that have a lot more contextual value.

Figure 39. Types of data within user profiles.

The profile of an actor contains the following three types of data:

- *Entity data:* user data about the acting entity. Typically, these are attributes like name, gender, age, alias, and account number. They can also be attributes belonging to certain *address spaces* of open infrastructures, like address (street, number, zip code, town, country), e-mail address, telephone number or, in relation to platforms, *Skype ID* or *Twitter handle*. These data tell us something about who the actor is, how you can reach them, and how you can address them. These are, literally, *id-entities.*
- *Behavior data:* user data that the acting entity generates itself with its digital activities. All the transaction data from interactions or transactions with others, consisting of all the input data (data being used as input, the profile) and all the output data (data being generated). In essence, these transaction data provide a record of personal behavior and, as such, provide insight into what the actor does based on its activities, interests, preferences, etc.
- *Reputation data:* are new data about the acting entity, created by third parties by interpreting the entity's behavior data. This means that these data tell us something about what others think about the actor based on its actions—an important indication of trust.

This kind of profile is nothing new. Individuals and businesses have had them for ages. When you behaved in a trustworthy manner, you would be labeled "trustworthy." Entity data were recorded early on, while behavior and reputation data existed mostly in people's minds. What is new is that now all the output data is stored digitally, usually by one of the two actors (middlemen or organizations, and their platforms). This leads to the amount of behavior data exploding in size. By collecting and analyzing these data systematically and sometimes even automatically, the amount of reputation data also grows exponentially. Typically, without the knowledge of and beyond the control of the actors involved, even though these data will become part of their profiles. This results in an even louder call for transparency, and increasing concerns about privacy.

What is also new, is that such detailed profiles then are available digitally as input data, which has a huge value in transactions. However, due to the one-sided logging of data, this is usually not done by the actors themselves, but by the middleman owning the platform because the latter ultimately has far richer profiles of the actors than the actors themselves.

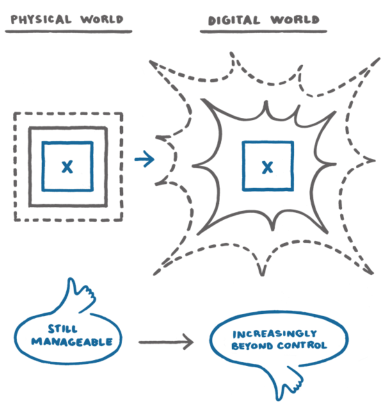


Figure 40. User profiles in the physical and digital world.

By now, it is also clear that those profiles represent a lot of value, with the middleman as the completely legitimate owner of the data. In the last ten years, middlemen have discovered how to make money with these data while offering free services at the same time; and then some, considering the fact that seven of the ten most valuable companies, in terms of stock exchange value are data-driven companies. In mid-2018, they were Apple, Amazon, Alphabet (Google), Microsoft, Facebook, Tencent, and Alibaba, respectively[1].

Their value is created on two levels. First of all, a middleman builds authenticated reach on both sides of its market, using a one-time onboarding procedure for both actors and acquiring entity data. This provides the basis for transactional trust. Then over time, a behavioral profile is compiled of all the actors, from their recurring use of the platform. By interpreting all these data, a reputation for the actors can be created, and risks can be managed. In addition, the middleman can use the data to develop ever better propositions for its end users.

DEEPDIVE

Why “big” isn’t always “beautiful”

Platforms often generate huge amounts of data about their users. It seems an attractive goldmine, but that remains to be seen. During the one-time onboarding procedure, the actor provides the platform with information about its identity and, as it keeps using the platform, it automatically generates usage data, often without realizing. The frequent use of a platform by very large numbers of users creates big data. This is the case for all data generated by the use of Internet-based services, such as social media, cloud computing, and apps.

The following few remarks to put big data into perspective. First of all, it is not a subject that needs to be high on the agenda of a beginning platform. A condition for the creation of big data is mass use. This can only be realized through the highly recurring use of a service, by a large number of users; only then is it possible to recognize patterns. That volume can only be realized by a service that is continuously relevant. Since there is only room for a limited number of platforms that play an important and lasting role in our lives, the discussion on big data involves mainly the happy few. For Apple, it can be relevant so as to sell motion data deduced from the use of mobile devices to parties who are active in healthcare, allowing them to distill relevant trends. For a platform that is starting up, or for a platform that does not have the size of Facebook or Alibaba, that is a long way off.

Apart from that, there are other obstacles that companies encounter in the monetization of data. Earlier, we mentioned the fact that European regulation, like the GDPR, provides users with more tools to control transaction data. Already, users have to give explicit consent to their data being analyzed. In addition, companies are held liable when they fail to handle privacy information with care. Another hurdle is that big data only start representing a certain value when they are processed and analyzed in the right way. And that is not as easy as one might think. The enormous quantity of data can often no longer be maintained with “conventional” database models. They require a new type of data mining, providing quite some technical challenges. Often, the data come from all kinds of different databases and systems, which means they are not homogeneous. And the more heterogeneous the data are, the higher the costs of making them usable. For substantiating regular business decisions, this just means a lot of extra work where the costs often outweigh the benefits. The result is that many companies keep making their management decisions exactly as they have been doing for the last thirty years[2]. For the most common business issues, big data are not the answer. Pretending otherwise means spending an inordinate amount of energy and money on data integration. This results in a huge number of projects with expensive technicians and analysts, only 6% of which are successful. In short, not all big data are beautiful.

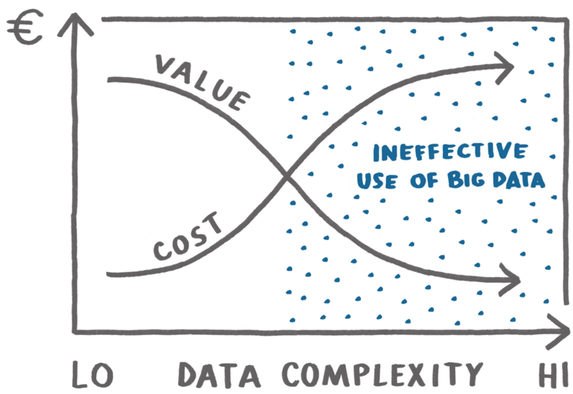


Figure 41. Ineffective use of big data.

Data Are Products, and Products Are Data

As we have seen, all digital exchanges generate transaction data. Platforms use them to fine-tune their services to the needs of their users and to distill trends on a large scale. When a user logs onto Facebook, the platform knows who it is, and that data point alone has value. By giving the platform permission to use cookies, it gains insight into the user's surfing behavior, again, something that represents a certain value. Consumers often provide their personal information under the assumption that they get a "free" service in return. The more information they provide, the more they get in return. For instance, providing an e-mail address may give access to exclusive content. And although those types of exchanges are often experienced as interactions, they are actually transactions in which economic value is being exchanged. This new type of bartering exists in different varieties, with rights, tools, or discounts being offered in exchange for personal data.

We must keep in mind that these services are anything but free because the actor in question (i.e., the consumer) pays with its profile. It accepts, often without realizing it, an agreement indicating that all the profile data associated with its use of the services will become the property of the middleman. In these types of transactions, the actor's profile data play the role of money, turning them into a new digital, universal *barter agent* for digital services. In essence, the actor's personal information is traded for data products, and a "data transaction" takes place. How does the middleman then capitalize on its user reach and user data? Often, that is done by using the generated profiles or parts thereof as a "product" for third parties (i.e., businesses). Thanks to the data, those businesses can reach their target groups more accurately via the platform, for which they pay with...regular money. Think, for example, of advertising services that, thanks to the personal data set, can be aimed with great precision at the recipient. What is also interesting is that the same set of data can be used not once, but an infinite number of times, and sold to every business interested in using them. A great feat of *business modeling*, as the impressive profit margins of successful platforms prove.

Data are a new type of money that can be cashed out endlessly.

Data Is Money, and Money Is Data

It is often said that "data is money." Successful platforms like Facebook and Google are built on the principle that data are valuable. They see data as a new type of money. But, unlike money, data can be copied and reused an infinite number of times. Those who are in possession of the data—in this case, the middlemen—can reuse and "cash out" this "money" endlessly. This yields much more than the "free" services that they provide (like online searching, e-mail, video, social media). From that point of view, Facebook is more than an advertising service providing access to all kinds of target groups. The platform has sources of income on both sides of the market. The millions of users pay with their user data, while the advertisers on the other side pay with conventional money for their access to those users. Data that consumers provide once is cashed out on the advertising market numerous times. The question can be posed whether consumers place an accurate value on the data they give away. Do they get enough in return? Do they share enough in the proceeds? Under the current system, the value being exchanged in data transactions seems to be askew. There is a growing perception that users are at a disadvantage. The balance has tipped too much in favor of the major platforms that control entire sectors this way. The social impact of this is being felt stronger and stronger. See, for example, the protests surrounding Airbnb, Uber, and food delivery services. Hungarian philanthropist George Soros also mentioned this lack of balance in his speech during the World Economic Forum in Davos, Switzerland, in January 2018[3].

> **The consumer needs to become aware of the value of its data, and of its rights to it.**

Data as a currency has its own set of valuation problems, which, in addition, is in its early stages. If traditional money is used, there is a direct link between the price and the incremental cost price of a product. It is different when data are used. In this case, the thing being bought is usually a service, with a much more diffuse cost price. We saw in Chapter 3 that the value of platform services is not so much determined by their cost price, but by the reach within the two user groups that the middleman is able to realize. For such "demand-side economies of scale," each additional user that actively takes part on the platform, adds to its value. In this case, the sum of all the users determines the value of the product, which means that it is not a fixed value, but a variable one.

In addition, it is difficult for users to know exactly what happens to their data. How often does the platform monetize them? What does it get in return? Apart from increased transparency, there is a need for new calculation models that can shed more light on the value of data. This then must be translated into tools that users can use to deploy their data more economically. Consumers are often not aware that they conduct micro-transactions every day with their personal information. The access to all kinds of tools, content, or services that this gives them, mainly provides them with convenience.

Thus far, a real alternative for consumers has not been found. Many companies in the world of "Personal Data Stores" have tried and many still are trying, including Datacoup, Citizen.me, People.io, Meeco, and MyDex. Incidentally, these are all platforms that address this need in their own way. They all have the ambition of setting the market standard, so they all have adopted the hub model. Ultimately, however, users in this market would benefit from a market standard (network model) that would enable them to cash out their data to all kinds of parties based on a standardized format. At this point in time, it is uncertain how this market will develop in the long run. Maybe Web3 will turn out to play a major role in this regard: a global infrastructure in which individuals and businesses control their data assets, including reward and incentive mechanisms via tokens.

DEEPDIVE

Identity as the new money

Paying with banknotes and coins has become less common for the younger generation, and in the near future, all payments will be cashless, according to British author David Birch[4]. This opinion leader on the topic of digital identity explains that the concepts of identity and money are both subject to considerable change. Let's start with money. What is money, really?

Money is a bartering agent, a manifestation of stored value, a unit of account, a currency. More formally, it is a system for keeping score. In essence, it has little to do with notes and coins. At some point, everybody agreed to use money so to determine the value being exchanged in a transaction. And money was very good at that: for centuries, money has generated large-scale trust between buyers and sellers meeting each other physically and making a transaction.

However, the exchange of value over the Internet requires different ways to organize trust among actors. Suddenly, it is important to know who you are dealing with. This is something that is not automatically embedded in the Internet, where actors can be completely anonymous or simply assume another identity. Cash money does not remove that uncertainty. There is a need for something new, which enables actors to be sure of the identity of the one they are doing business with. That brings us to the second concept that is subject to considerable change: identity. According to Birch, identity has little to do with your name or where you live, but much more with being able to demonstrate reliably that you meet certain characteristics. For example, that you are a student at a certain university in order to be given access to specific information, or that you are old enough in order to be able to drive a car. In many cases, these characteristics will have nothing to do with your name. In fact, the fact that your name is printed on a credit card does not make it any more secure. On the contrary, no cashier is interested in it, but criminals all the more. With your name on the card, it is much easier for them to take off with your money. According to Birch, identity has everything to do with reputation, something that we are gradually—and with increasing reliability—building up within the digital domain. This reputation, this social capital, is provided by all the data that is stored in mobile phones and social networks, and makes it possible to determine an actor's identity and enable transactions to take place in a reliable way. At the moment, it is easier to get to know something about a person via a platform like LinkedIn than via any other monitoring system. As soon as this social capital can be monetized into transactions, cash money as we know it will become redundant, according to Birch. Identity will take over the role of cash money. In the near future, identity will replace cash money in transactions. Data will serve as "change," and have an explicit value. In the long term, new forms of digital money will emerge so as also to conduct bigger transactions.

At the same time, money has also become less and less tangible. While, in the past, we would pay each other with shells, beads, gold, coins, and paper, these days, we increasingly do so in a digital form, with bits—electrons instead of atoms. Cryptocurrencies are a good example, as is electronic money. Simply put, an amount in a bank account and transferring money to each other via mobile banking. Money is increasingly becoming data.

BACKGROUND

Money as "solidified trust"

In the Pacific Ocean, there is a small island called Yap. The island became famous because it helped economists answer the basic question: what is money actually? Perhaps it is a total coincidence that Yap written backward spells Pay. Apart from that, the island has an interesting history. A few hundred years ago, the Yap islanders found limestone on an island a few hundred miles away. They cut the limestone into enormous slabs and brought them back to their own island in their small bamboo boats. Why they did so, we don't know, but we do know that they then started using those slabs as currency. They had no gold or silver, but they did have these enormous limestone slabs. The people saw them as valuable and used them to make large purchases. It is interesting that the slabs were not physically handed over from buyer to seller. They remained where they stood because everybody knew who the owner was, and who had paid whom. In fact, there was no need for the slabs to even be on the island, the islanders at some point started to realize. One time, folklore tells us, a newly cut slab ended up at the bottom of the ocean in a storm. And although the slab has been on the bottom of the ocean ever since, it is still in the possession of one of the islanders, although none of today's islanders has ever seen the limestone slab in question.

You may think that that is strange but, in fact, it is a lot like how we deal with payments today. The only physical thing we hold in our hands is a bank statement with numbers on it, which we have to assume are correct. In other words, data. In both cases—the Yap islanders, with their limestone slabs, and us, with our bank statements—the point is that trust has been made tangible, is "set in stone" or "frozen in data." Whether we pay each other with limestone slabs that stay where they are, hand each other sacks of gold, or wire each other digital money, the condition is—given the circumstances—that there is a generally accepted form of trust. Only then can trade flourish.

4.3 The "Data Benefit Balance"

According to the logic of interactions, the transaction data that can make user profiles so valuable can only be created through the interaction between the two actors involved. This means that, by definition, both actors share equal ownership of all transaction data. Exclusive ownership is simply out of the question. In an ideal world, after an interaction, they would both end up in possession of the complete transaction data. They would then both be able to monetize it on the data market endlessly. When that is the case, there is a *data benefit balance*.

Data Ownership

However, it is sometimes very complex to determine where the ownership of the transaction data lies—as we indicated in the first chapter of this book—because it is often unclear who the actors actually are to begin with. When an actor asks Google a question, Google answers. Both sides take part in the interaction. But who owns the data about the fact that this actor asked that particular question? It seems reasonable that both actors have ownership. And to then use that data, both parties have to give consent. These sorts of questions are now managed in general privacy statements that are drawn up within legal frameworks and in which actors give permission to platforms to use their data for specific purposes.

> Transaction data is, by definition, only created during interactions between two actors. This means that the data cannot be the possession of a single actor.

However, often, more parties appear to be involved in an exchange. For example, company A uses the services of an enterprise to send an e-mail campaign, targeted at its contacts. The processing company only acts as distributor and cannot claim ownership of the e-mail addresses because there is no direct relationship between the processor and recipients of the campaign. However, if company A uses a file with a third party's contacts for its e-mail campaign—for instance, the subscribers of a magazine who have given consent—company A, as the initiating party, also has no ownership of the e-mail addresses but acts as a one-time processor. In the case of a transaction, things are even more complicated. The payment process alone involves at least four parties: on one side, the initiating actor X —the buyer—making a purchase and its bank carrying out the payment, and on the other side actor Y—the seller—and its bank receiving the money. They all play a role in the transaction. Who owns the data of that purchase, and where do the rights and obligations lie? In this example, both banks act as middlemen. Actor X has a direct relationship with the seller and with its own bank, which processes the payment on its behalf. The bank of actor Y is just a processor distributing data without adding anything else. In that specific role, this bank cannot claim ownership.

So, the role of the middleman can vary: if there is a direct relationship with the actor taking the initiative, the middleman involved is automatically responsible for the transaction. When the middleman chooses to work together with another middleman to carry out its task, in this case, the bank of actor Y, that second party is the processor. The responsible middleman has the obligation to be transparent about with whom it shares privacy-related information. It also has to check whether that party acts in accordance with the law. In the case of a data leak at the processor, the middleman, as the outsourcing party, is responsible.

In practice, transaction data rarely end up with both actors but go to the actor that is equipped for them (i.e., organizations and their platforms). Consumers are at a disadvantage because—as we mentioned before—they are insufficiently aware of the value of structured transaction data, are insufficiently equipped, and settle for unstructured data, often in a non-digital form. For instance, receipts, invoices, e-mails, PDFs, etc. Again, consumers need to become more aware. They often fail to realize that this transaction data exists and that they are entitled to it.

And this is where the misery begins. As we've said a couple of times in this chapter: there is a lack of *data benefit balance*. This makes people increasingly worried and undermines the very trust that could be reinforced with the user profile data. More and more consumers feel this situation is unjust, and privacy is increasingly a subject of discussion. Of course, services are provided in exchange for the data they give up, like attractive social media tools, e-mail, or video, but users simply lack the infrastructure to (re)use their data in the same way platforms do.

The data benefit balance has to be restored in favor of consumers. Below, we will take a look at other solutions, such as OK.app, Digi.me, and the network model of Qiy. In Europe, the new privacy regulation, GDPR, serves this objective exactly. It aims to put consumers first in the data game, by making "their" data available to them. This is illustrated by the rules about *explicit consent* that has to be given for the use of personal data, and about *data portability.* Since May 2018, consumers have a legal tool with which to address middlemen about the use of their personal data. But, although Europe now has the strictest privacy laws, the road to change has only just begun. So far, the result of this new law has, above all, been a deluge of e-mails, in which organizations ask them to give their consent, for the first time or again, and to agree to the use of their personal data. Despite of legal rights, consumers still lack a functional tool for controlling and reusing their data.

> **The data benefit balance is askew, to the disadvantage of consumers. This must be restored.**

Users don't have a real choice. In part because privacy conditions can be extremely verbose, and partly because not consenting may mean the end of the "free" services. In addition, for now, the only place where consumers have an overview of who they have given their consent to is their e-mail inbox. The infrastructure and services to assess and manage these consents are lacking, along with the communication and awareness. So, there is still a long way to go.

We will take a closer look at this in Chapter 5.

Data Sovereignty and Digital Self-determination

Restoring the data benefit balance offers opportunities. More and more companies are discovering the phenomenon of data and are wondering what they can do with it. Many are looking for ways to market their data to other players, and for ways to enrich their data with data from other sources among businesses and governments, in what is known as *data sharing*. This is also a two-sided market, incidentally, because more and more data are shared by large groups of actors in a "many-to-many" way. It is important to draw a distinction between the sharing of structured and unstructured data. Sharing unstructured data has evolved considerably through infrastructure such as e-mail, SMS, WhatsApp, and, of course, regular mail. All over the world, these digital infrastructures have developed rapidly since the early 1990s. A characteristic is that every exchange involves a human being able to interpret the unstructured information and take follow-up action. Artificial Intelligence techniques make it increasingly possible to have machines interpret unstructured data. Think of autonomous driving, facial recognition, and fraud detection in this regard.

BACKGROUND

PSD2 unintentionally unlocks privacy- and competition-sensitive information

The new European payment guideline PSD2 came into force in 2018. It gives third parties access to the transaction data of their clients at their banks, under the condition that the client has given their consent, and the third party has the required license. Although this guideline makes many interesting innovations possible, there is also a risk. Imagine a middleman of a longitudinal platform persuading its client to give its consent to improve facilitation of its own transaction step. This means that it is allowed access to the payment transaction data of the client, which also contains information about transactions with others. According to the GDPR, personal counterparty information in the transaction statements must be illegible. But by looking "sideways" at the same transaction step at other parties, the middleman may have access to more than the intended information. Since payment transaction data always applies to two parties, it automatically contains information about the other party as well. This way, the platform gains insight into its client's transactions on competing platforms.

The sharing of structured data is a different and much more complex story. This is because the content must be interpreted by machines, which is much harder to standardize. Within certain sectors and in specific transversal applications (perpendicular to chains—for instance in the case of payments and authentication), it is possible to standardize, making it possible to share data via an infrastructure. That has been proven by now.

Advancing technology has made sharing data by organizations easier over time. Thanks to developments in connecting computers like broadband, APIs, and new protocols (such as SOAP, REST, and JSON). Major platform players also use APIs to keep their services attractive. Twitter, for example, has made it possible to connect third-party apps to the user account. Since 2010, PayPal allows external developers on its platform, and Google Maps can be used to display departure and arrival times of public transport or Uber taxis in real-time.

PSD2 regulation in the financial sector has also been contributing to data sharing. Since 2018, users have a right to access their banking information and initiate bank transfers with apps other than their own banking apps. There has been much ado about this between the banks and the fintech sector. In the end, the attempt to standardize the API meant that apps were allowed access to the bank accounts. The question is whether there will be one single standard in Europe, with the market being as divided as it is. This is unlike in India, where in 2016 authorities imposed one API standard that fintech parties could use to offer new services to bank customers[5].

Other technological terms regarding data are *analytics, machine learning,* and *artificial intelligence*. These terms overlap to some extent and have been around for dozens of years. They focus on presenting data (*description*), obtaining insights (*diagnosis*), and predicting processes and behavior (*prediction*). Since about 2010, there has been increased attention to these subjects because of developments in computing power, bandwidth, and, of course, data as such. The major impact of social platforms on society is also a contributing factor. To be able to turn data into information, data will have to be *available*, *accessible*, and *applicable*. Together, these three qualities make up the so-called *Triple-A Model*. Data availability happens because of ongoing digitization. Accessibility has to do with disclosing and sharing the data under certain conditions and for certain applications, including analytics, machine learning, and artificial intelligence.

When data move within a single organization—for instance, platforms with a hub model, but also non-platform companies—that organization has full control of all the "A"s. When data are shared between actors, agreements will always have to be made about the three As. And, while API-technology may make the data easily accessible, the aspects of availability and applicability deserve extra attention to ensure trust between the actors.

Although technically speaking, a lot is possible in reference to sharing data, the crux of the matter is the existence of trust between the sharing parties, especially in the two lower layers of the Triple-A Model. When parties know each other well and trust each other (for instance, different departments within an organization), there is less that must be organized in terms of authentication, identification, and authorization than when data is being shared between separate legal entities. In that case, agreements must be made about "Who is who?", "Who can do what on behalf of whom and under which conditions?", and "What do we do when things go wrong?" Working together in a network based on the T.R.U.S.T. Framework (see Design Section) may offer a solution here.

Data sharing has all the hallmarks of a two-sided market because of the many-to-many nature. In principle, all actors want to be able to interact with all the other actors at all times. Like, for instance, in telecom, e-mail, and payment. The advent of GDPR has led to the creation of many new platforms for sharing personal data with companies, as we briefly pointed out earlier on in this chapter. Initiatives in this area include Meeco, People.io, Cozy.io, MyDex, and Verimi. We know by now that the presence of multiple platforms leads to fragmentation for end users and that multi-homing can be a solution. But multi-homing on multiple platforms for sharing data is difficult. This is a consequence of having to manage multiple relationships and being faced with considerable onboarding efforts for the required trust.

Many middlemen have begun to address existing data-sharing needs. This has resulted in a multitude of platforms for sharing data, usually applying the hub model, where actors become customers of the platform. After this, they provide their data to other users of the platforms. They all do so under the same conditions, as determined by the middleman. For that to work, everyone must put their trust in the middleman.

But, as we saw, these types of platforms often result in a skewed data benefit balance because the platform is the exclusive owner of the data and uses that to its advantage. One way to restore the balance is to provide both actors with easy access to the transaction data. In essence, this means giving the two actors equal information about their mutual interactions and transactions. Digi.me[6] is a platform that makes it easy for users to gather their data with multiple social media in one location and, from there, share their data with others. The platform does not flood them with advertising.

Another strategy for giving users easier access to their data is the network model, which is increasingly common. For more than ten years, Dutch company Qiy[7] has been promoting its network model for the exchange of personal data, and in the business-to-business community, iSHARE[8] is an initiative aimed at facilitating many-to-many data-sharing relationships in the international logistical sector. In the network approach to data sharing, the data remain at the source, while trust and exchange between actors are standardized according to the

T.R.U.S.T. Framework. We discussed that in detail in the Design Section. In the case of iSHARE, the scope is limited to identification, authentication, and authorization, which is the foundation for any data-sharing solution where users are in control of their data.

Data sharing according to the network model is still in its early stages. Its adoption is a major challenge due to the chicken-and-egg problem mentioned earlier in this book. The network model can be seen as infrastructure, not of the “hard” kind, like roads, railways, cables, and transmission stations, but more of the “soft” kind, infrastructure based on T.R.U.S.T. Frameworks. The word infrastructure also implies a number of other things, including their general usage and the associated need to be suitable for different types of users (individuals, businesses, governments) and for many sectors (healthcare, finance, agriculture, logistics, energy, construction, etc.). The word “infrastructure” also tells us something about the business model, which is often based on not-for-profit, while facilitating the actors using it for commercial purposes. Examples are the GSM and Internet standards, both of which are the basis of large, commercial, global activities. Our road and energy systems are also vital to our wealth. Incidentally, infrastructure does not always have to be public to start with. There are examples of commercial parties that are now providing public infrastructures; for instance, WhatsApp neighborhood watch groups, but also the dominance of certain computer operating systems like iOS, Windows, and Android. The payment networks (with their own T.R.U.S.T. Frameworks) of Visa and MasterCard have by now turned into private infrastructure under public supervision; such is their importance.

If we can restore the data benefit balance, users will have more trust in the digital economy and will conduct transactions more easily and in greater numbers. This is an essential foundation of the already mentioned transactional Internet. By giving the actors access to their data, with their own copy or entry, the core of the benefits discussion is removed. We will have to organize that well and, as indicated earlier, the T.R.U.S.T. Framework may prove useful.

4.4 In Data We T.R.U.S.T.

Trust is a concept that is hard to capture, and there is no clear definition. In this book, we look in particular at trust in relation to transactions, transactional trust, especially in the digital domain. From that perspective, trust can be described as the extent to which two actors estimate that they will live up to each other's expectations. How big do they deem the likelihood of the transaction process meeting their mutual satisfaction? Will the buyer get the intended product or service, and will the seller be compensated as agreed? When parties don't know each other, they will not automatically trust each other, considerably reducing the chance of a transaction. The availability of profiles of the two actors is a condition for the transaction, their content determining whether or not there will be trust.

In the current phase of the Internet, the middleman, with the user profiles, plays an important role in creating this trust. From its position in the data triangle, it has access to all the information that is needed. It uses this first to create maximum trust between the actors, so that they then will be willing to use its propositions, and engage in transactions via its platform. As we saw, an onboarding procedure helps in that process. But also, reputation data—for instance, in the form of reviews—help increase trust. The two models in the Design Section of this book show how middlemen can provide the necessary trust, with each market situation demanding its own solution. As the Transaction Context Model shows, the risk of a transaction is the sum of the risks associated with the sub-processes of agreement, payment, and delivery. With its platform, the middleman reduces the perceived risk where possible, allowing trust to grow. And all of this with data.

> **At the moment, transactional trust is mainly organized by middlemen with their platforms. We call this institutional trust.**

Within the digital domain, transactional trust is created completely with data. In data we T.R.U.S.T., so to speak. In the current phase of the

Internet, the actors very much depend on middlemen who generate trust with their platforms. One could even say that trust is the core of what the platforms of middlemen add to an exchange between two parties. As such, transactional trust is still largely organized at an institutional level. Although transversal platforms play a specific role in facilitating this process, that also applies to longitudinal platforms like Amazon or AliExpress, even when they “merely” facilitate interactions. When a middleman is able to create trust among its users as an “institute,” it has an important competitive edge in the market. The question arises as to which factors actually bring about transactional trust. A question that is not easy to answer because trust is a subjective thing that is colored by emotions[9]. Again, the Transaction Context Model offers guidance. From the point of view of the middleman, there are three types of trust within a transaction context: relational trust, product trust, and process trust. Let’s have a look at all three of them.

Relational Trust

The foundation for transactional trust is laid in the relationship between the two actors involved: the buyer and seller have to trust each other. As we see in the Transaction Context Model, the mutual relation is one of the factors defining the context of a transaction. That relationship is dynamic in nature and the result of (recurring) interactions and transactions. After all, the more frequently we have mutual (positive) interactions and transactions, the more we will start to trust each other, and the more we will exchange in those interactions. So, the relationship follows the interactions.

> Relational trust is generated by recurring positive interactions, which in fact, shape the mutual relationship.

The middleman has the important role of creating the right conditions for this since both actors have to trust the platform for their exchanges. Reversely, the middleman wants to know which actors it is dealing with. We have already mentioned that the digital transactions that the actors perceive to have taken place directly between them, in reality, often take place via a middleman. For instance, both the host and the guest at Airbnb have a contract with the middleman, who, in fact, acts as one of the actors engaging in a transaction. When an actor does not fully trust the other actor, it can instead interact with the platform, enabling the transaction to happen anyway. It is important to have a clear picture at every transaction (step) of who the actors involved really are.

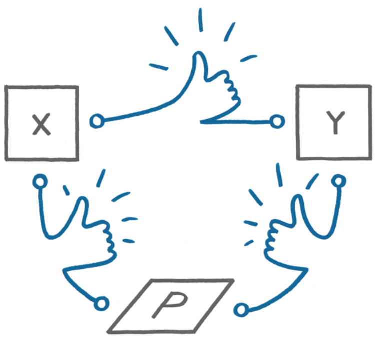


Figure 42. A middleman can facilitate relational trust between two actors or become involved as an actor itself.

Relational trust is the trust one actor has in another actor. That can be a person, but also a system or organization. The user profile, including the behavior and reputation data, is the basis for this. The actor is convinced that the other person will not just act out of self-interest, but will also respect its interest in the exchange. This form of trust is based on the choice an actor makes in favor of a certain scenario and is related to its expectation regarding the future behavior of others. Whether or not a transaction happens is ultimately up to the two actors. Independently of each other, they decide whether or not to do business together, based on whether or not there is sufficient mutual trust. In this context, trust can be seen as a person's willingness to have its wellbeing affected by the decisions of others[10].

The future behavior of individuals is difficult to predict because human interaction does not follow the ironclad laws of nature. That means that there is some risk in any relationship. When two people trust each other, they act like they know the future, transforming risk into trust[11]. If both actors decide on a transaction, they consider the risks involved to be acceptable. In other words, they accept the unpredictability of human behavior, a gamble that can have a positive or a negative outcome.

An example of the trust that one actor can have in another actor is when they leave their kids in the care of a sitter. The alternative is not to trust the sitter and stay at home. Actors don't choose a certain scenario lightly. They look for arguments to support their assessment about the competence and intentions of the other party. The parents in the example mentioned above will look for references concerning the sitter, and maybe interview possible candidates first. They build a profile based on the candidate's behavior and reputation.

> **Reputation data play an important role in the decision of whether or not to trust another actor.**

This is comparable to the way organizations are assessed: will they perform their tasks with integrity and in a professional way? Is there information available on the basis of which they can be assessed? When there are no experiences with the other party, and there is no known history, the decision whether or not to trust them becomes a difficult one. The concept of reputation plays an important role here. As we saw, digitization has also changed the meaning of that concept. In the past, the track record of an individual or organization existed above all in the minds of those whom at one time had dealings with them. Nowadays, reputations are stored digitally, as part of a user profile, making them easier to measure, and available to a broad public.

Earlier, we defined reputation data as an assessment of a person based on their user and usage data. The question here is not so much who an actor is, but more how it acts. Is it reliable, does it fulfill its obligations?

The platform provides the necessary ammunition for that by logging the online behavior of its users. In addition, a middleman can use peer reviews, which has users evaluating each other, actively building a large collection of reputations that encourage the exchanges between actors.

Platforms like TripAdvisor, Yelp, or Booking.com are based on this core principle. Thanks to the large number of reviews that other travelers have posted, it is easy for other potential customers to assess the quality of the accommodation and make their choices. Another example is the Chinese government, which will use the behavior data of all Chinese citizens to set up a national reputation system—the Social Credit System— to give the authorities more insight into their behavior[12].

There are also other mechanisms the middleman can use to increase the trust on its platform, like the quality of the technology, the platform design, and its implementation. They can also use all the procedures, protocols, and other checks that are executed during the exchange process. Things like the professionalism of the employees and the business culture also play a role. Has the company hired the right people, and to what extent are they committed to the mission of the platform? The influence of the middleman on this type of trust is relatively large. If it manages to organize the processes taking place via its platform well, the actors will experience it as secure.

Product Trust

Even when the two actors have enough trust in each other and in the middleman, we are still not there. The next question is, do they both have enough trust in *what* is being exchanged during the transaction? For the buyer, that means the product or the service, the delivery. For the buyer, it means that which it gets in return, the payment. Often, payment takes place using money, but data are also increasingly used for payment.

Let's start with the first actor, the buyer. How does it decide whether it has enough trust in the quality of the product or service? During the first phase of the buying process, the discovery phase, it searches for alternatives for its planned purchase. As we saw in the previous chapter, the potential buyer can use all kinds of platforms that provide it with the necessary information: from search engines like Google and independent review websites, to longitudinal platforms like Amazon, which themselves take care of this step in the customer journey. The potential buyer will combine that knowledge with other information that it has stored, knowingly or not, from its own experiences or those of others. The marketing of the various vendors will also do its magic in this phase. And it all leads to a choice in favor of a certain product.

> While money is neutral and disconnected from the user in question, data and the person using them for payment are directly connected.

And then there's the second actor, the seller. How does it decide whether or not to trust the payment? If it is being paid with money, its value is determined by law. The government has defined a number of payment methods that, under certain conditions, have to be accepted in the trade process. The trust in money has nothing to do with the relationship between the two actors and plays a more distant role in the transaction process. In Section 4.5, "A short history of money," we take a closer look at the creation of money and the crucial role of trust in its development.

In recent years, cryptocurrencies like Bitcoin, Litecoin, and Ethereum have also made an entrance. Strictly speaking, they are not currencies because no governments are involved. But that does not keep certain groups of actors from trusting them as currencies, even though they are not legal tender.

Earlier, we mentioned that data are also increasingly used for payment in transactions. That has a dynamic of its own: while money is neutral and disconnected from the user in question, data and the person using them for payment are inseparably linked.

CASE

The rise of bartering

A second alternative that has made something of a comeback thanks to the Internet is old-fashioned bartering. In principle, on the web, everything that is on offer is accessible to everyone, making it much easier to find a good match than it is in the physical world. That is why all kinds of complementary currencies have been developed, both with a purely commercial purpose and with a social intention. In Amsterdam, a company like Qoin has been developing alternative forms of money since 1993, the so-called *community currencies*, which exist in parallel with regular money to fulfill the needs of certain communities; for instance, by connecting economic relationships to the social domain. These currencies exist both in digital form and on paper. They are customized and are often a combination of a reward program, an investment, and a card system. For instance, a currency called the "Makkie" is used in the Amsterdam Oost neighborhood, with one Makkie representing one hour of mutual services or community work. Makkie notes can also be used to get a discount at stores, restaurants, or museums in the neighborhood[13].

In Switzerland, a bartering system called the Wirtschaftsring (WIR) is an accepted element of the official economy. The WIR system, in which companies exchange or barter goods and services, appears to have had a stabilizing effect on the monetary economy. In times of economic progress, the WIR system shrinks, and everybody returns to the regular monetary system.

> **"Community currencies are alternative forms of money that connect economic relationships with the social domain."**

These complementary forms of barter often emerge in regions or communities in the financial periphery, which find it hard to keep up with the pace of globalization, and which are looking for new economic development strategies[14].

In addition to these community currencies, also other types of barter emerge. On a platform like the Dutch website ruilen.com, all kinds of products are bartered. For instance, Puma sneakers are traded against surfing gear of equal value. It may take some time, but when the platform has a big enough reach, a good match will be possible. In times of crisis, the fact that no money is used for payment has its advantages. Money is tighter, and there is a surplus of labor. So, it's not so strange that, under such circumstances, goods get a new lease of life.

To determine the value of data as a currency, the seller of goods or services will need to know more about the potential buyer offering the information. Identity platforms can play a role in that process. But even if the seller knows who it is dealing with and is better able to determine the reliability of the data, that doesn't mean there aren't potential pitfalls. This is because the buyer, as the second actor involved in the transaction, is also entitled to its personal data. This greatly impacts what the seller can ultimately do with this bartering agent, touching on topics like privacy and related legislation.

Process Trust

Finally, the transaction process itself plays a role in creating transactional trust. Earlier, we defined transactions as the three sub-processes of agreement, payment, and delivery, with the two actors playing a fixed role throughout the entire session. In that context, process trust can be seen as the trust that both buyer and seller have in the three sub-processes. To begin with, they must both trust the terms under which the trade is made; in other words, the agreement. This agreement is always explicit because there are rights and obligations for both parties involved. The jurisdiction within which the transaction takes place provides the legal framework for the contract and, in the background, plays an indirect role in creating process trust.

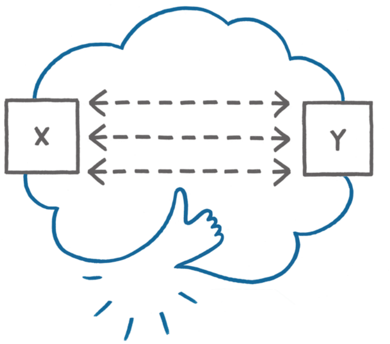


Figure 43. Process trust.

The seller not only has to trust the value of the payment, in the form of money or data, it also needs to be sure that the payment will make it to its account in a secure way. The same goes for the buyer making the payment. It needs to be sure its money makes it to the seller's account. In other words, both actors have to be able to trust the payment method that is used.

As we saw when discussing the Transaction Context Model, a middleman or supplier can increase trust in this area, for instance, by offering multiple payment methods.

Finally, both actors have to trust that the product or service will be delivered in good order and at the agreed time. This sub-process of the transaction varies per case. When it is a digital product, such as an app or music, delivery can take place within a few seconds. When it is a physical product, there are various alternatives. The company can have its own delivery service or use the services of others, or the buyer can go to a pick-up point to collect the product.

Trust takes years to build, but seconds to break. That is why having a good reputation is a valuable thing. That may be a cliché, but it is true, even in a literal sense. This is because, for both people and organizations, the trust that others have in them represents value: it makes their actions easier to execute and increases their effectiveness. For example, if a hotel gets several bad reviews on Booking.com, the owner will have to try to correct its mistakes, and that takes time and money. Trust between actors should not be taken for granted. Often, all kinds of things must be taken care of before a transaction can take place because economic value is exchanged, and there are risks involved for both actors. In the case of institutional trust, the middlemen are the ones removing the obstacles to allow transactions to take place. The greater the perceived risks for the actors, the more data the middleman will have to collect in order to organize trust, and the greater the added value that it delivers.

4.5 Trust as a Two-sided Market

Every economy is built on the trust that the players have in each other. That is nothing new. What is changing quite a bit is the way in which that trust is created. Within the digital domain, trust takes on the form of bits and bytes—data, as we know by now. We also saw that middlemen, from their position in the data triangle, play a crucial role in the creation of trust. In this section, we show that the current institutional trust provides the basis for the digital economy, but that it is a solution that also has its limitations. It turns out that it is quite difficult for an individual platform to build trust on a large scale and maintain it. This results in a fragmented trust market, resulting in high transaction costs for all economic players. Within the digital domain, trust is much easier to create than it is in the physical world because here, trust manifests itself in the form of personal data or user profiles. These can be shared under certain conditions, making it relatively easy for trust to be reused. In theory, it can even be done on an infinite scale, which is not possible in the physical world. Transversal platforms can organize that trust for other platforms, enabling them to grow quickly and fueling the engine of the digital economy to run at full capacity.

How can a middleman organize trust in such a way that the two actors are willing to engage in a transaction via its platform? How can it ensure that there is trust between the actors and that the two of them trust the product being exchanged, the delivery, the payment, and the transaction process as a whole? To understand that, we need to look at the opposite of trust: risk. Earlier, we saw that, when an actor chooses to proceed with an interaction, it transforms risk into trust. It assumes that its decision will have a positive outcome and perceives the risk to the contrary as acceptable. When there is no or insufficient trust, it is up to the middleman to map all the possible risk areas. By then mitigating them one by one, trust can emerge. In addition, if there is not much trust to begin with, the costs of creating trust are higher yet.

Let's go back to the buying process. What risk are the actors willing to take during this process? When it comes to the first step, discovery, the risk acceptance appears to be relatively high. An actor will probably be prepared to take some risk when it is looking for information about possible alternatives for the purchase that it has planned. The same thing applies to the second step, selection. When a potential buyer makes the wrong selection, that may be a waste of time, but the consequences are not that serious since there is no financial risk. It is only during the next steps, when two actors enter into a transaction, that things become more serious. Once a transaction has been concluded, that is it; you are both stuck with the outcome, which means that neither party is willing to run any risks at that stage. Because of the legal component of the transaction steps, there is a low-risk tolerance on either side because the consequences of making a mistake in assessing the other party are the greatest. So, the middleman will have to do whatever it can to limit the risks that the two actors perceive during the transaction steps. And because the risks are the greatest in this phase of the buying process, it will have to incur considerable costs to create the necessary trust.

DEEPDIVE

Trust as the engine of a national economy

There is even a relationship between the level of mutual trust and the effectiveness of a national economy, according to the American sociologist, political scientist, and philosopher Francis Fukuyama in his book *Trust: The Social Virtues and the Creation of Prosperity*[15]. While in this book, we focus on aspects of trust that are conditional to bringing about transactions, Fukuyama adopts a social perspective. He tries to answer the question of why some countries are economically speaking more successful than others. According to Fukuyama, the actions of homo economicus are above all rooted in its culture. He concludes, therefore, that the culture of a country determines how the market in that country functions. Success is explained above all by the level of mutual trust between citizens because that is an important condition for cooperation. Fukuyama draws a distinction between high-trust countries, like Germany, the US, and Japan, and low-trust areas, like southern Italy, France, and Hong Kong. Trust is expressed in the legal system and in the power structure within a country, and especially in the extent to which citizens enter into mutual relationships on their own, with the aim of generating mutual benefits, which Fukuyama calls a "spontaneous association ability." Italians, for instance, trust their relatives above all, resulting in countless small family businesses. In German culture, however, the most qualified person is hired for a job, regardless of who their relatives are, because of which business can grow much more there. The extent to which citizens work together spontaneously for a common goal determines the size and structure of the businesses and the flexibility of the economy. While a high level of mutual trust will reduce administration costs and allow people to do business more efficiently, a relative lack of trust will lead to corruption and bribery. In some low-trust countries, like France and South Korea, the government intervenes, creating huge state companies. However, the success of such an intervention depends very much on the economic competences of the government in question. And although there has also been some criticism of Fukuyama's book—for instance, a relative lack of attention to medium-sized companies—he certainly managed to demonstrate the crucial role that trust plays in determining the success of an economy.

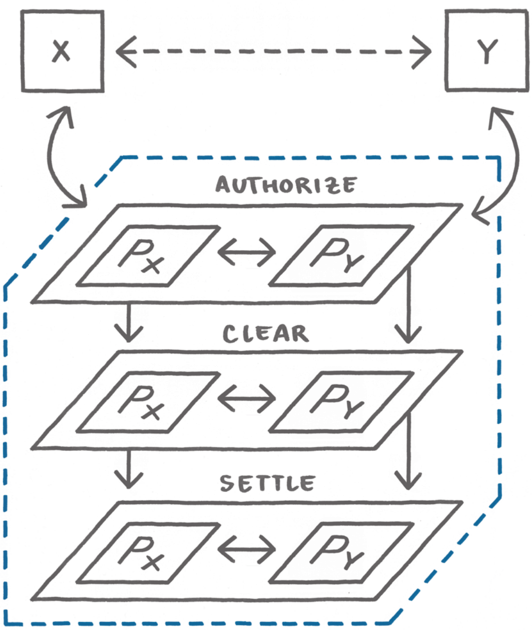


Figure 44. The transaction risk acceptance curve.

> **Mobile technology enables consumers to get control of their "own" data.**

The level of mutual trust between actors acts as a coordinating and balancing mechanism. If mutual trust is high, exchanges do not have to be recorded in detail. The size of the contract that is required is a good indicator of the level of trust between two actors: when there is little trust, huge contracts are often needed in which the conditions of the exchange are described in great detail to make sure that trust is created. So, distrust makes transactions a lot more expensive. On the other hand, when there is trust, transaction costs can be reduced considerably.

> Transaction costs are the result of dishonesty, opportunism, and mistakes during an economic exchange.

In that light, the theory of Nobel laureate Coase (1910)[16] provides valuable insights. In his vision, transaction costs are the result of dishonesty, opportunism, and mistakes during an economic exchange or a transaction. According to that theory, businesses exist because of these inefficiencies associated with transactions. Businesses continuously have to make sure that their own administrative costs are in line with the reduction of the transaction costs that they realize in their market. Although there are critics who think that there are other reasons for organizations to exist[17], it appears plausible that Coase's theory at least applies to businesses, or parts thereof, that are directly connected to conducting transactions.

According to Coase's theory, incidentally, it is crystal clear that the Internet can considerably reduce transaction costs and that that has a huge impact on the economic landscape[18]. At the moment, only a fraction of those potential benefits are realized. But the trend is unmistakable: we now conduct transactions via platforms and mobile devices that used to take a lot more than a few clicks, including renting a bike, car, or house or ordering food.

Because digitization condenses and reduces the number of links in value chains, the risk of errors is also reduced, which automatically reduces transaction costs as well. On the other hand, people still see the web as being riskier than the physical world when it comes to conducting transactions; and middlemen have their hands full trying to remove risks and create trust between actors. So, in the current phase of the Internet, we still rely very much on institutional trust. When that is no longer necessary, the potential of transaction-cost reduction within the digital domain can really be achieved. During the phase of the transactional Internet, this can become a reality. Institutional trust will then largely be replaced by infrastructural trust.

We will come back to this in Chapter 5.

Banks have been operating in the trust market for ages. As a sector, they enable all parties to transfer money to each other, including to customers of other banks. That is possible because there are agreements between the banks in accordance with the T.R.U.S.T. Framework we discussed earlier. In the physical world, we think it's completely normal that not all stores have their own payment cards, but that there are payment methods that you can use almost anywhere (transversal). So, you could say that we have experience with trust mechanisms, both among banks and between customers and their banks. How was that process organized over the years? If we can understand that, there may be important lessons we learn for the digital domain.

Transactional trust is complex, turning it into a specialized intermediary function. However, in practice, we see that many platforms engage in it, for instance, the numerous fintech startups. That is special because it is complex and time-consuming for a platform to determine who the user is at every step of the transaction process, and to what extent it can be trusted.

This requires the creation of a hefty registration process, which is often at odds with a business's growth target. After all, in the digital economy, upscaling is the magic word. That goes for nearly all types of platforms: the quicker you are able to dominate a market, the better. This growth is hampered when transactions are part of the proposition because there must be certainty about the identity of the two actors involved. People visiting a platform can easily leave in the middle of the registration procedure, especially when physical copies of identification are required. Consumers want things to be easy and are often not prepared to complete such a time-consuming process, especially not for relatively minor transactions that occur less often. That means that platforms with a simple registration process have greater growth potential.

A market becomes fragmented when all providers start their own onboarding mechanisms and fail to let their users interact with other platforms' players. As a result, the costs of the individual onboarding mechanisms are high in relation to user conversion. As for the user, it is less useful when a registration only gives it access to a limited part of the market, while the development of the market as a whole is lagging.

> **In today's fragmented market, consumers have a wallet brimming with cards, a head overflowing with passwords, and a mobile phone stuck with apps.**

And that is exactly what is going on: at the moment, almost every platform has its own trust mechanism or authentication system. When a user wants to post or read messages on Facebook, it first needs to complete the registration process. If the same person then wants to buy a book on Amazon, it has to go through another identification process. And if it wants to respond quickly to a friend's tweet, it needs to log onto Twitter, using a different protocol. The result? Because of the thresholds that are in place, it is hard for the middleman to upscale its platform. They all try to impose a certain behavior on end users for the functionality that they provide. And consumers have a wallet filled to the brim with cards, a head overflowing with passwords, and a mobile phone that is literally getting stuck with apps. The result is less security, especially when people end up using the same predictable passwords, and data leaks almost automatically affect multiple digital identities.

It would be a lot easier for all parties if there would be one standardized digital profile, comparable to the one official passport we have in the physical world, which gives us access everywhere. We think it is completely normal not having to get out a different passport with a different color, depending on our destination. The chaos that that would create in our administration is comparable to the multitude of passwords and login codes that today's digital consumers have to deal with. In an ideal situation, that friction is removed by a *trust platform*. How would something like that work? It could be as follows. Consumers have to register only once, after which they can use that registration to use all other platforms. All transactions could be conducted without friction and on a truly massive scale. Think of the way we use our bank card to pay in the physical world. We don't need to register at every store before being allowed to pay. The same is possible within the digital realm, provided the infrastructure is organized in such a way that the digital profile of actors in the economic process is registered and made available in a secure way. Such a transversal reuse of profile data can help tap into a whole new source of economic potential. The Web3 movement, where users start with controlling their data, could be a first and decisive step in this direction.

Nearly all platforms, from Twitter to iTunes, have an onboarding procedure, with the first step consisting of a one-time identification. This gives the actor access to recurring use of the actual proposition. As we saw, in strategic terms, that first step is crucially important. If a lot of potential users leave during this phase, they will never get to know what the service is all about. As we hinted earlier, to make its proposition accessible to as many interested people as possible, the middleman will have to make the onboarding process as smooth as possible. To that end, it can use specialized trust platforms that already make the digital identities, IDs for short, available. Parties like Facebook, Google, and Twitter operate on that market, as well as a growing number of banks and governments, with the logins they provide.

The core activity of a trust platform consists of organizing trust, by registering and authenticating users, in such a way that this can be used on a large scale. Two user groups are serviced in that process: the first group is formed by the consumers or end users, who want access to as many products and services as possible in an easy and secure way—whether it is to post a tweet, purchase a game, or order their weekly groceries. The second group consists of the organizations that provide the services or products in question; when purely talking about using identity data, they are called the *relying party*. As such, the trust platform has an asymmetrical proposition because both groups need their own service features. On the end user's side, a user-friendly registration system will be offered with which to determine their identity. Potential users will only be willing to provide their personal information if the trust platform itself has a solid reputation. Can it boast a proven track record to show that it is able to handle privacy-related information with care? And that the data won't be out there after a hack? In addition, the end users will want to know their efforts will be rewarded sufficiently. Will they get enough in return for their registration? How often do they expect to use it?

On the other side of the market, the clients of the user data, the relying parties, need a proposition that matches their specific needs. It needs to be one that serves their ultimate purpose: making it as easy as possible to scale up their business. Of course, the trust data themselves must be reliable. Next, it must be easy to integrate these data flows—for instance, names and delivery addresses— into their own process, like the onboarding and transaction steps in their own value chain. For the end user of the platform using the data, the customer journey has to feel like a logical and comprehensive process, with as few steps as possible. In addition, the trust platform has to make sure that the *relying parties* are reliable players, with whom it is safe for their end users to do business.

As we saw, an asymmetrical proposition needs cross-sided network effects. This kind of platform is harder to scale because the middleman needs to create enough reach on both sides of the market, with two different propositions. If a middleman manages to create market volume on one side of its market, an important condition for the other side of its market is fulfilled. Trust platforms also often adopt a winner-takes-all strategy, trying to dominate the market. The value of the trust they generate not only depends on its quality, but also on the scale with which they are able to provide it. In fact, each additional user on either side of their market increases their value.

> The value of trust not only depends on its quality but also on the scale with which a platform manages to provide it.

Middlemen can have the ambition to dominate the market on their own or work together with other providers. In other words: they can use a hub strategy or a network strategy. For starters, organizing trust using the hub model is clearer because the middleman is in control of everything. Using a network model means that the mutual trust between the participants has to be organized first. This means that middlemen using the hub model are able to organize their own T.R.U.S.T. Framework, while the participants in a network model first have to reach an agreement about the overlapping part of their individual T.R.U.S.T. Frameworks. When they manage to do so, a network effect kicks in because each participant adds their customers to the network, creating exponential growth in the overall reach.

There are two types of service providers operating in the trust market with their transversal platforms: *payment service providers* and so-called *identity service providers*. Widely accepted PSPs, who enable digital financial transactions, first must organize the trust between actors, creating value that can then be reused in other platforms. Credit cards like Visa and MasterCard, both organized in accordance with the T.R.U.S.T. principles in a network model, are well-known examples of those payment methods with global coverage. Cardholders can use their cards to rent cars worth tens of thousands of Euro in millions of places around the world. All they have to do is show a plastic card. Both Visa and MasterCard have managed to organize trust on a global scale between parties that are essentially total strangers. A remarkable accomplishment, when you think about it. Especially when you realize that the process is based entirely on data. American Express, Diners Club, and JCB are doing the same thing, but with a hub model.

The relatively new category of identity platforms also organizes trust, but without the payment step. They do so by enabling other platforms to reuse user data, and in doing so, enabling longitudinal platforms to simplify their onboarding process by letting them benefit from the trust that the identity platform already has among its users. When trust can be used by other platforms, everyone benefits. Transaction costs will be lowered and, in an ideal world, disappear completely, allowing transactions to take place without any obstacles and in the blink of an eye. Examples of identity platforms are government platforms like DigiD or Neue Personals Ausweis, banks with initiatives like the separate but similarly named Swedish and Norwegian BankID, but also social media companies like Facebook and Google. Especially since Covid passports, the identity market has accelerated, notably in Europe with the eIDAS2 regulation[19] on digital wallets.

4.6 Payment Platforms

From its inception, the payment market has been interlinked with trust. That is obvious because, in a payment, the parties want to make sure that the correct amount is transferred to the right person or organization. For centuries, scale has also played a major role in this: the more merchants accept your bag of coins or payment card, the more valuable the payment method is. And vice versa, the more often a payment method is used, the more interesting it is for merchants. As such, currencies and payment methods have been expressions of trust since the dawn of time.

The Transversality of Payment Platforms

The payment market has a structure of its own. It is a very complex system consisting of numerous platforms. There are many providers, like banks, credit card companies, and providers of digital payment propositions. Each has its own platform business, using either the hub model or the network model. Underpinning this multicolored landscape is a basic infrastructure enabling the execution of all the payments that the individual providers facilitate. It also allows account holders of bank A to transfer money to account holders of bank B, worldwide.

DEEPDIVE

A short history of money

Ever since people started thinking about ways to make their lives a little more comfortable, there has been trade. You have A; I have B—how can we both benefit without one of us losing out? At first, there were complex bartering arrangements. For instance, a person owning a cow could trade parts of that cow with other people, against a chicken, milk, bread, or eggs. This method had its disadvantages because the value of different products wasn't static and the synchronization of needs was not a given. When demand for eggs increased, their value would increase. If demand fell, on the other hand, their value would decrease. In addition, many goods, like eggs or milk, had a limited shelf life. So, it was time for something new, a trading mechanism in between that kept its value and didn't spoil. Salt, for instance, matched those criteria. In Roman times, salt was scarce and very much in demand. Caesar's soldiers were paid in salt, which explains why our word "salary" comes from the Latin word for salt ("sal").

But salt, or other alternatives like teeth or shells, also weren't perfect, and precious metals became an ever-more popular solution. They were almost impossible to fake, the coins wouldn't spoil, and they had a fixed value based on their weight. In addition, they were relatively easy to transport. Around 770 BC, the Chinese were the first to use bronze as a currency. And a few centuries later, Alexander the Great wasn't only a highly successful conqueror, he also was the first one to government-issue gold coins by stamping them to ensure their value and quality. For centuries, precious metals were the only alternative for physical bartering, probably until about 700 AD, when the Chinese started small-scale experiments with paper money. It was only in the fourteenth century that paper money became an accepted payment method on a wider scale. In the West, people continued to haul bags of heavy coins around for centuries. But at some point, people got fed up with the ongoing robberies and looting of one's silver or gold. And so, in Amsterdam, the first banks appeared that stored people's precious coins and gave them a "bill of exchange." People could later come back to the bank and convert the bill back into coins. However, the bills were so convenient that few people came back to collect their coins. The bills themselves started being used in trade, much like today's banknotes. Initially, the value of banknotes was linked directly to the intrinsic value of the associated piece of gold that was stored elsewhere. The "gold standard" has long served as a basis for trust in the international monetary system. It was how the exchange rates of various currencies were determined. So, the fluctuations in the gold market had an indirect effect on the prices of goods and services. Where the gold supply initially covered the amount of money in circulation completely, over time, that link was later abolished. With the "gold core standard," only 40% of all notes in circulation were covered. Followed by that was the "gold exchange rate," in which the value of, for instance, the Dutch guilder, was linked to the American dollar, which in turn was linked to the gold standard. Ultimately, the gold standard was abandoned completely in 1971. An important consideration was that the gold supply could not grow at the same pace as the economy, making it scarce, and it had a deflationary effect. Abandoning the gold standard meant that money increasingly became a means for governments to regulate the economy of a country or region, just by turning on the printing press, if necessary. The value of the currency became highly dependent on the level of acceptance of international trade partners. And again, trust played an important role. In our digital age, a new chapter in monetary history is being written by Bitcoin and, more recently, by stablecoins and Central Bank Digital Currencies (CBDC). Money = data = trust.

How did the banks manage to create a market standard on such a massive scale, along with payments of any size to take place, nationally and internationally? The government plays an important role. No institution can just put the word "bank" in its brand name before being admitted to the "banking franchise." In fact, the banking world is a government-created system, an institutionalized and government-facilitated cartel. You can call it a franchise, but it is more of a cartel that is allowed to exist under certain conditions. New members can join when they meet the transparent admission requirements. For consumers, the word "bank" serves as a trust anchor, informing it that it is safe to conduct financial transactions with such an institution and to store their money there. To make that possible, separate national regulations apply in the form of the Banking Bill[20].

The shared global infrastructure between banks and central banks ensures that a settlement takes place after every payment. This closed system was created specifically for that purpose with customized telecommunication technology, long before the arrival of the Internet. For centuries, governments and banks have been building the trust that allows payment transactions to take place securely. Each platform wanting to facilitate a transaction ultimately has to deal with that infrastructure, which in turn consists of a stack of platforms. This is why it is called the *payment stack*.

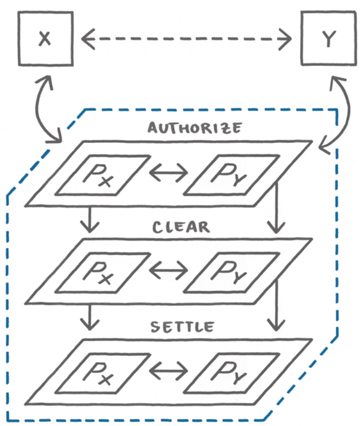


Figure 45. The payment stack processes every payment on three levels

How does this work? With the aforementioned payment stack, the processing of a payment is handled on three levels. First comes formal payment *authorization* by the actor involved. That happens the moment both actors agree to the transaction. It sets a process in motion on the basis of a set of rules that describe how the payment is to be handled. The sets of rules have been laid down in frameworks of agreements. The second step is the *clearing* between the two banks involved, with the reciprocal positions at the national bank settled via an *automated clearing house (ACH)*. In the Netherlands, for instance, all payments between banks are processed via Atos Worldline (previously Equens, and before that Interpay). Finally, at the highest level, the settlement between national banks is processed, via the Target2 system of the European Central Bank. It is important to understand that there are multiple platforms at each level, as hubs and/or as networks, which together serve as the interbank payment system. Two book recommendations for further reading *The Payment System* by Tom Kokkola[21] provides a very good overview of the Eurosystem, and *The Pay Off* by Gottfried Leibbrandt and Natasha De Teran[22] explain the worldwide payment system in an accessible manner.

Reading tips: *The Payment System* by Tom Kokkola and *The Pay Off* by Gottfried Leibbrandt and Natasha De Teran

At the moment, only the first step in this process takes place in real-time. That is, the moment a payment is approved—for instance, via a payment terminal—the amount is immediately deducted from the spending limit of the party making the payment. This is confirmed immediately to the receiving party so that it can deliver without wasting time. In a sense, that guarantee that it will receive its money represents as much trust as the money itself. This is because as a rule, the supplier will get the money a day later—and nowadays more and more instantly. The account of the receiving party is credited within a few seconds of the transaction being approved.

The consecutive steps in the process, how banks handle their mutual positions, can vary. There are *net* and *gross settlement*. In the case of net settlement, the payments initially take on the form of a ledger, and the banks settle their mutual differences periodically, without actually moving money back and forth. In the case of gross settlement, the money is exchanged with every payment. The payment transactions, in which the rights and obligations of both parties have been recorded, are the basis for all follow-up steps. At all levels of payment processing, the identity of both parties must be established. Are we still dealing with the same actors? Because this involves the processing of transactions at the data level; all the parties involved need to be identified, both buyers and sellers, as well as the banks and central banks themselves in their mutual settlements.

> **All platforms that facilitate payments are linked to the payment stack because of reach.**

As we saw, more and more platforms are preparing themselves to facilitate transactions within the digital domain. All those platforms are in some way linked to the central payment stack, which serves as a trust platform by proxy by collecting value and making it accessible transversally, allowing payment transactions to take place in a secure way. All platforms that play a role in facilitating payments use that jointly accumulated value. Payment platforms make that transversal value available to users as well as other platforms.

A credit card is an example of such a platform. Each credit card company, under its own brand name, provides a method that is aimed to facilitate payments in a convenient way, making use of the basic infrastructure and accumulated trust of the worldwide banking world.

Diners Club was the first credit card as we have now come to know them. The company was founded in 1950 and made it possible for its cardholders to pay their bills at associated restaurants once a month. It turned out to be a relevant proposition that solved an existing problem for two parties, as one of the co-founders himself had experienced. The story goes that founder Frank McNamara wanted to pay for a business dinner and had forgotten his wallet, which gave him the idea for Diners Club. By charging the account holders an annual fee of 5 US Dollar, and asking restaurant owners for a 7% fee, the platform was able to increase the number of cardholders to 40,000 within two years.[23] That made the card increasingly interesting for restaurant owners, and on the side of the market, the company was also able to expand its reach more and more. The network effects continued, and by the mid-1960s, there were 1.3 million cardholders. American Express followed in 1959 with its own card, which was rooted especially in the travel world. Both parties applied the hub model, focusing on making their own closed network as big as possible. Later, competitors Visa and MasterCard both developed toward an open system, for which cooperation between banks is a condition, which is why Visa and MasterCard adopted the network model, each with its own "scheme" as the basis for cooperation within their platforms.

Credit card companies build their own transversal platforms on top of the payment stack.

Credit card companies have to deal with the platform dynamics of two-sided markets in full, like generating cross-side network effects. After all, consumers only want to purchase a credit card when it has enough merchants, while sellers will only find the proposition interesting when the pool of potentials buyers using the payment method is large enough. To make that happen, credit card companies use both the hub model and the network model.

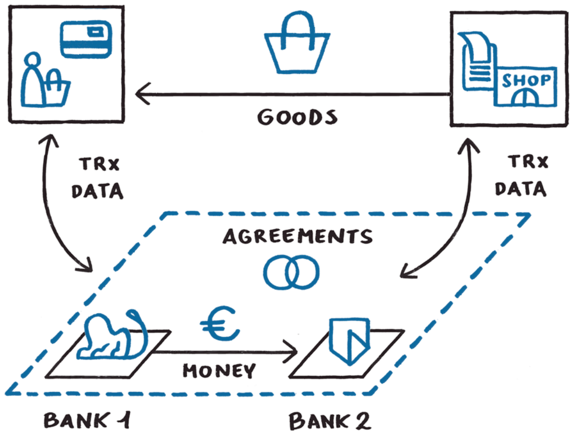


Figure 46. Credit cards as a network model.

Figure 46 shows how the network model of Visa or MasterCard operates. On one side, there is actor X, the buyer, wanting to make a payment. This is done via a so-called *issuing bank*, a local bank that issues MasterCard credit cards. On the other side is actor Y, the merchant, which may be an account holder at another bank, the so-called *acquiring bank*. The latter has to collect the payment from the issuing bank and then pay the merchant. Underneath it all is the payment stack mentioned earlier, which ensures that the positions between the two banks are settled.

To be able to process the aforementioned payment, Visa and MasterCard provide access to account holders of the issuing banks, mitigating the financial risk of the acquiring bank: the transaction is only completed when there is enough credit. They charge each other so-called *interchange fees*, the leading principle being that the acquiring bank passes a part of the merchant fee it collects on to the issuing bank. Since 2015, this has been subject to strict European rules. So, the banks operate as competitors, each with their own banking platform, and work together in a network on specific elements of their value propositions. This increases the added value of the service for the end user considerably. The banks can also work together in a technical sense, for instance, to make sure that competing cards can use the same terminals. That may seem obvious, but in countries like Turkey and Indonesia, stores often have several terminals from different banks. In practice, there are different ways to organize such an open network structure. But this always requires a T.R.U.S.T. Framework or *scheme*, detailing which data is exchanged under which conditions, like the interchange rates and transaction data. It can also be a partially shared infrastructure, like the network, the payment terminal for the stores that meets certain agreed specifications, or a combination of the two.

CASE

Visa: Governance as a business model

Credit card company Visa is organized according to the network model, with which it has managed to create a massive reach on both sides of the market. Organizing and managing such a large-scale collaboration is an art in itself. Time and again, it turns out that having a system of agreements detailing the conditions for creating a consistent user experience are key to the success of a joint value proposition. Visa has even decided to make governance its core business. In 2008, in the middle of the financial crisis, the organization issued shares with a total value of 17.9 billion US Dollar, the largest to date in the US. Visa followed the example of its smaller competitor MasterCard, a company that had its IPO two years earlier and managed to collect 2.4 billion US Dollar.

In the book *One from Many: VISA and the Rise of Chaordic Organization*[24], founder and later CEO Dee Hock (1929) tells how they got to that point. Hock deliberately built his organization as a decentralized and "chaordic" organization. Chaordic is a combination of the words chaotic and orderly. It represents a network organization where principles such as self-organization, shared goals, and proportional distribution of power are core elements. According to Hock, before the American IPO, the company was nothing more than a collaboration of about 13,000 American and 8,000 European banks carrying Visa cards.

The IPO drastically changed the nature of the company. While, in the original model, banks organized the governance together, with IPO, they essentially sold their authority over the platform. In the new situation, banks are customers of the "new" organization, the aim of which is to orchestrate the payments between competing banks within the Visa network in a secure manner. The banks have an account with Visa and Visa takes care of the settlement—for a small fee—making sure that everything runs smoothly for the end users. In essence, the customer of the customer is facilitated. The question is whether this is in the banks' interests in the long term. To what extent do the organization's interests run parallel to their own wishes? Who is ultimately in contact with the end user? So far, it is by any standard a successful operation: in 2018, the company reached a market capital of 145 billion US Dollar, making it the sixteenth largest company in the world[25].

The Payment Ecosystem Is Expanding

Before the digital age began, the payment market was pretty simple. Everyone knew how to use a payment check, and they knew how everyone worked in accordance with generally accepted market standards. However, traditional banks failed to respond sufficiently to the new opportunities presented by the Internet since the 1990s, as a result of which end users were insufficiently, or not at all, served in the digital banking domain initially. Innovative fintech companies seized the opportunities they saw and have been rushing into the market in large numbers to this day. In addition, banks face increasing competition as a result of regulations. Europe has the ambition to become one big payment market, the Single Euro Payments Area (SEPA). That means that national payment providers will no longer be shielded from foreign competition. The Payment Service Directives (PSD1 and PSD2) detail the rights and obligations of users and payment product providers. The aim is to remove any thresholds for new entrants[26]. These new entrants often are fintech startups and other digital platforms without a banking license. After the first directive from 2007 and an update in 2009, PSD2 has been in force since 2016. It had to be implemented in local member state legislation by January 2018.

> The PSD2 stipulates, among other things, that banks must give external service providers access to information on bank accounts, provided the account holder gives its consent.

The most important implication of this is that banks must give external service providers access to information on bank accounts, provided the account holder gives their consent. Third parties can use that access for innovative services; for instance, in the area of payments or by aggregating account information and combining the information of multiple bank accounts at different banks into a coherent overview. This behavior data can, in turn, yield valuable information for new digital services. Third parties also must be able to initiate digital payments on behalf of customers. Banks all over Europe are obliged to facilitate this new functionality for them. New entrants will be subject to less strict conditions to get a license than established banks. The technical conditions under which that information exchange can take place have yet to be finalized, even though it has been in effect since the start of 2018[27].

What does this mean for banks? In a negative scenario, other parties take over the payment functions and with them the relationships with the end users, reducing the role of the banks in securing and moving the money. Proactive banks seize the opportunity by offering access to accounts to competing banks and by working together with new providers.

The existing practice is that numerous fintech companies build their own castles—meaning their own platform—on top of the payment stack. While traditional banks are usually organized according to the network model, most newcomers prefer the hub model because they all have the ambition of becoming a market leader with their solution. We know by now that that is a challenge. In India, the United Payment Interface (UPI) was introduced. This is a standardized specification of the joint banks, with which their customers provide third parties access to their bank accounts. Thanks to that standardized link, fintech players have access to the entire customer network of Indian banks, which solves the problem of fragmented reach. From 2018, for example, it has been possible to conduct WhatsApp-based payments via UPI.

> “ **Innovative fintech companies storm the payment market, and they all provide their own solutions.**

As early as 1998, the online payment platform PayPal was one of the first to come between banks and their account holders. Operating according to the hub model, they clearly had the ambition to become the biggest. Co-founder Peter Thiel says that, in the online world, only monopolists who manage to set a market standard have a right to speak. “Competition is for losers,” as he puts it[28].

The first step was to get end users to register with their e-mail addresses and credit card details. In a sense, PayPal used the reach of credit cards to open PayPal accounts, which could be seen as a first generation “access to the payment account.” At the same time, on the other side of the platform—the merchants—as many sellers’ International Bank Account Number (IBAN) details as possible were registered. By offering consumers in the EU a direct debit as an alternative to expensive credit card payments, PayPal was able to settle the mutual transactions for the 200 million account holders more cheaply itself, so, outside of the traditional banks. By now, PayPal has also officially become a bank because it holds customer deposits, which means the organization is subject to banking regulations. Because of its large reach, PayPal is able to operate transversally, and more and more buyers and sellers are relying on this payment service.

iDEAL, the Dutch counterpart of PayPal, on the other hand, is organized according to the network model. Dutch banks give each other access to their customers' accounts and do not compete on reach but on distinctive propositions.

An interesting question is how those two payment platforms manage to generate trust with their approach. Both cases use the cumulative trust that the associated banks represent during payments. With the T.R.U.S.T. agreements, trust between the different banks is guaranteed, and in addition, each individual bank organizes trust for its own customers. They do this, inter alia, by issuing authentication tools for online banking, with which the authenticity of the actor is assured. There are various solutions; some banks use card readers with bank cards, others a calculator, or SMS codes. Because banks trust each other within the T.R.U.S.T. Framework, different solutions can exist next to each other and communicate with each other within the network. In the case of iDEAL, data and risk are decentralized and managed by each individual bank. Payments are not processed via a central point, but by the banks on a peer-to-peer basis. A "Napster for payments," so to speak.

In the case of the hub model, trust is organized at the center of the data triangle, while in the network model, it is decentralized and organized by the participating platforms.

The hub model used by PayPal is different. The middleman has access to the entire data triangle because PayPal has a relationship with both the seller and the buyer. All data are located at PayPal, for both sides of the market. This allows PayPal to manage the risks well and to customize trust. Data play an essential role in this because PayPal operates on the basis of the "access to the bank account" principle. This implies a risk for PayPal because, although customers provide their IBAN or credit card number, in certain cases, the transactions can be reversed. To evaluate that risk, PayPal increasingly uses other data points, like device numbers and geolocation, and there is an extensive department for fraud detection and prevention. Users can organize their accounts in such a way that no authentication is needed when they connect their devices, in which case it will be done automatically, on the basis of the data generated by the user itself. There is also a kind of data exchange: maximum ease-of-use in exchange for user data, so "data for data."

Over the years, the payment market has become quite complex. With the Internet and mobile technologies, a variety of new parties have started operating around the payment stack. They can be platforms, but also organizations focusing on only one side of the market, specifically the merchants. They are forced to keep integrating new payment methods in their websites, presenting opportunities for newcomers to address the resulting complexity. These combine various payment methods and sell them to merchants as a bundle, allowing them to integrate all the relevant payment methods in their sales process. In essence, those PSPs adopt a linear business model, providing a technical platform. Examples are Adyen, Ingenico, and Digital River[29].

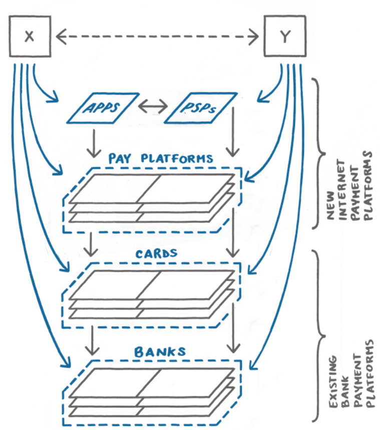


Figure 47. The current payment platform stack: platform on top of platform, on top of platform, on…

Figure 47 clearly shows that, on top of the basic banking infrastructure, a whole stacked digital world has been created, with a wide variety of middlemen. Also, the difference is visible between the PSPs that only service merchants, and the payment platforms servicing both sides of the market. Within this ecosystem, a payment functions on multiple levels because a payment can be seen as a set of interactions during which trust is transferred. At all these levels, different solutions are possible. At Facebook, for instance, sellers receive an instant confirmation that a payment has been made via the platform, but the money itself is transferred later. Payments can also take place lower in the ecosystem, at the level of an online payment method, the card, or the bank. In all cases, trust is created via a payment confirmation, while at the same time setting in motion all kinds of financial and technical mechanisms to organize that trust. Anyway, it is clear that the world of payments has become complex: buyers and sellers have more and more options, and some find it hard to see the wood for the trees.

CASE

PayPal versus iDEAL

The online payment platforms PayPal and iDEAL are both transversal payment platforms. While PayPal has adopted a hub model, however, iDEAL is a collaboration of the major Dutch banks in a network model. How did they both manage to reach their leading positions?

PayPal's clever tricks

The digital payment system PayPal had existed for a few years, and it had received about 100 million US Dollar in investment before it became successful. In the media, many of the critics had by then given up, but the company eventually hit back hard. PayPal solved the chicken-and-egg dilemma with a few clever tricks, at a time when social media had not yet really taken off.

The first trick was using the existing e-mail addresses of potential customers as "account numbers" within which PayPal initially deposited five dollars. Consumers could get access to that money, provided they confirmed their e-mail address and registered using an authorized credit card. That created a peer-to-peer payment system, in which people could use their PayPal accounts to transfer money to one another directly. It took an investment of tens of millions, but it proved effective, creating a viral effect on the consumer side of the market, with growth figures between 7% and 10% per day. Although the monetary incentives were gradually phased out, the company was able to build a base of over 100 million account holders[30].

The second factor was a large-scale collaboration with eBay, which promoted PayPal as a payment method, allowing the company to reinforce its position further. Until that time, it was not easy for people in the US to transfer money to each other. They used checks for transferring money, which was a major problem for eBay since it basically had no payment system to support its auction operations. PayPal introduced its new payment method with which person-to-person transactions via credit cards were facilitated. This was the tipping point.

The third factor was a clever way of hooking up to the credit card infrastructure. PayPal offered webshops the option of letting their customers pay with credit cards, compensating for the lack of reach of the shops toward buyers, or better "payers." That was a first step because when a buyer then paid with their credit card, they immediately received a suggestion to open a PayPal account, so that next time, they only needed their PayPal password to make a payment. This further increased PayPal's reach.

How the network model works for iDEAL

Although the Dutch market for card payments and transfers had long been organized according to the network model, at the end of the 1990s, Dutch banks were all busy setting up their own hub models for Internet payments. ABN AMRO with e-Wallet, Rabobank with Direct Betalen, and ING with Way2Pay. This led to fragmentation because both buyers and sellers were forced to multi-home with all three providers if they wanted to be able to buy or sell the entire product range online. In addition, payments had one of the most elaborate onboarding processes, which meant that adoption was slow. Everyone was waiting until it was clear what the market standard would be.

After a number of years of hard work with little to show for it as far as the three providers were concerned, they started being more open to a collaboration. They started to understand that it made more sense to compete on services than on reach. Enter the network model, in the form of the iDEAL project that got underway in 2004. The aim was to create a T.R.U.S.T. Framework. At the end of 2005, iDEAL went live, which was an absolute world record in terms of interbank collaboration. The new system's adoption was also very quick, especially because the side of the market that had the higher number of actors, the buyers, did not have to do anything for the onboarding. For them, the online payment system was just switched on one day as part of their online banking, after accepting a few additional terms. So, growth was above all driven by adoption on the side of the merchants, for whom iDEAL was an attractive proposition. This was not only because of its huge reach but also due to the low transaction costs. Up until that point, online payment providers usually charged a percentage of the purchase amount, analogous to the model used by credit cards and PayPal. As a result, online shopping was especially attractive for small purchases, while large transactions, like travel, electronics, and clothes, were lagging. iDEAL changed all that, and it was one of the main factors that made e-commerce in the Netherlands take off in the spectacular way that it did.

4.7 Identity Platforms

Digital user profiles are a relatively new phenomenon. They have only been around since all kinds of new platforms have begun to facilitate interactions and transactions via the Internet. In this section, we take a look at so-called *identity platforms*, platforms that turn digital (user) profiles—as defined earlier in this chapter—into their platform proposition. What role do they play in the organization of transactional trust? What is their function? What does this market look like and how is the reuse of profile data organized?

The Transversality of Identity Platforms

More and more platforms are designed to facilitate reliable transactions, as we saw earlier. That requires a clear picture of the other party in the transaction. On the Dutch site Marktplaats.nl or the Belgian site 2dehands.be, buyers want to know that a certain seller isn't a fraud, while the seller wants to be sure they will be paid. A platform like Airbnb takes this a step further. Hosts want to be sure that potential guests will behave diligently in their homes, and guests want to be certain they are getting the accommodation as advertised. Reputation data—for instance, in the form of ratings and reviews—can play a crucial role in those cases. For a peer-to-peer loan platform like Lendico, which facilitates users who want to borrow money from each other, there is an explicit obligation to organize trust, and determining the correct identity of the users and maintaining their reputation is a legal requirement.

All cases involve assuring transactional trust, which can only exist when all parties are certain that the other parties are who they say they are. Within the legal domain, the conditions for generating trust are organized in a different way. In the physical world, it is relatively easy to establish someone's identity. Trust can be created through personal contact, whether in combination with paper identification like a passport or driver's license, or a PIN number. It is all pretty straightforward.

> **The digital identity of an actor is an extension of its physical identity and consists of a collection of contextual data.**

Things are different in the digital domain, where there are other dynamics at play. During the initial development of the Internet, there was no possibility to interact. It was a uni-directional information channel. Little or nothing was known about the people visiting the websites. That was not a major problem; the web could function very well as a gigantic digital library, and trust played a limited role. That gradually changed in the interactive phase of the Internet, in which a number of social media platforms managed to reach tremendous scale. Through the use of social media platforms, physical people automatically build profiles, and at the same time, their identities expand into the digital domain, creating digital identities.

How could you define the *digital identity* of an actor? The short version is that it is the digital extension of its physical identity. This consists of a collection of contextual data that can, in principle, be limitless, and include work, education, and hobbies, or holiday preference, or the possession of certain products. The reliability of such platforms depends above all on the scale and connections. The more friends, content, likes, and other data a user has, the more reliable the user profile will be. In that respect, other reputation data are also important. The number of reviews by other actors about a user will have a positive effect on its profile.

Relational trust can be created that way, allowing actors to interact with each other and be reasonably sure about each other's identities. There is still a risk of a profile being fake, meaning that the digital identity and the physical identity of an actor are not the same. This means that to create transactional trust within the digital domain, more assurance is needed about the authenticity of the profile (identity) of the actors.

That creates a new set of needs and a business opportunity. Over time, we have seen the development of a wide range of parties wanting to act as middlemen in the digital trust market. They all have their own approach, ranging from the Dutch government's DigiD, the Facebook and Twitter login services, the German banks' Yes, and the Swedish and Norwegian bank's BankID. What this means for the users, as we indicated before, is a highly fragmented market and a multitude of user IDs and passwords. We saw a similar sort of fragmentation in the market for payment platforms. New middlemen focusing specifically on establishing and validating the identity of users add to that fragmentation big time.

> **With their millions of online and mutually connected profiles, large-scale social media platforms provide relational trust.**

A unique characteristic of digital trust is that it is based on data that can be reused transversally. That means that, in theory, digital identities are very scalable. In practice, however, we see the opposite. Due to the different solutions offered by individual platforms, the market is very fragmented, as we indicated earlier. An important development against that fragmentation is the growing possibility of using, for instance, a Facebook account to access other platforms, removing the need for login credentials for every single platform. As such, Facebook is more and more becoming an identity platform (according to the hub model), one that is able to determine the identity of its billions of users with a reasonable level of assurance. At the same time, up until today, Facebook is, above all, a social media platform using a relatively light onboarding process.

For platforms facilitating transactions, a more serious registration procedure is required, which means that, in addition to Facebook profile data, there will be extra checks. Furthermore, any identity platform will itself have to have a spotless reputation if it wants to provide that service to users. Commotion in 2016 about how Facebook shared the data of millions of users with a company called Cambridge Analytica, which then used that data for the campaign of US presidential candidate Trump, is not helpful in that respect[31]. That also goes for the recent revelation that third parties who are *embedded* in the platform had access to personal data with which users could be recognized and tracked on other websites and devices[32]. In 2019, Shosanna Zuboff coined the term “surveillance capitalism” in her book[33], giving a category name to “free” services where the users are the product.

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The Functions of an Identity Platform

How do identity platforms operate? As we saw, a digital identity is an extension of the identity of a person or organization in the physical world and consists of collections of contextual data. A platform recording these data, and making them accessible, has to deal with two types of interested parties: the user, whose extended identity is involved; and the so-called *relying party*, the party trusting that the information is correct. The relying party, with whom the user is interacting, can be a business, the government, or another person. In that respect, the use of a digital identity is not so different from a payment: there is a similar relationship between the actors involved, with the relying party playing the same role as the seller accepting a payment. What is the need that is served by such a digital identity? We distinguish three functions: *identification*, *authentication,* and *authorization*. Identification involves the delivery of personal attributes such as name, age, social security number (for identification with the national IRS and other government agencies), or preferences so that the relying party is able to establish the user's identity. Authentication involves proof that "you are who you say you are" and confirms the actor's identity. Often, the relying party provides a personal password or code (for example, via SMS or e-mail) that they can use to log in. In some cases, this is combined with a question that only the user involved can answer and which provides additional proof that the user is the person they claim to be.

Authorization, finally, has to do with the rights that have been assigned to a user. What can it do at the relying party—for instance, its bank? Can it make a payment, or is it only authorized to see certain information? An actor can acquire those rights for itself or for another person or identity. In all cases, authorization is linked to a digital identity.

In this context, the concept of *progressive disclosure* is interesting. This is the gradual onboarding during which an actor provides more information about itself as the buying process unfolds. At each touch point, additional information is submitted to allow the next step in the process to take place. When applying for a mortgage, for example, it is not necessary for the applicant to provide confidential information during the discovery step that may reveal its physical identity, such as its name and address. This approach may lower the onboarding threshold, making it possible to offer customized solutions that may lead to a transaction. It also has considerable advantages when it comes to privacy: the buyer faces less risk because he or she has to provide less personal data.

The Web3 movement embodies the change of paradigm, where users are in control of their data. In the world of crypto-transactions, this means users have the option to go "direct," so, not using a middleman as service provider. Users do not "log in" anymore, instead they "connect" to the service and allow the service to access the necessary data to perform a transaction. A typical set-up in 2022 could involve a service like Uniswap (decentralized exchange), which is accessed by Metamask, a user-controlled software wallet. Alternatively, users who do not want to bother with managing cryptographic keys and the associated risks could use a service like Blockfi or Celsius. There they open an account and these companies deliver the services to the user. Very similar to traditional financial services.

For identity, this paradigm has been translated into the concept of Self Sovereign Identity (SSI)[34]. There, data about users is represented by cryptographic tokens (e.g., name, date of birth, address, professional qualifications, etc.) and held in a wallet. The tokens can be "self-declared" by the user or provided by an issuer, e.g., a government or university. Upon the request of a relying party, the user can present the token (information) directly to the relying party. If the tokens are coming from an issuer, the relying party has the option to verify with the issuer the authenticity of the token.

In 2021, the EU regulation on digital identity advanced further with the introduction of eIDAS2, which includes the introduction of the European Digital Identity Wallet by 2024 at the earliest[35]. It has many of the SSI aspects included, such as the use of tokens, which are issued by governments. Ultimately, such wallets could ultimately replace physical identity documents, although this will take a few decades. Just as cheques are still around in a world of digital payments.

Marketing Strategies: Clear Analogy With "Payments"

At the moment, the markets for payments and digital identity are very much intertwined. In this section, we start by looking at four approaches that parties can apply in both markets. We then draw parallels in the way these organizations organize their intermediary functions to realize transactional trust. Finally, we address the scenario in which payments and digital identities are further separated. In this case, a well-functioning, central trust infrastructure could become a reality, making it easier to make payments.

Similar to what is happening in the digital payments landscape, all kinds of new providers of identity services are starting to build platforms. On one side of their market, they compete for users, and on the other side for the relying parties. This is comparable to the way payment platforms try to bind both buyers and sellers, to then bring them together.

In both markets, middlemen can operate according to four basic approaches. In addition to the hub or network model, they can also choose the direct model or the aggregator model. We will discuss all four options. When an identity platform adopts the *direct* model, that means that the relying parties themselves issue their passwords and login data directly to the users, using their own procedures. Parties like Google, Twitter, and Facebook are well-known examples. We see a similar development in the payment market, where companies like Amazon and Alibaba each introduce their own payment services.

> Parties that are active in the markets for payments or digital identities can use four market approaches: the direct model, the hub model, the network model, or the aggregator model.

In the digital identities market, a hub model is used when relying parties with lots of users open up their system to other providers.

Earlier, we mentioned the Facebook account, which can be used to log in to other platforms that are used daily, such as Airbnb, Twitter, and TikTok. This increases Big Tech's reach and strengthens their market dominance.

In a network model, parties work together to create a certain form of transversality or reusability. In the case of digital identities, one relying party accepts users from the other, and vice versa. This approach, on the one hand, limits fragmentation, while on the other hand, promotes competition, which stimulates innovation. In many European countries, there are initiatives for identity networks, as there are in the US. In Europe, the eIDAS regulation applies, the purpose of which is to make local solutions for digital identities usable in all EU member states. Examples of the network model within the market for digital identities are the Dutch eHerkenning and iDIN, and the Swedish and Norwegian BankID and German Yes. When we compare this approach to the payment market, the Dutch iDEAL, and MasterCard and Visa are organized in a similar way. The fourth approach is the aggregator model. Parties operating in the market for digital identities according to the aggregator model are also known as Digital Identity Service Providers (DISPs), and they are becoming increasingly influential. Like their counterparts in the payment world, they aggregate and facilitate existing solutions of identity platforms. This happens in the same way that the processing of a provider's transaction at the back end takes place via a service provider *gateway*. This way, providers are able to reach users who are connected to different identity platforms. Parties like Signicat and eIntegrity operate in this market. Their counterparts on the payment market include WorldPay and Adyen. Table 12 provides an overview of all the models in both markets, side by side.

Table 12: Four market models for digital identity and their counterparts on the payment market

	Identity solution	**Payment counterpart**
Direct model	Companies issuing their own login details (username, password). - Google - Facebook - Twitter - Webstores - Banks	Companies creating, issuing their own payment methods. - StarbucksCard - Amazon Pay - Alipay - WeChat Pay - Apple Pay
Platform hub model	Platforms that offer their login details to others. - Facebook - LinkedIn - Twitter - DigiD - FIANET - Aadhaar	Banks offering their payment methods to others. - American Express - PayPal - Belfius
Platform network model	Identity issuers working together in a network to provide an identity solution. - BankID, NemID - eHerkenning - iDIN - NIST	Banks working together in a network for a payment method. - MasterCard, Visa - iDEAL - GiroPay - MyBank - Zapp
Aggregator / Gateway	DISPs provide access to multiple identity platforms (hub and/or network) via a single interface. - Signicat - Acuant - Aristotle	PSPs provide access to multiple payment platforms (hub and/or network) via a single interface. Can include both data and money flows (collecting) or only data flows (distributing). - Adyen - Wirecard - Worldpay

As we can see, there are many similarities between the markets for digital identities and payments. Both are intermediary functions that service two sides of the market, and there are similar mechanisms involved. As with any platform, the first thing that matters is scale; creating sufficient reach on both sides of the market. Usually, middlemen try to do so by offering asymmetrical propositions to their users. When the middleman has implemented a proposition for both parties, which offers them the best solutions, the conditions have been created for successful transactions.

After that, in both payment and identity platforms, what is important is conversion. Will both sides of the market actually use the platform to do business with each other? Both the user and the seller or relying party can choose a solution that is the most reliable, the most user-friendly, and the least expensive. Finally, for both types of platforms, the fees being charged must be proportional to what the two target groups want to achieve with the exchange. When the costs are too high in their view, this will have a negative impact on the conversion. In addition to the similar dynamics, there is also a partial overlap between the markets for digital identities and payments. As we saw earlier, trust is also at the heart of every payment platform.

Security also plays an important role. For users, it is relatively easy to make a payment. A few decades ago, things were quite different. People had to bring personal identification to a local bank to make a payment. Electronic systems increased user-friendliness, but also created new types of crime. Service providers had to protect themselves and their clients using increasingly sophisticated technologies and procedures. One of the functions of digital identities is to organize security, involving all the measures designed to prevent the unauthorized use of a system. That is an important reason why payment platforms use digital identities on a large scale. It is to protect their platform, and, as such, to ensure trust.

In the payment world, identification is subject to all kinds of legal requirements, which means that it is thoroughly organized. That has led to billions of transaction accounts worldwide, which have been verified with strong authentication. The account holders have been subjected to a number of checks before they were even allowed to open a bank account. Security and risk management are crucially important in that regard. On the other hand, an opposite trend is visible. Online sellers are wary of any adverse effect that authentication may have on their conversion, making them use a lighter version during *check-out*. So, they decide in favor of user-friendliness for their customers, which in this case affects security.

> **In India, over 900 million people have been handed a physical card as a digital identification.**

In addition to banks making a lot of effort to create a secure identification, governments all over the world are also active in this area. An example is an initiative from India, Aadhaar, where more than 900 million people were handed a physical card as a digital identification to access government services, with the aim of improving efficiency and limiting abuse[36].

In 2014, the Nigerian government also launched a large-scale *e-identity* program, in which digital identification, in the form of a card, is combined with a prepaid payment functionality in collaboration with MasterCard. The effect is that citizens become increasingly familiar with procedures surrounding digital identification. The physical "smart cards" issued by governments and banks can also support the necessary authentication for other services and accounts, making them easier to access. In Scandinavia, digital identification has been around for more than twenty years. In Sweden and Norway, identities play an important role with banks (BankID), where they are used to login at governments and commercial parties. In Denmark, banks and governments are working together to create their own identity platform, NemID (hub model), with joint governance.

4.8 The "Unbundling" of Identity and Payment

Since the first payment took place, payments and identities have been intertwined, which makes sense, because you want to be sure that you are dealing with the right person when you are making a payment. That is something we are still dealing with on a daily basis; think of all the PIN numbers, login procedures, and signatures that are required to be able to make a payment. Authentication is a core activity within every payment. The result is that the markets for digital payments and digital identities are very closely related, and there is even a degree of overlap. The question is whether it wouldn't be better to organize these two functions separately. That could help create a well-functioning, central trust infrastructure in which payments could be made more easily.

What would it mean if the payment and digital identity functions were to be separated? In such a new situation, a payment provider would become the relying party of an identity platform. This means that the payment provider would be a user of the trust platform in order to secure the necessary authentication to be able to execute a payment transaction, rather than doing it itself. What are the benefits of that? From the point of view of the seller, the existing link between payment and identity is far from ideal. All the necessary identification procedures designed to limit its risks are at odds with its conversion targets. Ideally, it wouldn't need any authentication at all because it appears to be one of the most important reasons why buyers decide not to proceed with a potential purchase.

Smartphones worsen the problem because the necessary authentication procedures are even harder to perform on a small screen, resulting in more missed sales. At the same time, the smartphone in question could lead to a solution because of the interesting options it provides for innovative, frictionless authentication.

Web3 wallet, which "connects" to services (instead of login in), already pioneers this. In fact, a wallet can be seen as a portable account that users carry around. The FIDO Alliance, which includes several large IT firms, is an important player in this respect. They seek to replace the use of passwords with new technologies, like the use of fingerprint scanning on mobile devices[37].

> Smartphones offer opportunities for decoupling the authentication from the transaction, enabling one-click buying.

Thanks to ever-advancing technology, combined with very personal use, smartphones offer opportunities for separating the authentication from the payment, making so-called "one-click buying" a possibility. That means, once the user has registered with their smartphone, they can then make subsequent payments more easily, and a complete authorization process is no longer necessary. App stores like iTunes also use this approach. Users start by creating an account in which their payment method is verified. After this, all payments can be carried out with only a password, fingerprint, or face recognition. Because of their personal nature, smartphones are an effective tool for limiting transaction risks. For instance, during a transaction, users can be recognized with their phone IDs, which also makes it possible to detect fraud early on in the transaction. What is also important is that every user logs on to its device every day. Many merchants consider Internet traffic via smartphones to be more secure than via desktop PCs.

So, there are two approaches to limiting payment risks. Policymakers—who recognize the importance of secure payments via computers or mobile phones—are primarily looking at *strong customer authentication (SCA)* as a solution. Merchants, however, prefer a so-called *risk-based approach*, limiting risks on the basis of existing user data, without creating additional thresholds for users. The European Banking Authority (EBA) published a guideline about this subject, which has been in force since August 2015[38].

Data Sharing as a New Phenomenon

In recent years, awareness about the importance of data has seriously increased, and not just in relation to privacy. People also question the often opaque way the data-driven advertising market works and the fact that data can upend entire sectors, like the taxi sector.

As far as privacy is concerned, we like to refer to the work of two research journalists of the online platform The Correspondent, who were able to map the problems clearly. One of their conclusions was that the subject of data would keep resurfacing in decades to come[39]. As we mentioned earlier, the European GDPR privacy legislation represents a significant development. But we are not there yet.

The issue is broader. In this age of digitization, we need a new vision of the role of the individual, a subject that has been on the agenda of various opinion leaders involved in digitization since the start of this millennium. Their ideas can be summarized with terms like *Vendor Relationship Management*, *Data Sovereignty,* or *Self-sovereign Identity*. They are inspired by the idea of "reversal," which means that, in the digital world, individuals are represented by attributes about themselves. Data. That notion has enormous potential but for the fact that these data are scattered across an increasing number of different platforms. As a result, the individual in question has little grip or control on it. In the vision of these visionaries, the individual needs to gain control over their data, enabling them to safeguard their own privacy. They can manage the sharing of their data, and potentially unlock financial benefit from their data transactions.

> **With data sharing, consumers actively give their consent to share their personal data.**

When we talk about data sharing, a distinction can be drawn between generic platforms, like Digi.me and People.io, and more specific platforms. LastPass and Dashlane, for instance, focus on passwords, while parties like Strava and Endomondo specialize in sports data. We call this entire category of platforms *data-control platforms*. In fact, they are identity platforms that are further developed by adding more user attributes. While identity platforms often limit themselves to basic sets of user data (often names and addresses), data-control platforms go beyond that by adding both usage and reputation data. That means that this category has a large degree of variation, and, in theory, the number of specialized platforms is infinite.

> **Data-control platforms are identity platforms that are further developed by adding more user and usage data to the profiles.**

At the same time, we see an increasing demand for data sharing through the continued digitization of processes. It is expected that the current fragmentation will be an obstacle to the large-scale adoption by users on both sides of the market. That is why there have been initiatives in various places for network models, creating a bigger reach for sharing personal data. Examples are Mydata.org and the Sovrin Foundation. For sharing medical data, the Dutch trust scheme MedMij was founded in 2018. This initiative was also organized according to the T.R.U.S.T. Framework in a network model. This allowed patients to give their consent (via their digital identity) for data to be shared between medical service providers, and compose an integrated overview of their own medical data at the same time.

Thanks to the advancing developments in technology, there are also other ways to give users back control of their data. For instance, it is possible for personal data and their user rights—the consent—to be located in different places.

> An alternative form of data sharing is a digital wallet with which users control the access rights to their personal data.

Such a Web3 wallet creates a situation that is comparable to the "locker" people use in the physical world, where a key gives access to a home, car, bicycle, or office. A key defines specific access rights that are transferrable. In the digital world, the same approach can be used for personal data. The data owner is provided with a wallet with which to manage the access rights to its personal data. For instance, there can be a key that gives its doctor access to its medical file, another key that gives the bank access to its income data, and a key providing its insurance company access to its energy meter. The data can be all in one place (so in the wallet itself), but also a decentralized approach is possible: data at the source. Web3 pioneers this already in the financial realm, the SSI development extends this to all sorts of data.

The political and societal direction, certainly in Europe, is toward consumers regaining control over their personal data. This has an important impact on all the players in the market and on the way platforms will function in the future. It is that increase in control over personal data that is the foundation for the next phase of the Internet: the transactional Internet.

More about this in the final chapter.

4.9 Summary

In this chapter, we have superimposed the phenomena of transactions and platforms. Data plays a key role in this, as we have seen.

- Although two actors experience direct interaction within transactions, they actually interact separately with the middleman. The middleman, with its platform, is not an actor in the transaction itself, but it is an actor in the sense that it facilitates all the digital interactions that make the transaction possible. In that regard, the middleman has two different positions in the digital domain.
- At a data level, there is a linear chain. The two actors exchange their data, with the middleman as a serving hatch, creating a data triangle with the platform. As a result, the platform records all the data.

- All *transaction data* are located in the *data triangle*. First of all, the input data consisting of the user data and derived reputation data. These *input data* make the transaction possible. They are complemented with the usage data about all the exchanges that took place via the platform over time: the *output data.*
- The *digital identity* or *user profile* of an actor is an extension of its physical identity and consists of a collection of contextual data. A user profile consists of *entity data* (user data), *behavior data* (usage data), and *reputation data* (behavior data interpreted by third parties). Thanks to digitization, the volume of this type of data has exploded.
- Platforms not only use the *transaction data* to facilitate interactions between the two actors, but they also have smart ways of monetizing these data in other markets, resulting in huge profits. This evokes increasing social resistance as users are finding out that they are "the product" and their privacy is at stake. The *data benefit balance* has to be restored in favor of individuals.
- At the moment, *transactional trust* is organized mainly by middlemen and their platforms, through institutional trust. Three dimensions can be distinguished: *relational trust*, *product trust,* and *process trust.*
- Risk and trust are two sides of the same coin. Converting risk into trust takes money and effort; the transaction costs. The greater the initial distrust or risk, the higher the transaction costs. During the buying process, *risk acceptance* is lowest during the transaction step, which consists of agreement, payment, and delivery. When all parties can organize that step more efficiently, it enables a considerable reduction of transactions costs.
- Within the digital domain, *trust* takes on the form of *data*. Trust can be deployed transversally, and it can be used an infinite number of times. That means that trust is a two-sided

market, with two interested parties: the user and the *relying party*.

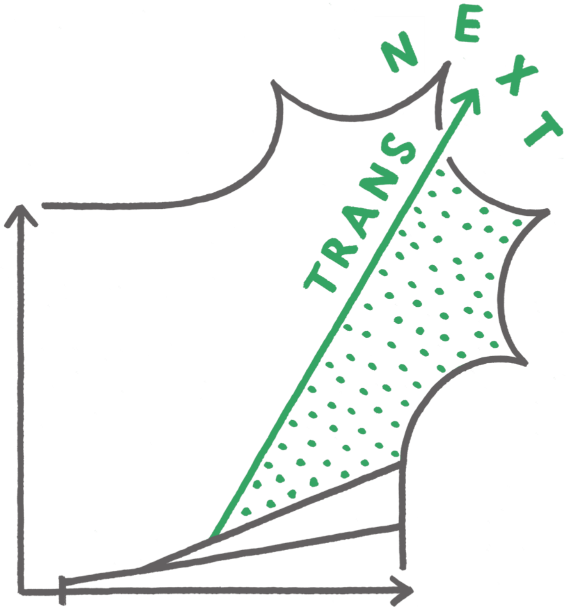
- There are two significant types of platforms in the trust market: *payment platforms* and *identity platforms*. Both of them focus on the transversal reuse of data to facilitate transactions with trust on multiple platforms.
- Both types of platforms are organized on the basis of the T.R.U.S.T. dimensions to provide transactional trust, either in a hub model (centralized) or in a network model (decentralized).
- In addition to the quality, it is also the scale that, to a large extent, determines the value of trust. Nevertheless, many platforms apply their own trust mechanisms, which limit growth and ultimately provide a less-than-optimal service to the end users in a fragmented market.
- Ideally, consumers must register only once, after which they have access to all other platforms. In that scenario, all transactions will be possible at *low transaction costs* and without unnecessary friction.
- Digitization also leads to new forms of money. User profiles represent a new value, which can be cashed out not once, but an infinite number of times. To create a data benefit balance, consumers need to become more aware and in control, while platforms need to become more transparent, and new ways are needed to value data.
- Traditionally, “payment” and “identity” have always been coupled, but they can now be *decoupled* into separate platform propositions.
- *Data-control platforms* operate in the new market of data sharing and are a next step in the evolution of identity platforms. They do so by adding more transaction data to the profiles. They respond to the GDPR regulation, which gives users control over their data and provides them with the need for a corresponding infrastructure.
- An alternative approach to data sharing is to store personal data and the access rights to it in separate locations; typically,

at the source. This creates a *digital locker* (i.e. wallet) with which users manage the access rights to their personal data. The data remain in the same location.

- *Digital self-determination*, *data sovereignty*, and a restored *data benefit balance* make up the trust foundation of the transactional Internet.

Chapter Five

THE SHIFT TO INFRASTRUCTURAL TRUST


TRANS
NEXT

5.1 Introduction

> **The transactional phase of the Internet requires a shift from institutional toward infrastructural trust.**

"The transactional Internet is about to happen" has been the resounding message from the first page of this book. Slowly, but surely, the web is becoming more and more suitable for transactions. Middlemen, facilitating exchanges between two or more user groups, flourish in the digital domain. With their platforms, they develop environments in which products and services can be exchanged efficiently and reliably in all kinds of markets. The role of the middleman is much greater than we are used to in the physical world. For starters, longitudinal platforms shorten the linear value chain, claiming a bigger share of the profit margins. And, more importantly, while it is relatively easy to create trust—the condition for any transaction—between actors in a physical context, things are different in the digital domain. There, digital platforms provide trust by using data to remove all the risks for the actors in their market one by one. From a macroeconomic perspective, however, the transaction step has not yet been organized in the most cost-efficient way. At the moment, eliminating the risks to generate trust between the actors is a costly affair for middlemen. The high transaction costs make transactions unnecessarily expensive, even though the trust that is being built can be reused transversally.

Not only is this a missed opportunity for economic growth, but it is also an urgent problem. The number of worldwide transactions is about to explode, in a world that is not yet ready for it. Many companies are unaware of the explosion in the number of transactions that awaits us. They do expect growth but underestimate the speed with which this takes place. They have taken measures, but these are not enough to remove the risks, simply because the problems cannot be solved at the level of one organization.

We will have to make a shift from institutional trust toward infrastructural trust, in which trust is embedded in the Internet. To allow this transactional Internet to function, two *big fixes* are needed, which we will discuss in this chapter: breaking the trust paradox and restoring the data benefit balance. Finally, we provide guidelines for all stakeholders involved, to be able actually to make the changes that have to be made. Then the promise of a transactional Internet can become a reality and allow all actors—individuals, organizations, and things—to do business with each other effortlessly, on a scale that is unimaginable in the physical world.

5.2 Explosive Increase in Digital Transactions

In the period ahead, the number of digital transactions will continue to grow spectacularly: from 365 trillion in 2018 to 5,500 trillion in 2025. The end of this growth is not in sight. That means that the number of transactions will grow fifteen-fold in seven years[1]. Where will that growth come from? Those who are already digitally active will not suddenly start buying more. Although we do expect that the multi-content of the shopping cart will be broken up into separate purchases, that will not cause the increase. Nor will the transfer of transactions from other infrastructures—electronic or otherwise—to the Internet, such as the use of digital money instead of cash, generate the additional transactions we are referring to. The growth we expect comes from three sources: new Internet users becoming economically active in the digital domain, the *sharing economy,* and the Internet of Things. This development will be accelerated by the new category of transactions, the data transactions. We take a brief look at these four factors.

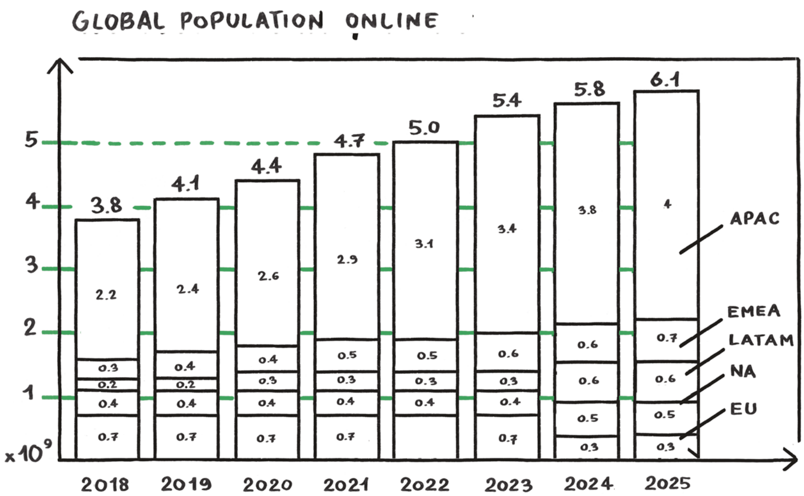


Figure 48. Growth in the number of Internet users.

If we look at the number of new Internet users, we see the following picture. The number of people with Internet access worldwide is expected to grow from 3.8 billion in 2018 to 5.4 billion in 2023. The bulk of that growth will come from Asia, the Middle East, and Africa[2]. Due to the large size of the population in those areas, the digital transformation will be accompanied by impressive numbers. In Europe and North America, online penetration is already around 80%, and we are seeing a very limited increase. The average annual growth in the number of users between 2018 and 2025 is estimated at 7%.

The second factor in the number of digital transactions is the "sharing economy." In 2018, the number of transactions in this category was only 9 trillion, but it is expected to reach 174 trillion around 2025. This evolution is caused by the possibility the Internet offers to share, trade, or rent products. That can lead to follow-up transactions after a purchase, making it possible to monetize the untapped value. As we will see in the next section, the transactional Internet will further accelerate this growth. This creates the ideal circumstances to conduct genuine peer-to-peer transactions at low cost, with limited intervention of expensive platforms, making transactions with a lower exchange value also attractive.

The Internet of Things is the most important boost to the number of digital transactions. More and more physical products and devices, such as cars, microwaves, and complete industrial production lines will be connected to the Internet. That will bring a whole new group of actors online, in record numbers. The subcategories of the industrial Internet and the *smart* or *connected cities* will be responsible for the bulk of that increase.

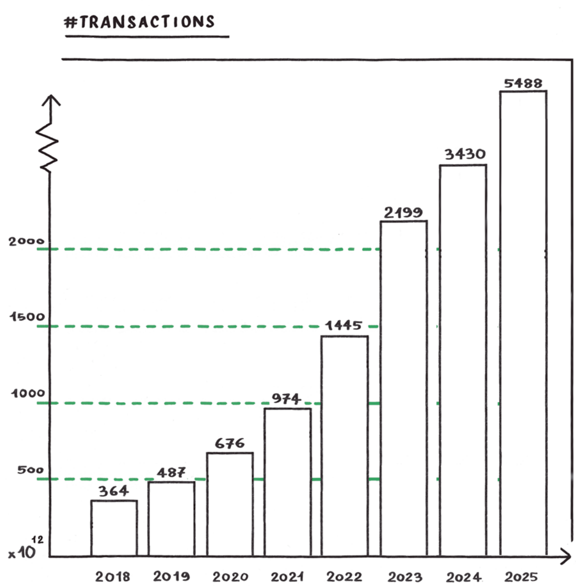


Figure 49. Growth of the number of transactions

In addition, the ongoing digitization of the trade process will seriously accelerate the growth of the number of transactions. This is caused by the new category of data transactions, located below the level of the trade transactions, and which underpins the transaction process. Think about how many data transactions are needed before an actor has booked and paid for a trip. These "data-for-data" transactions are a result of the increasing digitization of customer journeys. Although we have not included this effect in the predicted growth in transactions, it acts as a serious multiplier. Covid lockdowns and the subsequent acceleration of online shopping underline this point.

The Sharing Economy and Symmetry Go Hand in Hand

It is becoming more and more common to share our possessions with others. Via Peerby, you can lend your chocolate fountain to a neighbor. You can share your second car—which is just sitting idle most of the time—via SnappCar, and, when you are on holiday, you can rent out your home on Airbnb. The current *sharing economy* indicates that the actors involved have become more equal in their interactions and transactions; they are acting in a peer-to-peer way; in other words, with more symmetrical transaction needs. The distinction between person-to-person (P2P) or consumer-to-consumer (C2C), business-to-consumer (B2C), or business-to-business (B2B) becomes irrelevant because all actors want, and get the same opportunities; functionally, technically, and legally. Why should a company be able to accept card payments, but not a person? This will be evened out. We refer to this trend with the word *peerification*, which opens a whole new domain of economic activity, resulting in a serious increase in the number of trade transactions. Web3 transactions through wallets are peer-to-peer by nature. The data transactions that underpin these exchanges provide the multiplier for the growth of the number of digital transactions.

In the sharing economy, the residual capacity of things is exploited, optimizing the use of goods that are already available. The practical principle "I have something that I don't use all day, so someone else can benefit from it" has created a whole new economy. Digital platforms now make that possible for their users. After going through the onboarding process, people can lend or rent all kinds of things with just a few clicks. The *extended value chain*[3] does not stop at the sale of a product but continues after that. In effect, there are two economies that exist next to—or after—each other: the traditional *producer economy*, which is based on the production and sale of things, and a growing *user economy* that is based on the principle of sharing and optimizing the use of products that have already been sold.

> In the sharing economy, the residual capacity of things is exploited, optimizing the use of all available goods. "Sharing is caring": for our fellow humans and for the planet.

Within the sharing economy, various types of exchanges are possible: literally exchanging goods or services, lending without any compensation, and renting for money. We already mentioned Peerby, the platform that makes it possible to borrow things from people in your neighborhood. You can even share Wi-Fi via a platform like Fon. If you provide your Wi-Fi capacity to others, in turn, you get access to all the participating hotspots all over the world. And a platform like Behomm makes it possible for people with a similar mindset (in this case "creatives") to swap homes for vacations, without money changing hands. While in the past, the number of transactions per possession was limited, we now see that a traditional purchase can lead to all kinds of follow-up transactions. Owners have more options at their disposal to make money from their things. A platform like SnappCar, which facilitates the sharing of cars among private individuals, has to organize all kinds of things for both parties, including insurance, verifying the renter's driver's license, and checking the car for damage afterward. To limit the risks, a relatively heavy onboarding process is involved, both for the lender and for the renter. That means that the platform has an important added value in the exchange and is able to claim a considerable share of the transaction value. Vinted is a fast-growing platform for second-hand clothes and accessories, playing into peerification and sustainability.

> "Peerification" assumes symmetrical exchange between two equal actors who can exchange roles, who are able to find each other more directly, and who can easily establish each other's trustworthiness.

How would such a transaction work in the world of the transactional Internet, where the individual actors have organized their personal information, their profile, themselves in a decentralized way, like in a Web3 world? That would make the role of the platform in bringing the information together and organizing trust, largely redundant. The onboarding for both parties could be very light because the transactional Internet would provide the data itself out of the wallets controlled by users. As a result, the transaction costs would be drastically lower for both actors; after they have found each other for a transaction, they establish each other's trustworthiness, and engage in a transaction much more directly. Also, their propositions would be much more similar, more symmetrical.

In the transactional Internet, the division of roles between the actors is much more equal, and this has major consequences, especially for consumers. At a trading level, private individuals can act as vendors as naturally as businesses can. In addition, the interaction with the platform facilitating the exchange is much more balanced. The added value of such a platform is then specifically about making supply and demand transparent. After this, the two parties can do business with each other directly because an elaborate onboarding procedure via the platform is no longer necessary. Next, the actors can pay each other directly, as this too, is a function where the platform will have limited added value. All this implies that the middleman will have to find other ways of adding value with its platform, or its revenues will decrease considerably.

We have already determined that peerification is about interactions between similar actors. That implies that asymmetrical propositions will evolve into symmetrical propositions, as both actors are given the same tools with which they can play the alternating role of both buyer and seller. Symmetry and equality go hand in hand.

Switching from buying to selling, eventually, will be as easy as it currently is to call or be called via a telephone. The strict separation between consumer and business will become more and more diffuse as a result. This will make it easier to engage in all kinds of transactions; transactions that today are paid for in cash, but also new forms of transactions that we don't know about yet.

Incidentally, this evolution toward symmetrical propositions was also a gradual one in a market like mobile telecom, where, until the 1990s, both actors had their own tools for the exchange. The sender of a message used a pager, with which it could send short messages via radio frequencies. To decipher the messages, the recipient needed a special decoder. They could then use a landline to communicate about the content of the message. And while, these days, we use our smartphones and send each other text messages all the time, that used to be a much more elaborate affair. Over time, the role of the platforms facilitating mobile telecom changed a lot.

> The roles of customers and suppliers are becoming increasingly equal. This requires symmetrical propositions that enable actors to switch easily between roles.

What does it mean when we translate the concept of symmetrical propositions to the example involving the payment market? To be able to make direct payments, the tools of the two actors need to be modified. In the current situation, a private individual has a bank or credit card, and the merchant has a payment terminal at its disposal. It becomes complicated when two private individuals want to pay each other directly with a card, electronically, because they don't have the functionality of the payment terminal. It is only when card and terminal are replaced by a standardized tool that enables the two actors to play both roles—buyer and seller—that they can easily switch between making payments and accepting them. In China, thanks to WeChat Pay and Alipay, that model already largely exists. For physical cards, we see this happening now as well with the advent of NFC in nearly all phones and terminal apps, so all a merchant needs now is a contract to accept payment. Peerification is almost there.

BACKGROUND

Toward more symmetrical propositions for mail packages

Postal delivery is one of the first markets to have undergone a drastic transformation with the arrival of the Internet. These days, we hardly send any letters, and if something is distributed in the physical world, it's mostly packages. However, the tools that actors have at their disposal still, to a large extent, stem from the era of letters. On the one hand, the delivery side has drop-off mailboxes, while customers, on the other hand, have a letterbox at their front door or entrance. The proposition is asymmetrical, with both actors using tools designed to support their particular roles in the physical exchange. However, the recipient's tool no longer serves its purpose. Most packages don't fit into the tiny letterboxes. This side of the market has an urgent need for a quality service involving the delivery of goods that have been ordered online. As a proposition, the traditional letterbox is hardly in use anymore.

Postal recipients increasingly want to determine how, when, and at what costs they receive their packages. How can that be addressed? Businesses already have a so-called "Post Office Box, or PO Box." For a small monthly fee, they can pick up the mail at any time, or have it delivered with a service level. No such option exists for consumers. It would be possible to install lockers on a massive scale, where businesses can leave us the clothes and kitchen utensils we buy online, but that would take an enormous investment. And who should make such an investment? Parties like Bringme and MyPUP install physical "delivery walls" at businesses and public spaces, with an app to open the individual lockers. It seems to make more sense to connect to existing infrastructure for this side of the market. The Dutch supermarket chain Albert Heijn understood this and created thousands of pick-up points for online retailer Bol.com, without having to make much of an investment. Any business with a relationship with end users could, in principle, be such a pick-up point. It could be the local grocer or the office where people work during the day, or the kindergarten. These parties have an opportunity to increase their income with a variety of revenue models. In addition, recipients can indicate when they want their package delivered, giving them more choice in the price and quality of this service.

An interesting development is the relatively new segment of "social delivery," which focuses on the last mile of the delivery. All too often, packages are delivered when the recipient isn't home. A platform like Homerr builds on the notion that there is always someone in the neighborhood to take delivery of the package. ViaTim is a similar initiative, but it works with certain people who offer a location that serves as a hub, where people from the neighborhood can come pick up their packages. A fine-grained market will emerge in which various parties will cover a part of the delivery process and divide the costs and revenues proportionally. Track-and-trace systems show where packages are located, making it transparent whether the recipient will get what it paid for.

At the moment, there are already initiatives that facilitate direct peer-to-peer payments. In the Netherlands, ABN AMRO Bank offers Tikkie, an app that was developed as an extension to the iDEAL payment service, with which people can pay each other via links shared on WhatsApp. In many situations, people front money by paying for one or more other people. If you want that money back, you select the people in your WhatsApp contact list and send them a link with a payment request. Recipients only have to click on the link to proceed with a payment via iDEAL directly from their bank account. That way, anyone can become an iDEAL payee, a role that used to be limited to companies or organizations. So, we are already seeing that the functionality that makes it possible to collect money quickly is becoming more accessible to both sides of the market.

This trend toward symmetry is not limited to the payment market. In other markets as well, private individuals increasingly no longer play the role of consumer but of producer as well, and regularly switch roles in the domain in question. The energy market is a good example, with households increasingly generating energy; for instance, with solar panels. And they switch roles all the time; sometimes they have a shortage, and they need to buy extra energy as consumers, and other times, they have a surplus, and they can sell energy as producers. When households sell their surplus to the net, they also act as suppliers. While, at the moment, energy companies dominate this process by connecting suppliers and users in an asymmetrical way, it is possible that, in the near future, households will also be able to deliver to each other directly. They will have to be facilitated in their role of supplier; for instance, in finding a suitable trade partner for a certain period or determining the right price. That can easily be automated. Algorithms can be used to determine the day rate, based on factors like demand, supply, and weather conditions. A Dutch initiative addressing this need is a platform called Vandebron[4], which enables people to buy green energy directly from a selected supplier; it can be wind energy, hydro-energy, bio-energy, or solar energy. Although at the moment, there are no purely symmetrical propositions, developments continue apace. Consumers can select the type of energy and the producer whose energy they want to buy. In turn, that individual supplier is certain of its turnover and price. And supply and demand are brought together much more directly.

The Internet of Things as "the Next Big Thing"

The most important boost to the number of digital trade transactions is the Internet of Things. Because more and more physical products and devices are connected to the Internet, a whole new category of actors is coming online; from lamps to robots, and from coffee machines to cars. We are talking about huge numbers of "things" that, in theory, can conduct an unlimited number of transactions with other actors, like people and organizations, or even other "things." That is why the Internet was upgraded from Internet Protocol4 (IP4) to Internet Protocol6 (IP6). By now, there are more Internet (IP) addresses than there are atoms in the universe. But it takes more to allow the Internet of Things to function optimally. In this paragraph, we show where the bottlenecks are in the current interactive phase of the web and how they can be solved.

The Internet of Things can be seen as the technical infrastructure connecting physical objects—the "things"—to each other through embedded software and connectivity[5]. These smart objects can log information and exchange data with other connected devices or things. Each individual "thing" is recognizable because its technical environment is connected to the Internet environment. This creates a programmable world, in which everything is connected, and objects can also interact with each other. In that way, they can anticipate people's needs flawlessly.

A well-known example of the Internet of Things is Philips' Hue lighting. Thanks to the digital and connective nature of that LED lighting, it can be operated from anywhere via a link with a smartphone. How does that work exactly? The owner signs up to the Hue platform and creates an account to which its lamps are connected, allowing it to put the lights to the desired settings whenever it comes home—with smart "scenes." The intensity and color of the light, therefore, can be adjusted automatically to each situation. A bustling party, after all, requires a different lighting environment from a fifteen-minute meditation. The lighting interacts with the actor's environment, adapting itself seamlessly to the requirements at any given time[6].

Our lives would be even easier if a pizza box and microwave worked together; so, without our intervention, it would heat up the pizza in the right way. In that case, the two separate "things" work together effectively. That is much harder to organize because the things must be equipped with the same type of intelligence. In the current phase of the Internet, we lack a standard for that. Some big platforms each offer their own solutions, and when a consumer selects one of them, it becomes increasingly dependent because it has to give up more and more data to be able to use the services. Not only data about itself, but also about all the things around it.

> **Without a standard for digital trust and data control, the Internet of Things is, above all, a beautiful dream.**

And then there is another important obstacle. Often, the media suggest that "things" can operate autonomously. A fridge would have no trouble ordering a carton of milk, and a car would be able to decide to turn left on its own. That would mean that things could assume legal obligations, resulting in all kinds of uncontrolled situations. David Birch refers to this notion with the term "IDIoT," which stands for Identity of the Internet of Things[7], indicating that autonomy of things is a pretty naïve notion. People usually forget to mention that these things are always subordinate to other actors that act as their "guardians" and that are ultimately responsible for them. In other words, things first have to be linked to the identity of a person, business, or other organization before being able to assume any official obligations. In doing so, these owners give the things a derived digital identity and an—often ongoing—authorization. As such, many of these linked objects act "on behalf of" their owners. That is what is special about the Internet of Things: it creates a new type of actor, one that is robotized and delegated. So, the Internet of Things can only flourish once the owners (people or legal entities) have a broadly accepted digital identity with which they can authorize their "stuff" to act on their behalf.

It is predicted that, in the coming years, hundreds of billions of devices and things will come online. Not only will they monitor the locations and health of their owners, but also the status of the car and the household items they use. To enable this *connected* world to function, a shared infrastructure and shared trust are an absolute necessity. It is there where the foundation for mutual trust is created since all devices will be able to exchange the necessary data according to a universal standard. For that to succeed, user profiles have to be organized well and be managed by the users.

The perspective of the designer and digital activist Aral Balkan is an interesting one[8]. He talks about "cyborgs," people whose identities in the physical world have acquired an extension in the digital domain. In fact, he is talking about the digital extension as the direct derivative of a physical person. Personal data are part of the identity of the cyborg in question. When the digital identity of an actor has been unequivocally established, it becomes considerably easier to interact with other actors.

> Due to the coalescing of the physical world and the digital domain, people increasingly live as "cyborgs." Their physical identity has acquired an extension in the virtual dimension.

Multi-homing, i.e., joining multiple platforms to reduce one's dependence on them, will be increasingly difficult for consumers, as especially BigTech platforms offer very convenient, attractive, and cheap services in return for their data. There is not much short-term incentive to switch platforms, especially because one's social contacts would not switch at the same time. Competing "silos" are the result.

When we extrapolate the current development of the Internet of Things, we see a highly fragmented collection of closed platforms ("silos"), all organized according to the hub model, and competing with one another. As a result, the division of the risks, liability, and revenues of transactions is askew, with users on one side, and service providers, like banks, telecom operators, and energy companies on the other. Adoption will stagnate, which will eventually result in less attractive services and a smaller market for all providers. The transactional Internet can help transform that scenario because it will give users access to and responsibility for their own data. That will reduce risks for providers and make the services they offer accessible to the whole market. However, that does require standardization of digital trust and digital control, without which the Internet of Things will mostly remain a beautiful dream.

In the industrial world, the Internet of Things is often referred to as Cyber-Physical Systems (CPS)[9]. Think of automated production, autonomous cars, energy networks, and container ships unloading their cargo on their own. They all operate by self-learning algorithms that use the transaction data they generate as fuel for further learning. Like the Internet of Things, the large-scale success or failure of CPS depends on the existence of trust between the actors, because exchanges of goods and data cross the boundaries of legal entities, i.e., governments and companies. In this case, they are industrial "things," like production parts, robots, cars, energy plants, containers, and ships, and which have to be connected to an actor. They need to belong to an organization—and even to a specific person in that organization—that is responsible for the "thing." In that way, all the activities that are carried out in a car plant are far from non-committal. Parts are transformed into products—for instance, cars—which then have to be sold. This process consists of a series of interactions and transactions, with all the associated obligations, responsibility, and risks. That is why all the actors within a CPS network have to know exactly who they are dealing with.

DEEPDIVE

Industry 4.0, Industrial Data Space, and iSHARE

There are four important developments in the area of CPS, and where data are at the core of each. The German Industry 4.0 is about intelligent factories, and International Data Spaces is another large-scale, German project for data exchange, which provides the basis for it. The Dutch initiative iSHARE focuses on innovation acceleration based on data sharing in the international logistical sector. Let's take a look at all three.

Industry 4.0 is an umbrella term that refers to the automation of production systems, enabling the creation of so-called *smart factories.* By sharing data, managing these processes can be improved continuously, even when that involves external organizations, such as suppliers. Human intervention is progressively reduced. There are several challenges surrounding Industry 4.0, for instance with regard to the ownership and security of data, the inevitable loss of jobs, and a lack of people with the right competencies to operate such complex, heterogeneous systems. Nevertheless, it seems only a matter of time until Industry 4.0 becomes a reality on a large scale. In 2014, the city of Ohio, for instance, proclaimed itself to be an "Industry 4.0 demonstration city," in order to stimulate innovations and investments in production technologies[10].

The **International Data Space** initiative positions itself as the foundation of Industry 4.0, by reliably exchanging the necessary data about users—and their products and services—between parties from all kinds of markets. It is a virtual space, in which the secure exchange or simply connection of data is made possible. That is done by using shared governance models that generate standards, such as the IDS Reference Architecture Model (RAM)[11]. Only reliable and certified partners can join the initiative. The owner of the data—in this case, the participating organization—can determine which other parties can use the data under the agreed terms. The individual owners stay in control when data are being exchanged. In that way, partners from a certain market segment both have (legally secured) access to their connected data, which can lead to innovation in the form of new business models, improved processes, or other initiatives[12]. International Data Spaces could be seen as an ecosystem that creates a standard for data exchange for all the participating platforms and networks that have agreed to a T.R.U.S.T. Framework to make that possible.

In the Netherlands, iSHARE[13] is a similar initiative (for a focus on trust through identification, authorization, and authentication) that originates from the logistics sector. The aim is to encourage cooperation and innovation within the international and multimodal logistical chain (road, sea, river, air, and train), by simplifying data exchange and removing obstacles. Thanks to joint agreements about identification, authentication, and authorization, all parties in the sector can share data in a controlled and detailed way. This allows them to handle sensitive information without necessarily having to be in a business relationship. As a result, new logistical chains experience less friction, allowing them to scale more quickly and connect to each other more easily. In 2019 iSHARE and International Data Space started collaborating in this field of *data sovereignty*.

Gaia-X is the political initiative of network model data sharing[14]. Launched in 2019 by the German minister Peter Altmaier, Gaia-X aims to create ecosystems linking cloud and application together via a standardized set of T.R.U.S.T.-agreements. The association and community of corporates around Gaia-X grows fast and works toward delivering the required standards and subsequent adoption across the economy at large. Governments in the EU member states, too, are setting up community programs for awareness and adoption. The Gaia-X initiatives underline the political objective in Europe to realize a next digital paradigm where data is under control of people and business leading to an interoperable ecosystem of platforms, as opposed to platforms being the ecosystem, leading to a winner-takes-all dynamic.

Data Transactions as Multipliers

The biggest driver behind the growth of the number of online purchases is the ongoing digitization of the trade process itself. This has created the new category of data transactions, which, essentially, is located below the level of the actual trade transactions and which orchestrate the conditions for it. Where, initially, it was typically the payment that was carried out digitally, now all kinds of steps within the buying process are executed in a digital way. In addition, the buying processes in the physical and digital domains increasingly become intertwined. A purchase that is eventually made in a physical store is often the outcome of an entire *data journey*. The prospective buyer has already searched for information, compared alternative products and suppliers, and has taken some serious steps in the buying process. So, data transactions increasingly play a role in purchases in the physical domain, as a result of which the distinction between buying online and offline is blurring more and more.

> **The digitization of trade has only just begun.**

The further growth of the number of online purchases is also important in digitization. There is still enormous potential. We sometimes forget that, on a global scale, e-commerce is still in its infancy. In 2017, the online share in the total number of retail purchases worldwide was only 10.2 percent—albeit with an upward trend[15]. By 2021, this percentage had almost doubled (19.6 percent). On a global level, the share of cashless transactions in total payment traffic is still limited. In 2020, the global share was 7.8 percent, rising to 17.5 percent in 2021, more than expected. By 2025, the percentage is expected to increase to 21.5 percent. Sometimes, governments intervene rigorously, often with the aim of fighting illegal transactions. For instance, in 2016, India's government banned large denominations of cash money from one day to the next, to move the entire population toward digital transactions. That was not a smooth transition, and economists argue that it hurt India's economy, but the concerns about corruption and the black market prevailed[16]. China, too, also rapidly transitioning to a cashless economy, thanks to platforms like Alipay and WeChat. The country has the highest percentage of mobile payments in the world: 850 million people in China used mobile payment services in 2020[17]. In short, the digitization of trade has only just begun. The number of digital transactions will increase tremendously all over the world in the years to come. Another major political push toward cashless transactions is the so-called 'Central Bank Digital Currencies' (CBDC). All major central banks have launched research and / or realization projects for creating digital versions of cash[18]. The public may feel they already have 'digital cash' because their bank balances are digital. However, the most important feature of digital central bank money is that it is a liability of a central bank instead of a liability of a commercial bank, which can go bankrupt. In that sense, CBDC are more cash-like.

5.3 Two Big Fixes

The current Internet, however, still has a number of design flaws, making it unsuitable to function as fully fledged infrastructure for transactions. Middlemen solve the flaws with their ingenious platforms, allowing people to trade via the interactive Internet. Essentially, all of it is a lot of 'digital duct tape' because the infrastructure itself isn't made fit for transactions, but platforms are built on top of it to compensate for its shortcomings. This ever-expanding structure appeared to function reasonably well, but the considerable risks (data and power concentration, privacy) for all the actors involved are becoming more and more visible. The web, in its current form, is groaning under the sheer weight of it all, which doesn't improve the trust people have in the medium. In fact, the pressure of the growing number of transactions and the sheer amount of personal data are threatening to become too much for the Internet as we know it, with serious risks for everyone involved. So, there is a major challenge to manage the exponential increase in the number of transactions, which requires a stable transactional environment; a digital infrastructure that offers actors the necessary trust. For that to happen, all it takes is what we call the two *big fixes*.

> To turn the Internet into fully fledged transaction infrastructure, two "big fixes" are needed: breaking the trust paradox and restoring the data benefit balance.

The first big fix involves breaking the trust paradox, by which we mean that the trust in the Internet as a medium has to be restored. We have already seen that, at the moment, it is the middlemen with their platforms who provide institutional trust, by connecting large numbers of actors and collecting huge quantities of data. However, in light of the scandals surrounding data leaks and new phenomena like *fake news*, it is becoming increasingly clear that this is not the best solution, leaving aside the many privacy concerns. Human beings are fallible, including institutions that should be providing trust. That trust dilemma poses a serious risk for the web to break through as transaction infrastructure. How can this vicious cycle be broken?

The transition from institutional toward infrastructural trust is an essential step to take. Trust will no longer be facilitated by institutions such as platforms but be based on mathematical formulas and the cosmic laws of physics. Recent developments in blockchain technology and other innovations in cryptography show that infrastructural trust is a possibility. Blockchain often refers to that in a paradoxical way as a “trustless” infrastructure, whereas calling it “trustful” or “trusted” would be more fitting. Although blockchain still involves a lot of hype and misconception, and we still have a collective journey to make before blockchain can be part of any infrastructure, it provides a new perspective. In such an infrastructure, the dynamic user profile of actors is stored securely, to be managed by the user itself and, with its consent, provided to third parties.

The second big fix involves restoring the data benefit balance, which at the moment is very much skewed in favor of the platforms. This can be fixed by giving back-end users control of “their” data (data sovereignty). A growing discussion about the lack of transparency about what happens with personal data shows us where the problem lies. All the data that are needed for a transaction have to be available to both actors. This applies to both the input data that allow a transaction to take place in the first place and the output data resulting from the transaction.

In the next sections, we will address the two big fixes.

Big Fix 1: Breaking the Trust Paradox

Although platforms have managed to make transactions possible with an Internet infrastructure that was not designed for transaction, their role as digital trust providers seems to be approaching its end of life. As we indicated in the previous chapter, Coase stated that transaction costs are the result of dishonesty, mistakes, and opportunism during an economic exchange. Human actions—as individuals or as organizations—are, by definition, not completely reliable. This also applies to platforms that play an essential role in the facilitation of digital transactions. Their reputations as reliable trust middlemen are by no means spotless. In addition, the trust function often conflicts with their commercial objectives: end-user privacy and advertiser interests are hard to reconcile.

> **When trust is part of the infrastructure, it no longer depends on the fallibility of human action.**

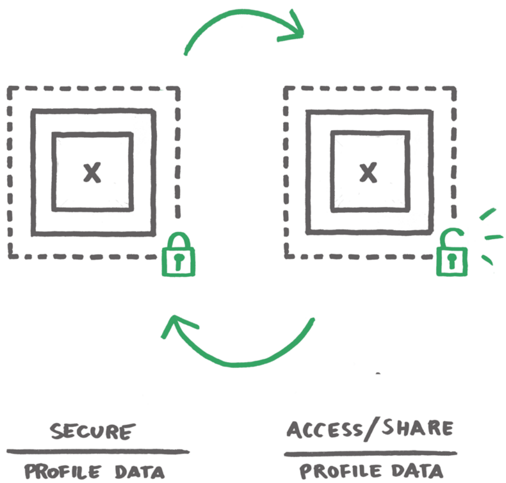


Figure 50. The trust paradox

This trust paradox can be broken by making trust part of the basic infrastructure of the Internet, instead of the platforms that have been built on top of it. That is possible because digital trust comes in the form of data that, in theory, can be reused an infinite number of times. When that has been realized, there will no longer be fallible institutional trust, but trust that is built on ironclad laws of physics, i.e., infrastructural trust. The transaction costs resulting from flawed human interventions will then be reduced to zero. Technology like blockchain shows that there are opportunities to make that happen. Unfortunately, in the US, there has been an opposite development when it was decided to abandon net neutrality[19], even though by now, there is growing resistance to that decision[20]. It is still the subject of debate, which is fortunate because it is a serious threat to the transactional Internet. See also the background information about this in the first chapter.

To create such a trust infrastructure in Europe, it is possible to work together in a network model, where a standard can be developed on the basis of the T.R.U.S.T. Framework, so that the current fragmentation on the trust market will be a thing of the past. End users will no longer have to go through a separate onboarding procedure for every platform but will be able to identify themselves in the same way everywhere in the digital domain. Initiatives like Gaia-X, IDS, and iSHARE pursue this vision through concrete community-driven action.

What does it mean when trust becomes a part of the infrastructure? What will the customer journey look like and how will the new transactions take place? The end user will have more control of its own buying process because it has more control over its data, and in the transactional phase, the relationship between buyer and seller will be in complete balance. However, we are not there yet. In the current interactive stage, there is still a lot of platformation. That is, in each step of the customer journey, the platforms make sure there is enough trust, enabling interactions and transactions. Middlemen are responsible for the platformation of the buying process by facilitating as many steps of their own value chain themselves with their longitudinal platforms. In many ways, this has made the lives of the users a lot easier, but it has also created a situation in which the platforms are able to influence the buying process to a large extent. They do so by creating as many touch points as possible with potential buyers, and by using the data resulting from interactions in those touch points. The recent development in Web3 and its adoption in the financial applications, give us a glimpse of what is to come. Here we see users in control of their data (mainly representing financial tokens) and the use of middlemen is optional. Transactions are peer-to-peer and secured by advanced cryptography.

Once the end user is more in control of its data—the second big fix that is discussed in the next section—it can co-determine the customer journey by deciding for itself who has access to its personal and business data and at what stage. This makes it easier to find for relevant providers. From the scattered data sources at, e.g., banks, insurers, energy companies, telcos, universities, governments, and medical institutions or from a *data wallet*, users can choose which personal information they want to provide, to whom, and under which terms. Earlier, we called this *progressive disclosure*: at each touch point, additional information is provided before moving on to the next step in the process. This allows for customized interactions that can lead to a transaction. We concluded earlier that the roles of supply and demand could switch much more easily in this new phase. Sometimes, an actor will be the buyer, at other times, the seller. In its role as supplier, it will also have access to the data of potential buyers, for which it is responsible. Privacy regulation will also affect it in two ways: as a consumer, protecting its rights; and as a supplier, with the obligation to meet certain conditions.

> Within the new customer journeys, buyers and sellers interact more directly with each other, allowing them to switch roles more easily.

Soon, it is really the consumer's turn, according to American journalist Doc Searls[21]. The consumer will start building its own loyalty programs, dictate its own service levels, and even impose its wishes upon entire markets; what it wants, how, where, and when. Searls calls this "The Intention Economy"; an economy in which supply and demand find each other in a more direct, efficient, and powerful way than ever before. Not the supplier but the consumer dictates the rules, and suppliers are forced to respond to the customer's actual needs instead of vying for the attention of many consumers. There will be less need for marketing. By offering the right propositions, a supplier will automatically be matched with clients. As a mirror to Customer Relationship Management (CRM), there will be a consumer-driven Vendor Relationship Management (VRM), with customers as the initiating parties. When a traveler walks out of an airport, for example, and wants to rent a car, it can send a message to all available providers. Searls suggests the possibility of users linking each company to a separate "address." That way, it can make combinations of services from various companies, in real-time, based on its own requirements, while a personal, verifiable account is kept of all its interactions with the market. In the intention economy, customers operate much more autonomously. The economy becomes more and more a machine that aligns the intentions of a wide variety of actors.

Whether or not Searls' vision becomes a reality, it is certain that the two roles of buyer and seller, are increasingly balanced. Potential customers and providers find each other much more easily and increasingly offer themselves. An important advantage for providers is that they no longer have to collect vast amounts of data from which to filter possible prospects for certain products or services—either themselves or via expensive middlemen like Google or Facebook. Buyers and sellers will also increasingly switch roles: sometimes you will rent your car to a tourist; next time, you're in Paris, you'll want to rent a car yourself. From both positions, buyers and sellers can actively steer the buying process, making the customer journey a more equal one. In addition, the buying process will be more effective because supply and demand are getting closer together by the direct sharing of user data. That makes products and services easier to find. The handling also becomes more efficient because fewer interactions are needed to organize the trust for actors to conclude a transaction.

The new transaction

How will the transaction trinity (agreement, payment, delivery) develop within the new customer journey? An important aspect is that transactions carry considerably less risk, which reduces the trust function of platforms. It is easier for actors to conduct transactions themselves. All the interactions with the platform that used to be necessary to organize the required trust will have become redundant. As a result, the transaction process is a lot less complex, and it requires fewer parties. The use of middlemen can be optional, as we see in the world of Web3. That also means that customers and providers will be able to do business with each other more and more directly, without middlemen.

Earlier, we pictured the transaction as a triangle connecting the sub-processes agreement, payment, and delivery, with the risk perceived by the actors in the middle. Initially, there was a higher risk perception within the digital domain, as a result of the asynchronicity of transactions: the three processes are separated in time and place, and the parties involved often don't know each other. That generates additional uncertainty, with the one party typically experiencing the converse level of risk of the other. The relatively small risk space between buyers and sellers that exists in the physical world is blown up considerably in the virtual domain. This provides opportunities for a variety of trust platforms that fill up that trust gap and use it as a basis for their revenue model. By removing the additional uncertainties, the platforms manage to reduce the risk space for their own business to the usual proportions. Within the transactional Internet, that is no longer necessary because the additional risk will be corrected in the trust infrastructure itself, as platforms operate in an ecosystem where users are in control of their data. This will create the "mother of all platforms," which will function as a universal trust environment. Single platforms will not be our digital ecosystems; instead, users will get more value out of a multitude of platforms. Ultimately, it makes no difference whether transactions take place in the physical or the digital domain. In both cases, the size of the transaction triangle is similar, as we can see in Figure 51.

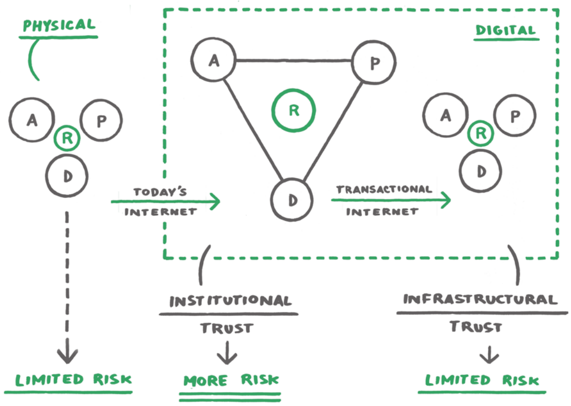


Figure 51. The evolution of the risk space in transactions.

As we saw earlier, new dynamics are created that broaden the concept of "payment." For instance, end users can monetize the value of data accumulated using digital services and apps in a transaction. For example, giving *likes* on Facebook, providing personal information to gain access to extra functionalities, or submitting coupons. So, "digital payments" are much more than traditional payments with money. Thanks to the reduced transaction costs, it will also be interesting to exchange very small value units. In combination with the enormous reach that can be created in no time, this can lead to large numbers of micro-transactions, allowing our economic actions to take off in a major way. Mini-amounts, like a hundredth of a cent, which can be paid with a simple action, can generate an enormous amount with the right conversion. Within the peer-to-peer economy, micro-transactions can also be settled immediately, without the costly intervention of institutions or platforms. This enables all kinds of new revenue models, whereby the purchase of data will become more expensive because users increasingly control—and sell—their own data. A YouTube channel about Brazilian cigar brands, specialist legal advice, or high-quality research journalism—if enough people are willing to pay a tiny amount, quickly, simply, and reliably—can ultimately provide an interesting revenue model.

> With the transactional Internet, transaction costs are drastically reduced, which gives a new impulse to the number of transactions.

Big Fix 2: Restoring the Data Benefit Balance

At the moment, users are the big losers in the data game that takes place below every interaction or transaction. After all, each transaction is made possible by a series of data transactions that take place at an underlying level. The resulting transaction data leads to user profiles which represent substantial value, and at the moment, these are being exploited by the major platforms. This is unbalanced because the data are, by definition, owned by both actors involved, as an integral part of any interaction. But today only one actor has a full insight into the profiles. The data subject himself is not able to functionally do anything with it, despite GDPR regulation; without data no interaction, and without interaction no data, as we saw in Chapter 4. This urgently calls for a second big fix: restoring the data benefit balance. The end user will have to be given back control of its personal data in such a way that it will be a serious participant in the data game.

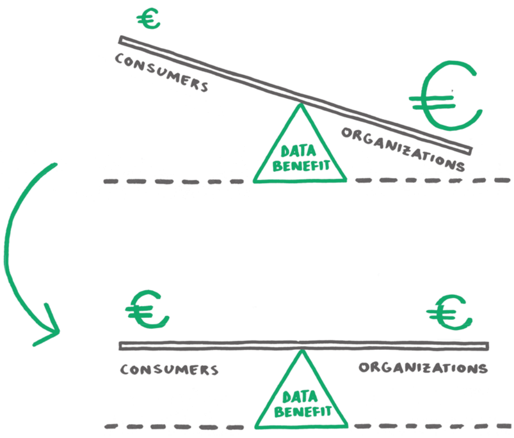


Figure 52. Restoring the data benefit balance.

This is not an idea that most middlemen will welcome at first. However, the current situation also carries substantial risks for them, as the data leak from Facebook to Cambridge Analytica in 2018, for example, shows. In addition, European privacy legislation forces all parties processing personal data to do so in consultation and with the explicit consent of the users. That consent has thus become a transaction in itself: a user agrees that the platform may use its data for a certain purpose, which immediately results in legal rights and obligations for both parties. Platforms that fail to obey the rules, risk having to pay fines that, per incident, can be as much as 4% of their worldwide turnover. So, the risks involved are substantial and will only increase in a world where the number of transactions is about to explode. In addition to being an *asset*, for many parties, data are also becoming a *liability*. In the long term, a "Basel"-like[22] regulation in which an organization has to take financial measures in relation to the amount of personal data for which it is responsible, does not seem unthinkable.

Companies run a substantial risk with data through a combination of stricter privacy regulations and the number of (data) transactions, which is about to explode.

How did this situation come about? Let's start by outlining the background of data transactions. In the 1990s, when the Internet was starting up, it had no power center; it belonged to everyone. Everyone could start working with it, but it turned out to be pretty complex to build and maintain a website yourself. Nowadays, that is a lot easier. Thanks to companies such as WordPress, Wix or Squarespace and many others, which facilitate the process, it is possible to have a website with just a few clicks. And for most people, that is hard to resist.

At the moment, in the Western world, Facebook dominates social media, Google the search engines, and eBay the auctions. In China, the situation is similar, with companies like Alibaba, Taobao, and WeChat dominating the web. Centralisation through the platform model is the name of the game. The increasingly digitized world is built on ease-of-use and the immediate availability of services via smartphones. We are at a pivotal moment, where the Internet has the option to 're-decentralize', based on the T.R.U.S.T. model and continue to provide us with life-improving and valuable services.

Data have become the underlying value being exchanged for many "free" online services, but users pay for those services with their data. The select group of powerful platforms are all too aware of this; every day, they collect a mountain of information from billions of users. Within a fraction of a second, Google provides a relevant answer to any question people can ask, all thanks to smart algorithms that have been built on the combined data flow from all its users over decades. Together, we have taught Google a lot. Even to the point that, if the data flow were to stop now, they would still be able to keep providing their services based on the insight and knowledge they have accumulated. Those are unique, and only they possess them.

At the same time, these influential platforms are getting more and more grip on users. That is not always a pleasant experience because today, people operate in two realities: in the physical world and in the digital field. By being active on the Internet, but also elsewhere, based on the data that are being generated, a digital user profile is created almost automatically, which we can see as an extension of our physical person. It is impossible to escape all this data tracking; cameras, satellites, the software on a laptop computer—they are all designed to collect information. But data are also collected in stores where we shop, the phone calls we make, and the messages we send. There is no escape unless you ditch civilization, move to a mountaintop, and live as a hermit.

> There is an urgent need for tools with a wide reach, which help all types of actors manage their data.

The growing wish of individuals and governments to have a certain level of control of these personal data seems logical. After all, data are becoming a more important part of people's identities. That is reinforced by the fact that data function more and more as a form of money with which certain services can be paid for. When an actor shares information about itself, it gets value in return, in the form of a digital service, money, points, or a discount. So, it isn't strange that more and more people want to place the control of data with the person generating them. The Web3 and SSI movement work from this idea.

> **"The data we create about ourselves should be owned by each of us, not by the large companies that harvest it."—Sir Tim Berners-Lee**

Sir Tim Berners-Lee, one of the inventors of the web, also agrees with this approach. In his vision, all the data that we create about ourselves should also belong to us and not to the large companies that harvest data in enormous quantities[23]. At the moment, those data are mostly used for targeted advertising, as a result of which consumers often get the sense that someone is "spying" on them. Berners-Lee states that available data can be used much better if users have access to their own accumulated data in all available sources, from social profiles to bank accounts. He calls this "rich data," as opposed to "big data." Consumers could provide providers with access to their rich data (on request), on their own conditions, generating new, interesting business models, while at the same time respecting people's privacy. However, that would require a transformation because it would mean that companies are no longer completely in control of the data since end users would play a bigger role.

To realize his ideas, Berners-Lee started working with Solid, a system where personal data remains in possession of the actor involved, who gives access to them for applications it itself selects. With Solid, individual users can store their data in *pods, personal online data stores*, which are hosted wherever it wants. Solid is not only a decentralized storage system, but it also authorizes people requesting access to a person's data. Solid will only provide the requested access after the user in question gives its consent. This means that personal information is not controlled by a central party but is stored in a decentralized way in a variety of locations[24]. In UK, MyDex and Digi.me[25] provide software with which users can manage and enrich all their data and provide access to suppliers under certain conditions. So, the necessary technology is already there.

The ability for users to actively manage and share personal data is an essential function of the transactional Internet. Users have access to tools with which they can manage, for example, data about their income, address, shoe size, allergies, and bank statements, as well as being able to share the data with others. It is important to make a distinction between the data themselves and access to the data. To give users control over their personal data, there are two approaches: centralized and decentralized storage of the data. In other words, by using either a hub model or a network model. The data can be located at a personal data store (or wallet)[26] for the consumer or at institutions like banks, governments, telecom companies, or combinations of them, which are part of a transactional infrastructure. In both models, the control and the authorization for access to the data have to be in the same hands, namely those of the creators themselves. There is an urgent need for tools that help actors organize this decentralized data control. The use of such functionality is greatest when it is designed immediately as a symmetrical proposition, so without making a distinction between the type of actor and the associated role. Sometimes, an actor will give access to the data, and at other times, it will be the one who is given access. That means that, when it comes to sharing data, all kinds of actors—citizens, consumers, businesses, and governments—should adopt a standardized approach, as we are used to for other markets, like telephony, SMS, and e-mail. That would really speed up the adoption of such a tool, making it possible to create a great reach within a short time frame. In addition, the *peerification* we discussed in the previous paragraph will also speed up enormously.

Whereas European regulation supports the developments toward a transactional Internet, things are very different in the USA. In 2017, the US passed a law allowing companies to trade data about users without the consent of those users[27]. Earlier, we saw that the US had already abandoned net neutrality, whereas Europe is very much in favor of it. Both decisions by the policymakers in the US are a serious step backward. Paradoxically enough, these two decisions are more likely to weaken the position of the American tech companies rather than strengthen them, especially in the long term, while they are in such a prime position to benefit from the opportunities provided by the transactional Internet. Today's platforms have the option to lead the way in creating data ecosystems, instead of being 'the ecosystem' themselves. The recent European privacy regulation and directive[28] for data sharing is at odds with American policies that give consumers the necessary legal framework to take control of their own data. Companies must enable their customers to give verifiable consent (authorization) to use their data for specific applications. This has turned data exchanges themselves into transactions, in the sense of a quid pro quo, and not just a mere side-effect of a transaction. Put differently, the focus is shifting from transaction data to data transactions.

Chances are that the market for decentralized data control will start off fragmented, as every company will feel the need to go it alone to meet the requirements of the new privacy regulation. All parties will organize this in their own ways in their own distinct portals. That means that users will have to start managing their data in different locations, with separate tools, much like we see today. That fragmentation does not contribute to the sense that users have control of their data. In fact, there would still not be much they could do with their data.

CASE

Web3

Web3 can be seen as a move away from increasing data concentration. This concept is referenced several times throughout this book as an example of the shift from institutional to infrastructural trust. The trust comes from the design, which gives the user control over their data—protected by cryptographic methods that the user can control directly. In the world of Web3, users carry their own personal data with them, rather than opening accounts in different places as they do on Web2. Decentralized finance (DeFi) clearly shows how this can work. Users store their identity in a digital wallet. If the user has "connected" to a payment, credit, or exchange service, the financial service provider uses this user data to provide its services. This access is the reverse of the classic log-in procedure that we know from the Web2 world.

The upcoming introduction of the eIDAS 2 regulation in the EU, which aims to make the use of user-controlled standardized digital identities the norm, will further push this user-centric paradigm.

It seems likely that this fragmentation will be perceived as too much of a limitation after a while. A universal standard for data control and exchange is the logical response to the call for (technical) collaboration. Such a universal standard can be developed by multiple participants in a network model, allowing for "many-to-many" data exchange, in a similar fashion as, e.g. e-mail, GSM, and payments are well-established examples of "many-to-many" data exchanges. It will make the lives of both users and businesses a lot easier. Whether or not there will be enough commercial incentives for such an approach depends on the question of whether a business model can be found that takes into account the incentives of all the actors. That business model could include, for example, an alternative for the growing advertising revenues, which at the moment go to a smaller number of platforms, but from which all actors could, of course, benefit in the future. Another scenario involves the government forcing a solution through regulation. We see that, in Europe, data sharing is increasingly prominent on the political agenda. At a national level, we see the German and Dutch initiatives mentioned earlier, and at EU level, various policymakers are also working on this subject, based on the insight that data sovereignty is a condition for an ongoing digitizing society. Regulatory proposals (Data Act, Data Governance Act) and the Gaia-X initiative as concrete signs of Europe's direction and ambition. This means that virtually every economic sector, in addition to all governments and private individuals, will be dealing with this. In 2017, Australia already took the lead with their Consumer Data Rights regulation that spans all sectors, starting with banking and then energy.

An infrastructural approach based on the network model appears to make the most sense here. A new kind of "soft" infrastructure, based on a T.R.U.S.T. Framework, as opposed to "hard" infrastructures such as roads, energy masts, airports, data centers, and railways. With such an infrastructural approach, we can create an alternative to the dominance by a few hub players over the data assets of companies, governments, and people. The GSM story is an inspiring example, where European fragmentation formed the basis for T.R.U.S.T. agreements. These, in turn, have led to a global network of collaboration as well as competing players in the telecom market. This took place without making a distinction in use between individuals, or governments, as befits any infrastructure.

5.4 The Digital Agenda for Leaders

Most organizations are not aware of the risk that the exponential growth in the number of digital transactions entails. As said before, although they expect growth, they appear to systematically underestimate it, which means that the steps they take are not nearly enough to solve the problem, as we can see from Figure 53.

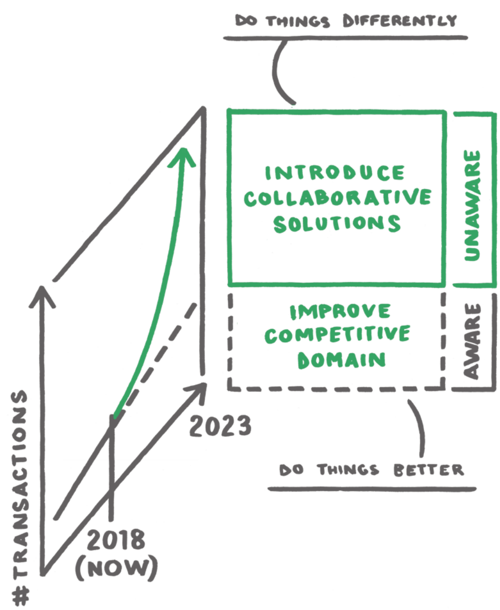


Figure 53. Underestimation of the exponential growth of the number of transactions leads to ineffective solutions and measures, and to digital chaos.

To make the Internet truly transaction-proof, using band-aids or digital duct tape is no longer enough. What is required is a structural approach that involves all the stakeholders. Solutions at an organizational level fall short in advance, and collaborative solutions that unlock new business models are needed instead of optimizing existing ones.

It is no small feat to get the two fixes done and make the transactional Internet come to life. A tremendous amount of innovation power, willingness to collaborate and changed behavior, both at a business and societal level, is required for this. Such disruptive change asks for true leadership and a clear agenda.

> **Ask not what your transactions can do for you; ask what you can do for your transactions.** — Free after John F. Kennedy

Policymakers & Regulators

GOAL

Enabling the transition from institutional to infrastructural trust, thereby creating a level playing field

Agenda

- The realization of an international, interoperable, digital trust infrastructure with safeguards against market and government power. A first step is the organization of interoperable, digital identity infrastructure. There are plenty of examples all over the world; for instance, in India (Aadhaar, hub model), Sweden (BankID, network model), Germany (Yes, network model), and the Netherlands (iDIN, network model). This identity infrastructure has to be usable for individuals as well as organizations.
- Facilitating a “consent infrastructure”; building on the digital identity infrastructure. This “soft” infrastructure also works for all kinds of data (from all sectors) and actors (individuals, businesses, and governments) in the same way.
- An inventory of which institutional responsibilities could be embedded in a digital trust infrastructure.
- The legal embedding of infrastructural trust.
- The recalibration of legislation about data responsibility and liability between the various actors (as a result of data rebalancing and peerification, rights and obligations of end users and organizations will move closer together).
- Assuring net neutrality.
- Communication (coordinated with the business community) aimed at creating awareness—also in one’s behavior—with regard to data and trust of users in their roles as citizens and employees.

Businesses & Organizations

GOAL

Controlled growth of transactions and transaction data.

Agenda

- The recalibration of the corporate digital transformation agenda on the basis of the starting points of the two big fixes: breaking the trust paradox and restoring the data benefit balance.
- Taking on 'digital sustainability' as part of Corporate Social Responsibility (CSR). Acknowledging that our digital environment needs special care, just as our physical surroundings.
- Enable customers, suppliers, employees, and other stakeholders to manage their data and enable them to reuse this outside of one's organization; applying lessons learned and reusing standards from other sectors.
- Cross-sector collaboration on a digital trust infrastructure (based on the network model for ecosystems) from the understanding that this must be sector and user agnostic: everyone has to be able to work with it. Like we are used to with any infrastructure.
- Integrating the principles of the *sharing economy* and *peerification* in products or services and in business operations.
- Developing and facilitating (business) models regarding consumers in control of their personal data and an interoperable infrastructure.
- Give customers and other directly involved actors control of all their transaction data. Also, give other involved parties, such as partners, supervisors, and suppliers, insight into relevant parts of the transaction data.

- Communication (coordinated with the government) aimed at creating awareness—also in one's behavior—with regard to data and trust of users in their roles as citizens and employees.

Platforms & Big Tech

GOAL

Responsible data risks, data sovereignty and the distribution of revenues from data among the actors involved.

Agenda

- An inventory of the institutional responsibilities that can be embedded in a digital trust infrastructure, and its development and implementation.
- Empowering platform users to reuse their data outside of the platform.
- Collaborating to realize a shared trust infrastructure, making platforms an integral part of the resulting ecosystems where users can freely move in between platforms without loosing their friends and their data.
- The further development of data wallets (propositions) for end users, building on the shared trust infrastructure.
- Developing and facilitating (business) models regarding e-identity and personal data, and an interoperable infrastructure.
- Facilitating the portability of transaction data.
- Continuously evaluating the terms and conditions in the spirit of a networked trust infrastructure.
- Communication (coordinated with the government) aimed at creating awareness—also in one's behavior—with regard to data and trust of users in their roles as citizens and employees.

Research & Science

GOAL

Fundamental research and behavioral analysis in relation to infrastructural trust.

Agenda

- Researching the societal impact and opportunities in relation to the restructuring of trust.
- Further developing of solid, but easily applicable encryption technology for businesses and consumers.
- Researching and developing large-scale decentralized data architectures.
- Researching human behavior and the role of incentives in the adoption of digital trust infrastructure.
- Communication (coordinated with the government) aimed at creating awareness with regard to data and trust of users in their roles as citizens and employees.

Consumers

GOAL

Early and active participation in new transaction and trust concepts.

Agenda

- The awareness of one's own responsibility in the digital domain.
- Being open to and actively participating in innovations.
- Actively giving feedback about innovations, so that they can be improved.
- Actively claiming the rights to one's own data and data benefits.

- Reminding organizations of their responsibility about data management.

5.5 Summary

In this final chapter, we described two big fixes that are necessary to make the transactional Internet happen.

- To move the development of the imminent *transactional Internet* in the right direction, a shift is needed from institutional toward infrastructural trust where users are in control of their data
- The *exponential growth* of the number of transactions is fueled by three trends: the new Internet users who will be economically active in the digital domain, the *sharing economy,* and the Internet of Things. This growth is accelerated even more by a new category of transactions: data transactions. As a result, the number of transactions will increase fifteen-fold (to 5,500 billion) between 2018 and 2025.
- The current sharing economy is a predecessor of *peerification*—a trend that will activate an entirely new domain of economic activity, in which the residual capacity of things will be used more effectively. This will result in a strong increase in the number of trade transactions. Peerification presumes a more symmetrical exchange between two equal actors that can switch roles, are able to find each other more directly, and can easily establish each other's trustworthiness. This requires symmetrical propositions.
- The most important driver of the number of digital transactions is the *Internet of Things*. Because more and more physical products and devices are connected to the Internet, a whole new category of actors is coming online. In theory, these "things" can carry out an unlimited number of transactions with other actors. To allow the Internet of Things to flourish, the owners first need a widely accepted digital identity with

which they can then authorize their objects. As long as this "things identity" has not been organized, the IoT will mostly remain a beautiful dream with many separate applications and little interoperability, and a lock-in of users.

- The increasing digitization of the trade process itself provides an additional *multiplier* to the growth of the number of digital transactions. It is the result of the new category of data transactions, which take place below the level of the actual trade transactions and orchestrate the conditions for these.
- To turn the Internet into a mature transaction infrastructure, two "big fixes" are needed: breaking the *trust paradox* and restoring the *data benefit balance.*
- *Big Fix 1*: although platforms play an essential role in the generation of digital transactions, their reputations as reliable trust middlemen have been called into question. That trust paradox can be broken by making trust an element of the basic infrastructure of the Internet, rather than of the platforms that have now been built on top of it.
- In that case, there is no longer the fallible *institutional trust* that we have today, but trust that is based on ironclad laws of physics: *infrastructural trust*. In addition, transaction costs will, in theory, be reduced to zero, making transactions much cheaper for everyone involved.
- *Big Fix 2*: end users need to be given back control of their (personal and business) data in such a way as to make them serious participants in the data game, and for the data benefit balance to be restored. This requires the development of a "soft" infrastructure for data control and sharing that is omnipresent, much like a "hard" infrastructure (for instance, roads, energy masts, and railways).
- The *dynamic profile data* of actors will then be part of the transactional Internet and be under the direct management of the actor (data subject), who will then give *explicit consent* to third parties to access its data.

- Platforms and other businesses will also benefit from these two interventions: they are responsible for an unimaginable amount of personal data, which will only increase, and are exposed to substantial risks. First of all, because of the fines that can be imposed on the basis of the new European privacy legislation. And secondly, because users are becoming increasingly dissatisfied about things like data leaks as well as the uneven distribution of data benefits. In a worst-case scenario, people switch to a better alternative when this arrives.
- To make the Internet genuinely transaction-proof, digital duct tape is no longer enough. This requires a more *structural approach* that involves all the stakeholders. Solutions at an organizational level (hub model) will never be good enough. What is required is *collaboration* on the basis of the T.R.U.S.T. Framework and the network model, which leads to new business models for the digital economy, instead of trying to patch up existing ones. To that end, we have drafted a digital agenda for all parties involved. Platforms become part of the ecosystem, instead of them being 'the ecosystem'.
- The rapid growth of Web3 is a step toward creating infrastructural trust on a global scale and can be seen as a first manifestation of the *transactional Internet* where users are in control and actors operate within an ecosystem based on T.R.U.S.T. principles.

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thanks

We have learned that writing a book is no small feat. We have the greatest respect for any author who manages to pass this test. We have also learned that it isn't something that you do on your own, but rather, with the support and contributions of a lot of other people—from putting words to paper via projects to invisible contributions to the views in the book. As far as we are concerned, Bernard de Chartres expressed it to perfection in 1159, and Isaac Newton repeated it in 1675:

"We stand on the shoulders of giants."

At the risk of forgetting some "giants," here are ours:

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about

As an international consultancy, INNOPAY focuses on "everything transaction." In other words, everything that has to do with digital transactions.

Leaders in both the private and public sectors are increasingly faced with the opportunities and threats of digitization. Recurring themes are: How to deal with new, open business models? How to use new technology to innovate more quickly? To avoid disruption, or perhaps to cause it? How to serve customers better with more data about them and at the same time with more grip on their data for them? How to contribute to digital sustainability?

Since 2003, INNOPAY has been a recognized pioneer in the digital domain of two-sided markets, with "all-to-all" issues. In the form of strategic assignments, innovation projects, and the market implementation of new products and services, but also in collaboration at the sector level. On the basis of hands-on experience with projects such as iDEAL, Simplerinvoicing, iDIN, and digital identity projects in Germany, Switzerland, and Australia, INNOPAY has developed its own vision on "soft infrastructure." How we can make digital services work securely, easily, and sustainably for entire countries, continents, or the world. So, all sectors, big, small, private, government, citizen, and consumer.

Over time, INNOPAY has become a leading international player in Amsterdam and Frankfurt, and Berlin, who, together, have their own views and perspectives. A logical consequence of consistently choosing the most innovative road to help your customers in their digital §challenges.

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About The Authors

Chiel Liezenberg

started INNOPAY as a hands-on entrepreneur with a passion for technology, product design, and connection. He initiated various payment innovations and fintech companies and holds several patents. Various publications of his have helped shape shared theoretical frameworks in the transaction industry.

Douwe Lycklama

is the co-founder of INNOPAY and one of the thought leaders in various types of digital transactions, such as data sharing, payments, invoicing, identity, and relevant applicable regulations. His drive is to bring innovations in these areas to companies and governments, and to help them innovate collaboratively to materialize opportunities in digitization.

Shikko Nijland

is CEO and managing partner of INNOPAY and has more than twenty years of international experience in management consulting. He has previously worked for EY, KPMG, and Accenture, where he managed the growth and innovation practice. He is responsible for new INNOPAY propositions involving data sharing, customer in control, openness, and digital transformation.

Others on Everything Transaction

Dutch "Management Book of the Year 2019"

"Because of the social and economic importance of the topic, because of the necessity for every organization to understand it, because of the thorough analysis, because of the clear direction of development, because of the agenda that points out their responsibilities to a multitude of stakeholders, and despite the fact that of all the reviewed books it may demand the most from the reader—that is why the jury unanimously and wholeheartedly chose *Everything Transaction* ("Alles transactie") by Chiel Liezenberg, Douwe Lycklama, and Shikko Nijland."

- Pierre Spaninks, Chairman of the Jury of the Dutch Management Book of the Year Award

"A fascinating new perspective on the digital economy, and helping to understand the challenges of the future of digital trust."

- Dr. Neelie Kroes, former European Commissioner for Competition, and for Digital Agenda

"Everything transaction helps us understand how new economic systems disrupt older ones and how competitive advantage will increasingly shift toward platform ecosystems."

- Sangeet Paul Choudary, bestselling co-author of Platform Revolution and HBR Top 10 Ideas 2017

"I found this a thoughtful examination of the transition from an internet of interactions to an internet of transactions. It is especially valuable because it full of insights that are based on real-world experiences."

- David Birch, bestselling author of Before Babylon, Beyond Bitcoin and Identity is the New Money

"Everything Transaction offers an innovative perspective on digital transformation, by three successful pioneers."

- Prof. dr. ir. Kitty Koelemeijer, Nyenrode University

"A very relevant overview of the revolution in buying and paying caused by the Internet. The authors manage to draw a convincing picture of the far-reaching shifts that result, and the role things like trust, data, as well as middlemen and platforms have in this."

- Dr. Gottfried Leibbrandt, CEO of SWIFT

"Indispensable for anyone who is active in the world of digital transactions and who is looking for new insights into the relationship between data and trust."

- Enny van de Velden, chairman of the board and CCO of CCV

“The authors have spent years rewriting the future of the payment industry. With this book, they make this sector, which is on the verge of major changes, accessible for virtually everybody.”

- Willem Middelkoop, bestselling author of *When the dollar falls* and other books

“Everything in our universe is connected and transaction is transformation in action. On the eve of the transactional Internet, the authors answer the questions today that will be asked tomorrow. A must read for every entrepreneur.”

- Kees Zegers, founder of nu.nl and author of *Start capital*