

Preface

Most anywhere in the developed world, I can use a small rectangular piece of plastic, issued to me by a bank I have never visited, to obtain local currency or purchase goods and services directly from a merchant. The cashier and I may not even speak a common language, and the face of my card may look quite different from those carried by locals, but the cashier will nevertheless recognize my card as an acceptable form of payment. My account may be measured in a different currency unit from the merchant's, but no haggling over foreign exchange rates needs to take place. Although my bank may be on the opposite side of the world and closed for the night, the cashier can insert my card into a small, relatively inexpensive terminal and in a few seconds receive what amounts to a guarantee of payment. Even if our respective banks participate in entirely different banking systems, that merchant will have access to those funds, converted to local currency, generally within a day.

It is perhaps a sign of the increasing rate of technological change that we, after a relatively short period of time, have ceased to find this surprising. Fifty years ago, paying for goods and services outside your local area typically required the use of pre-purchased local currency or travelers cheques, and if you ran out, your options for obtaining more funds away from home were limited. Today, we hardly think twice about leaving home with nothing but a payment card, and rarely reflect on how these little bits of plastic, as well as the systems they access, have fundamentally changed the ways in which we exchange monetary value. As with countless other technological innovations, we have come to regard these electronic payment networks as “normal” or even “natural.”

But there is nothing “natural” about electronic payment systems. Although those born after the 1990s might never have known a time without them, payment cards and the electronic networks they activate went through an explicit process of creation and adoption, a process which actively shaped these systems into what they are today. If one wants to understand why these systems ended up the way they did, one first needs to understand their origins, and how decisions made in their early years fundamentally shaped the way they evolved.

This book recaptures the origins of one of these systems in particular: the electronic payment network known as “VISA.”¹ It traces in detail how this system was designed, built and actively adopted from the mid-1960s through the early 1980s. This period encompasses not only the system’s foundational years, but also its most prolific period of innovation. It was during this period that the system transformed from a collection of disintegrated, localized, paper-based bank credit card programs into the cooperative, global, electronic value exchange network we know today.

What is Visa?

Before we discuss why Visa might be an interesting and important subject, we first must understand a bit about what Visa is. Unless you have worked in or studied the banking industry, Visa is probably not what you assume it to be. Many readers may be surprised to learn that Visa itself does not actually issue cards. Visa is not a bank, nor is it a public utility or a governmental institution. Visa does not extend credit to consumers, nor maintain their accounts. It does not recruit business to accept the cards bearing its name, nor does it maintain their accounts either. It does not even build nor sell those little point-of-sale terminals used to read the cards. So what *is* Visa, and what does it actually *do*?

Visa is in essence an *enabling organization*. For most of its history, it has been an effectively not-for-profit cooperative membership association, owned and governed by the same set of financial institutions it serves.² Visa provides an infrastructure, both technical and organizational, in which multiple competing financial institutions can cooperate, just enough, to provide a service that none could have realistically provided alone. In short, Visa makes money *move*.

Today, the Visa system makes a rather significant amount of that money move—about \$4.8 *trillion* (USD) each year and rising.³ Close to 16,000 financial institutions from 200 countries and territories now participate in the system, either by

¹As we shall see, VISA is technically a recursive acronym for Visa International Services Association, but it is typically referred to simply as “Visa” after first use.

²Visa was legally organized as a for-profit, non-stock membership association but since it did not issue stock and was solely owned by the same institutions that provided its operational funding, it effectively operated as a non-profit. Any accumulated net revenue amassed by the organization was either put back into operations, or was used as a settlement reserve in compliance with the Basel accords.

³For current statistics on Visa, see <http://corporate.visa.com/about-visa/our-business/global-presence.shtml> (accessed 3 August 2010). For comparison, MasterCard’s sales volume for 2009 was \$2.5 trillion, and American Express’s volume was \$620 billion. Volume figures come from each company’s respective annual report to shareholders. In America, checks still account for the majority of non-cash payments in terms of dollar volume (nearly ten times Visa’s dollar volume in the US), but only 30 percent of the total number of payments. See *The 2007 Federal Reserve Payments Study*, available at http://www.frbservices.org/files/communications/pdf/research/2007_payments_study.pdf (accessed 5 August 2010). The use of checks has been steadily falling for the last decade, so cards may soon surpass checks in dollar volume as well.

issuing some of the 1.8 billion cards in circulation, or by representing merchants that accept those cards. Visa's technical infrastructure now processes around 66 billion transactions a year, nearly 2,000 per second, making it the largest payment card network in the world.⁴

Why Visa?

The critical role that Visa presently plays in facilitating global commerce is certainly one important reason for us to study its origins, but there is another, perhaps more significant, reason as well. Visa, more than any other organization at the time, *defined* the electronically-processed credit and debit cards we know today. Visa's founder and his staff changed the way bankers and consumers thought about the card, transforming it from a vehicle for automating consumer credit to an access device for a global electronic value exchange network.

Although the organization that would eventually be known as Visa was created ostensibly to fix a broken domestic credit card system, we shall see that from the beginning its founder had far larger aspirations. Even before the organization was formed, he had come to the conclusion that money had become nothing more than “guaranteed alphanumeric data,” and that computers and telecommunications would soon enable the near-instant transfer of those monetary data anywhere in the world.⁵ The implications for banking and payments were enormous: any organization that was adept to data processing could easily become a “bank”; and any organization that could facilitate and guarantee transmission of these data would effectively create, and sit at the nexus of, a new global currency.

He also realized that the term “credit card” was a misnomer, a historically-contingent label that limited how people thought about what this kind of card could do. The card, he argued, was simply an access device, something that identified an account holder to a value exchange system. There was no reason why the account in question had to be a line of credit; it could just as easily be a deposit account, an investment account, or any other pool of value the consumer might possess. In fact, there was little reason why the access device needed to be a rectangular plastic card; it could just as easily be something else typically carried by a consumer.

From these insights, Visa's founder articulated a vision for a global electronic value exchange network that set the agenda for the organization's formative years. He surrounded himself with a highly-innovative technical staff, who created some of the first nationwide, and eventually international, computerized authorization and clearing systems. He also used his position to change the way his member bankers

⁴Throughout the period discussed in this book, Visa remained an effectively not-for-profit membership association, but it is worth noting that in 2008, most of the system restructured into a for-profit, publicly-traded corporation. The European region decided to remain a separate membership association and continues to participate in the overall payment system, but in the rest of the world, the core organization now more closely resembles a typical stock-issuing corporation.

⁵Hock (2005), pp. 95–96.

thought about the card, challenging their existing conceptual boundaries by introducing the first wide-scale debit card and the first payment card to access an investment account. Through national advertising, Visa attempted to change the way consumers thought about the card as well, telling them to “think of it as money,” and use the card for routine purchases as well as those that required financing.

In short, what that little rectangular plastic card was “good for” was not something that was immediately obvious to those at the time. Instead, the very meaning and purpose of the card had to be actively constructed, and Visa in particular played perhaps the most significant role in that process.

Purpose of the Book

Despite Visa’s importance to the global economy and our everyday lives, there are surprisingly few examinations of Visa’s early history, and none that adequately deal with the technological infrastructure that underpins the system.⁶ As a historian of technology and former information systems engineer, I found this surprising, as I wanted to understand on a technical level how my own Visa card worked. At the very least, this book should fill this gap, providing a deep and comprehensive history of Visa’s transaction processing systems.

But as an interdisciplinary researcher trained in Science and Technology Studies, I also knew that making a system like Visa “work” requires much more than an array of computers, software programs, and telecommunication networks. Coordinating the work several thousand independent organizations, establishing the proper incentives for participation, and balancing out the participants’ respective interests requires “engineering” of the social relations as well. Both the technological and the social infrastructures are necessary for the system to operate, but neither alone are sufficient to explain how the system works, nor account for its survival, growth, and current success. This book weaves together these two threads to provide the first sociotechnical account of Visa’s history, one that I think will provide a deeper understanding of, as well as new insights into, this system that many of us rely upon everyday.⁷

As a detailed case study, this book also gives us the chance to interact with two grand themes that have been increasingly developed in the history of technology literature. The first is the mutual shaping of technology and social relations, which

⁶For an excellent economic analysis of the payment card industry with some specific history of Visa, see Evans and Schmalensee (2005). For an early financial history of credit cards in general, see Mandell (1990). For an impressive journalistic history of the American post-war financial services industry, with significant sections on Visa, see Nocera (1994). For an autobiography written by Visa’s founder, see Hock (2005). For Visa’s own corporate autobiography see Chutkow (2001).

⁷For the concept of sociotechnical systems history, see Hughes (1983). For a review of this perspective in *Technology and Culture* articles, see Staudenmaier (1985). I will also make use of concepts from the related Actor-Network Theory (ANT) approach, which is described in Callon (1986a), Latour (1987), and more recently, Latour (2005).

examines the ways in which artifacts are often profoundly shaped by social dynamics in addition to technical ones, and how those social relations are then reshaped in return as those artifacts are widely adopted.⁸ The second grand theme concerns the influence that earlier information processing practices often have on the way firms adopt electronic computers and telecommunications.⁹ As we shall see, the Visa case offers a substantial number of examples that help us deepen our understanding of both these themes.

In addition to informing these grand themes, I also develop two new dynamics that I think may be found in the history of other payment systems, or transactional networks in general. The first concerns how participants in a payment system establish trust in new payment devices, and how that trust can overcome the risks endemic to economic exchange. The second concerns how “gateways” in transactional networks can either reinforce or undermine established social boundaries. I will discuss these new dynamics in detail in Chap. 10, and show how they apply not only to the case of Visa, but also more generally.

This book also contributes to a growing body of literature on the history of money, payment systems, and financial services in general. Historians of money have traced the origins of earlier monetary artifacts such as coins, paper money, and written transfer orders (e.g., bills of exchange and modern checks), and a few have begun to include payment cards and their electronic processing systems into their narratives.¹⁰ Historians of business and finance are increasingly studying the adoption of computers and telecommunication by banks and securities trading organizations, as well as the electronic services those systems enabled for consumers such as Automated Teller Machines (ATMs) and Giro payments.¹¹ Economists have done several analyses of credit cards, debit cards, and ATMs.¹² Sociologists have examined the history of consumer credit, credit scoring, as well as the ways in which social networks influence the adoption of new payment systems.¹³ And legal scholars have recently concentrated on the regulatory and legal aspects of the credit card industry, arguing for reforms.¹⁴

In addition to these core contributions, the case study that makes up this book will likely be of interest to scholars in a few other fields as well. Visa’s international

⁸For an introduction to this theme, see MacKenzie and Wajcman (1999). For an overview of the ways in which artifacts are often shaped during their adoption, see Mackay and Gillespie (1992), and Hartmann et al. (2005). For other similar approaches, see Pinch and Bijker (1984), Law (1987), and Callon (1986a).

⁹Yates (2005).

¹⁰Davies (1994), Chown (1994), Einzig (1966), Robertson (2005), and Weatherford (1997).

¹¹For a recent and broad collection of such works, see Bátiz-Lazo et al. (2011). See also Richardson (1970), Humphrey (1995), Fry et al. (1999), Howells and Hine (1993), Kirkman (1987), Frazer (1985), and Wonglimpiyarat (2004).

¹²Evans and Schmalensee (2005), Russell (1975), McLeod (1979), and Hayashi et al. (2003).

¹³For consumer credit, see Calder (1999). For credit scoring, see Poon’s chapter in Bátiz-Lazo et al. (2011), and for social networks, see Guseva (2008).

¹⁴Mann (2006).

cooperative network of competing financial institutions should be a valuable example to those who study organizations and joint-ventures. Visa's rise from a minor player in the payments industry to the world's largest payment card network will no doubt interest business historians. And the international expansion of the Visa system and its role in facilitating global commerce will also be interesting to those who study economic history and globalization.

Finally, this book was also written with an eye toward the generally-curious reader who simply wants a deeper understanding of this system and its history. Academic jargon will be kept to a minimum, and where specific concepts from Science and Technology Studies would be useful, I will explain them briefly so that those without a background in this field can follow the argument.

What This Book is Not

I should also note at this point what this book is not. It is not a critical examination of the evils of consumer credit, or the predatory lending practices of the individual banks—that has been already been accomplished by several authors, and their points are well taken.¹⁵ Instead, this book concentrates on the central organization and its transaction processing system, which, as we shall see, was consciously moved *away* from its historical association with credit and debt, toward an electronic system for the exchange of any kind of value. In fact, I will argue that it would be incorrect to assume that the interests of the central Visa organization and its member banks were always aligned during these formative years; in several cases, including the early debit card, they simply were not.¹⁶

This book is also not a comparative examination of the development of payment card systems in several countries. That would no doubt be interesting and fruitful, but it is nevertheless outside the scope of this book. Instead, this book concentrates on the origins of the Visa organization and its electronic processing systems, which were primarily created and developed in the United States. I do discuss the expansion of the system internationally, and some of the processing challenges this created (such as settling transactions in multiple currencies), but I do not compare the existing national systems in other countries to those in the United States. This book captures Visa's origins in detail so that future work can make an informed comparative study.

Lastly, this book also focused more on the central Visa organization and the motivations its staff than it does on the individual member banks. This is a weakness, but a somewhat unavoidable one at this stage of my research. Even when the original Visa organization formed, there were already hundreds of member banks spread across the country. Although I did interview a few of those who worked in these early member banks, and collected comments others made in the trade press, their

¹⁵For example, see Manning (2000). For a more balanced view, see Mann (2006).

¹⁶See Chaps. 8 and 9.

perspectives are nevertheless relatively underrepresented in this book. I hope to improve this in future publications on this subject.

Sources and Methods

The historical narrative in this book is based upon research I conducted over a six year period, and my sources fall into roughly three categories. The first was news and trade publications from period (1970–1984), which not only provided me with a basic timeline of the events, but also revealed the issues that were most contentious at the time. To gain a mix of perspectives, I consulted not only banking-oriented news sources, but also merchant and consumer-oriented ones as well.¹⁷

The second group of sources included the autobiography of Visa's founder, and interviews I conducted with those who designed, built, and participated in the Visa payment system. Autobiographies and oral histories have obvious dangers that have been discussed at length elsewhere, but they complemented the news sources in a few important ways.¹⁸ First, they helped uncover *why* certain decisions reported in the news accounts were made, what other options were discussed, and what their motivations were at the time. Second, they uncovered new information that was never reported publicly, and many times, never written down at all. Third, they often provided a less-guarded perspective on the events of this period, as all the informants had already retired or no longer worked for Visa. A full list of interviewees is provided after the table of contents.

The third set of sources consisted of a selection of documents from personal collections that were created by some of the key actors near the time of the events. These included reprints of speeches given by Visa's founder and other executives, project reports, statistics, brochures produced for the member banks, consumer survey results, as well as artifacts such as old sample cards. These sources enabled me not only to corroborate statements made by the interviewees, but also to discover new, detailed information that did not appear elsewhere. The speeches were especially useful for validating that the philosophical ideas Visa's founder discusses retrospectively in his autobiography did actually play a significant role in his decision making at the time.

While constructing the narrative, I continually combined information from all three types of sources, cross-checking them against one another, and asking follow-up questions of the informants when necessary. Wherever possible, exact dates, statistics, or factual claims came from printed sources created near the time of the events. Reflections upon the *meaning* of those events came from a mixture of quotes

¹⁷Banking-oriented sources included *The American Banker* newspaper, the *ABA Banking Journal*, *The Nilson Report* and the *Payment Systems Newsletter*. Merchant-oriented publications included *Business Week*, and *Forbes*. Consumer publications included *Life*, *Newsweek* and *Time*.

¹⁸Thompson (2000), Perks and Thomson (1998), Vansina (1965), Smith and Watson (1996, 2001).

from those printed sources, comments made during interviews, and my own analysis. Disagreement between sources was surprisingly infrequent, but when it did occur, I noted the various accounts or opinions and left the question open.

Although the methods discussed in this section should, I hope, lead to a narrative that is as accurate as possible, no method will produce a true and accurate description of the time period “as it really was.” This is widely recognized as a chimera in historiography, and I only claim that what follows is *a* history of the Visa payment system’s origins, not *the* history.¹⁹ Like any history, this history is told from my own perspective, which is highly influenced by my academic training in Science and Technology Studies, and my technical training in information systems and software engineering.

Structure of the Book

The chapters of this book are organized mostly in chronological order, and each builds upon the previous ones. Chapter 1 sets the context for the story, describing the early history of merchant-specific charge cards, travel and entertainment cards, and the first bank-issued credit cards. Chapter 2 then analyzes the national network built around one of these cards in particular, the BankAmericard licensed by Bank of America, pointing out its various operational and organizational problems. I then introduce Visa’s founder and first CEO, Dee Ward Hock, and describe how his philosophical ideas shaped the structure for his new organization, initially known as National BankAmericard Incorporated (NBI).

Chapter 3 then takes a bit of a sociological detour to discuss the role of the operating regulations in a cooperative network like NBI/Visa. Establishing the operating regulations was one of the first steps taken by the new organization, and I liken it to crafting the social dynamics of the system. I argue that these regulations are a key part of what makes the Visa system “work” at the inter-organizational level, and how Visa’s role in adjudicating these rules helps establish just enough trust between the competing participants for the system to function and grow.

Chapters 4 and 5 return to the technological aspects of the system, describing in detail NBI’s first computerized authorization and clearing systems, known mostly by their acronyms BASE I and II. NBI was of course not the only organization building such systems in the early 1970s, and these chapters put their systems in the context of other similar efforts by individual banks, independent processors, and bank service organizations. Chapter 5 also discusses NBI’s first significant technical failure, a program intended to run within the member banks’ processing centers, known as BASE III.

Chapter 6 charts the various ways in which the system was expanded throughout the 1970s, both technically and organizationally. On the organizational side, I discuss the formation of the international version of the organization, antitrust battles

¹⁹For a classic statement of this historiographic point, see Carr (1961). For a recent continuation of this theme, see Gaddis (2002).

and the institution of “duality,” and the name change to “Visa.” On the technical side, I discuss the shift of BASE I to the Airline Control Program (ACP) running on IBM hardware, the creation of a second cooperative data center, the expansion of the electronic authorization network internationally, and multi-currency settlement.

Chapter 7 returns to the technological aspects of authorization, describing how Visa helped fully-automated the point-of-sale. It discusses the various debates surrounding how to make the cards machine readable, and Visa’s role in stimulating the development and widespread adoption of inexpensive merchant dial terminals.

Chapters 8 and 9 examine the ways in which the role of the central organization had to be worked out through a series of power struggles with the member banks. Chapter 8 chronicles the history of Visa’s debit card, first introduced in 1975, but not widely issued until several decades later. This chapter argues that this delay had more to do with the ways in which the debit card clashed with the member banks’ existing electronic funds transfer (EFT) plans, and disputes about Visa’s role in the deposit side of the banks. Chapter 9 continues this theme of role negotiation by discussing other controversial moves by the central organization: the creation of a Visa-branded travelers cheque; the direct signing of the national retail giant JC Penney by Visa USA; and various signs of empire building that eventually resulted in Hock being forced out of the organization.

Chapter 10 concludes the book by summarizing the narrative and its contributions to the grand themes discussed earlier, and offering two new dynamics that I think may apply to the study of other payment systems, or cooperative transactional networks in general.

Electronic Value Exchange

Origins of the VISA Electronic Payment System

Stearns, D.L.

2011, XXVIII, 240 p., Hardcover

ISBN: 978-1-84996-138-7