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# Payment Technologies: Past, Present and Future

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History can be a useful guide to the future, especially when trying to predict the impact of disruptive changes on human organizations and cultures. I was reminded of this dictum when recently attending a very interesting workshop at the University of California, Irvine called *Payment Technologies: Past Present and Future*.

The workshop was sponsored by the Intel Science and Technology Center for Social Computing and hosted by the Institute for Money, Technology and Financial Inclusion (IMTFI). IMTFI was established in 2008 to “support research on money and technology among the world’s poorest people. . . [and] to create a community of practice and inquiry into the everyday uses and meanings of money, as well as the technological infrastructures being developed as carriers of mainstream and alternative currencies worldwide.” It is part of UC Irvine’s School of Social Sciences.

The workshop brought together a mix of people from different disciplines, including anthropology, history, economics, business and technology. The agenda covered a wide variety of subjects, ranging from the methods used to keep track of transactions in ancient Mesopotamia and the pre-Columbian Inca Empire, to the advent of credit cards in the mid-20th century and the future of digital payments in the 21st century.

It was organized by IMTFI director Bill Maurer and USC Annenberg School doctoral candidate Lana Swartz who distributed a short paper laying out the workshop’s objectives:

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*“The end of cash is on the agenda, seemingly everywhere. Constituencies rarely aligned – multinational payments companies, economic development and aid practitioners, nonprofit volunteers and venture capitalists – are coming together around the prospect of the supposedly imminent disappearance of physical currency objects. . .”*

*“Reaching further back in time, however, we also recognize that the era of cash – of tangible, physical objects of paper or metal serving as money – is, relatively speaking, a historical anomaly, especially seen from the point of view of 10,000 years of recorded human civilization. Archaeologists and historians of the ancient Near East have shown that money of account, recorded in transactional records, long pre-dated the minting of coin or other tangible objects used as a universal equivalent for exchange. In the beginning was not the coin, but the receipt. Is cashlessness a return, then, to a world of institutionalized, transactional record-keeping? If so, what questions ought scholars and practitioners be asking, now, about those past and possible future worlds?”*

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In other words, as physical money is being increasingly replaced by its digital representations in cloud-based systems accessible from all kinds of mobile devices, we are in a kind of *back to the future* universe. In fact, one of the papers discussed at the workshop, *Memory, Transaction Records, and The Wealth of Nations*, analyzed the link between extensive transaction records and complex economies, going all the way back to record keeping in Mesopotamian societies thousands of years ago. “Humans first invented writing to keep records, which coincided in time with the emergence of the first cities, underscoring the central importance of transaction records.”

Money and transactional information have been closely intertwined from time immemorial. It is not surprising that the emergence of new technological capabilities like *Big Data* and inexpensive mobile devices go hand-in-hand with the growing importance of digital money and payments. Not only is money increasingly represented by information, but information about money is itself becoming a form of money. Walter Wriston, chairman and CEO of Citibank from 1967 to 1984 – widely regarded as one of the most influential bankers of his generation – famously said: *“Information about money has become almost as important as money itself.”* I think we can now update his remark to read: *Information about money is money.*

This point was well articulated in a recent report by the World Economic Forum called *Personal Data: the Emergence of a New Asset Class*. “As some put it, personal data will be the new *oil* – a valuable resource of the 21st century. It will emerge as a new asset class touching all aspects of society.” Much of that valuable personal data is related to our past, present and future financial transactions one way or another.

I participated in a panel at the workshop. In my introductory remarks, I related the evolution of digital money to a couple of IT innovations from the recent past.

First, achieving a *cashless economy* should be viewed as a metaphor for the digital money revolution, not as a literal end in itself. What really matters is achieving the societal benefits

inherent in the transition to digital, not necessarily getting rid of cash altogether. Let me relate this point to the *paperless office*.

The advent of personal computers in the 1980s ushered a number of office oriented applications, including word processing and document management systems. Since a lot of these efforts involved *going paperless*, that is, dealing with digital documents instead of physical ones, the *paperless office* became synonymous with the office of the future.

As it turned out, the dramatic technology advances of the past 30 years have led to revolutionary changes in just about every aspect of *the office*, including the very nature of work and the workplace. An increasing number of people have home offices and telecommute or conduct a portion of their work from home. But, personal, inexpensive machines that enable us to print, copy, scan and fax paper documents are now found in most workplace and home offices. The *office of the future* is alive and well, but the *paperless office* never really came about.

Second, the digital money revolution will play out in a series of incremental steps. Digital money innovations will become integrated into our everyday life over time, as has been the case with previous payment innovations like credit cards. Let me illustrate this point by briefly discussing the advent of *e-business* in the 1990s.

At the time, a lot was happening around the Internet, but it was not clear where things were heading, and in particular what the implications would be to the world of business. The *dot-com* era was famous for its many innovations, but also for its hype. Part of the buzz in the air was that in the Internet-based *new economy*, *born-on-the-Web* startups had an inherent advantage over existing, *brick-and-mortar* businesses. Because of their grounding in the physical world, it was thought they could not possibly compete in this fast-moving digital space and were therefore headed for extinction.

Today, most everyone will agree that the Internet has had a dramatic impact on every private and public sector institution, as well as on the economy in general. But the digital world has in no way replaced the physical world. Actually, given that digital technologies have been penetrating just every nook and cranny of the economy and of society, the world's digital and physical infrastructures are not only nicely co-existing but coming closer together. The *e-business* revolution that we anticipated back then has come to pass with a vengeance. However, *e-business* is no longer a separate business concept. It has become an integral part of business.

Fundamental innovations in record keeping and payments enabled our transition from small primitive groups to large-scale complex economies and societies. These include cuneiform script and writing in Mesopotamia to better keep track of transactions; and money and other payment instruments to facilitate commerce. Given this history, as we now

transition to a digital money ecosystem that will include just about everyone in the planet, we should fully expect a stream of innovations that we can barely begin to anticipate.

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## DIGITAL MONEY

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