

FROM THE EDITORS

MANAGING DIGITAL MONEY

Editor's note: This editorial is part of a series written by editors and co-authored with a senior executive, thought leader, or scholar from a different field to explore new content areas and grand challenges with the goal of expanding the scope, interestingness, and relevance of the work presented in the Academy of Management Journal. The principle is to use the editorial notes as "stage setters" to open up fresh new areas of inquiry for management research. GG

"Money," as Liza Minnelli and Joel Grey sing in the movie *Cabaret*, "makes the world go around" (Kander & Ebb, 1966). Since gold coins emerged in Turkey more than 2,500 years ago, money as a measure and store of value and a medium of exchange has been crucial for economic and social development. Commerce relies on the ability of strangers to transact over time and distance, and money allows them to do so. The forms of money have changed along with technology. Coins valued on their precious metal content were replaced by symbolic base metal and complemented by intrinsically worthless notes made of paper. As the information technology revolution progressed, and especially since credit cards were introduced in the 1960s, financial dealings have become increasingly virtual (Ferguson, 2012). Cash accounts for only 7% of economic transactions in the United States. Trades, loans, and purchases are increasingly being undertaken digitally, with an estimated 57 billion credit card transactions undertaken in 2012 (Capgemini & The Royal Bank of Scotland, 2013).

A new technology, digital money, has emerged as a medium of exchange and a measure and store of value in electronic form. "Digital money" refers to any means of payment that has cash equivalence but is stored in a purely digital form. It is used in the commercial transactions of goods and services in a highly connected world where trade is increasingly globalized and where the majority of the world's population is becoming urbanized. Digital money has been facilitated by use of technologies such as mobile phones, cloud computing, data analytics, encryption and storage, and near field communication technology. Diffusion of these technol-

ogies is likely to accelerate the virtuality of transactions, and hence their scale and scope (e.g., Brynjolfsson & McAfee, 2014; Chuen, 2015), lubricating frictions in the financial system to make "the world go around" more quickly and extensively.

Digital money *dematerializes* by moving everyday economic transactions—payments, transfers, receipts—from the physical to the digital world. Although its progress will be evolutionary as the technology and its social and economic influences interact, it is potentially a transformational technology. It allows, for example, people to transact without the need for a bank account or a credit card, a significant advantage in some developing countries; it reduces entry costs to provide new opportunities for economic and social entrepreneurship; and it increases social cohesion and government efficiency through improved tax collection and the use of digital remittances. Digital money makes transactions faster, cheaper, and more widespread. It *disintermediates*, connecting people and money more closely. When we use the Internet to shop and pay by credit or debit card, we incur an intermediary cost. When we purchase foreign currency at an airport, we suffer the broad spreads in exchange rates used to profit the intermediary. Non-cash transactions almost always require the services of a bank or financial services company. Digital money can remove the need for many of these intermediaries.

For individuals, digital money offers the potential for easier and cheaper access to finance, but raises the specter of reduced privacy and potential insecurity in financial dealings. For organizations, it offers opportunities for revenue growth in existing and new markets, and reduces the costs of handling cash and offers efficiencies in managing invoices and receipts and reducing auditing costs. However, digital money also brings increased uncertainty and complexity into the business environment, with doubt over the technological choices to be made and lower entry costs inviting new business entrants to disrupt the status quo. For society, it can reduce tax avoidance, aid social payments, reduce the health risks of handling germ-carrying cash, and conceivably bring

billions of previously disenfranchised people into the global financial system, but it poses challenging questions of balancing freedoms and openness with the need for oversight and regulation. It also brings with it risks and concerns about cyber security and electronic crime.

Digital money raises numerous important questions for management scholars. What will its impact be on business growth and competition? Which business strategies and models, technologies and platforms will emerge and be most successful? What opportunities does it offer for entrepreneurship and new models of innovation? What is an appropriate regulatory balance, encouraging private initiative but protecting citizens? How might digital transactions be best accounted and independently audited? And what are its implications for trust between people and organizations and within society when identities are digital and open to fraud? This editorial is not intended to offer a survey of the state and potential of digital money, or provide a comprehensive research agenda. Instead it aims to highlight the significance of digital money as a transformational innovation and the consequences and opportunities for management scholarship.

EXTENT OF USE

Digital money has widespread implications throughout the private and public sector, and for organizations such as charities. It affects the flows of transactions in commercial banking and other financial services. Business-to-business, business-to-government, and bank-to-bank transactions are increasingly conducted digitally. It also profoundly affects the retail and consumer market. Through the development of online shopping with companies such as Amazon and Alibaba and payment platforms such as PayPal, consumers have become comfortable transacting digitally. Many of us have rapidly become accustomed to shop and pay, and do our banking, online.

The locus of many of these economic transactions is moving to our smartphone, with the mobile Internet being the most rapidly expanding area of consumer electronics. According to the GSMA, an association of nearly 800 mobile operators worldwide, the 2.2 billion mobile Internet subscriptions in 2014 will increase to 3.8 billion by 2020 (GSMA, 2014: 12). In more and more places around the world, we can use mobile phones to pay for subway fares, road tolls, and parking, settle restaurant bills,

and purchase from shops and vending machines. In cases such as public services transport, the movement to full digital payment methods reduces the inconvenience of queuing for tickets and significantly reduces costs for operators. Digital money also makes it easier to donate to charities, removing the need for donors to fill out forms and write checks while also reducing administrative costs for the charity. Digital money could be a relevant context to study transaction cost economics, organizational design, and coordination costs.

The range of digital money uses on mobile devices is likely to increase, but not without conflict, contention, and competition. As digital money involves a wide range of institutions—including banks and financial institutions, mobile phone manufacturers and operators, Internet service providers, open source communities, and applications developers—yet involves a few core technical standards, it remains a complex, fragmented, and rapidly evolving ecosystem. As well as the technical issues to be resolved, experiments are occurring with new business models, consideration is being given to a variety of oversights by central banking authorities, and there are major social issues to be resolved around digital security and privacy. In such a fluid and unpredictable context, it is difficult to provide authoritative data on the aggregate extent and impact of digital money. It is possible, however, to discuss a number of its platforms and to assess the extent to which nations are prepared for digital money.

Platforms

The concept of innovation ecosystems helps analysis of digital money's evolution. "Innovation ecosystems" have been defined as a network of interconnected organizations structured around a focal firm or a platform, incorporating both production- and use-side participants, and focusing on the development of new value through innovation (Adner & Kapoor, 2010; Autio & Thomas, 2014). Two examples of such platforms are Apple Pay or Alipay (in China), both payment platforms, and bitcoin, a "cryptocurrency" based around an open source protocol.

The digital money platform Apple Pay was launched in 2014. It embraces a number of industry technical standards, such as near field communications, and means to secure sensitive financial data. To set up its system, Apple has

collaborated with credit card companies, banks, and merchants. Apple Pay will be accepted initially in over 200,000 merchants. The system is based on Apple's iPhone 6s smartphone and Apple Watch smartwatch, so the number of operating connections in the ecosystem is inevitably limited by their sales. Traditionally a "closed" company when it comes to sharing technical information and opening up its platforms for third-party development, Apple is publishing its application programming interface to encourage innovation within its developing ecosystem. Similarly, Alipay, a digital wallet model launched earlier in 2004, presently does more than \$70 billion and 87% of mobile retail transactions annually in China (Chuen, 2015).

Launched in 2009, bitcoin is a peer-to-peer payment system and digital cryptocurrency—that is, a currency not controlled by nations' central banks. It is used by several thousand businesses worldwide. Recognized for its advanced cryptography that facilitates safe and comparatively inexpensive transactions, it remains controversial for reasons of its volatility in exchange rates, absence of oversight in areas such as taxation and consumer protection, and the opportunities it provides for money laundering (e.g., Chuen, 2015). The system also has the disadvantage of irreversibility: once a transaction occurs, there is no recourse if a mistake has been made. Inevitably, given the high degree of uncertainty surrounding its path of development, opinions are starkly polarized as to its future. Many consider the protocols and algorithms underpinning bitcoin, and currencies like it, to be high potential (Ali, Barrdear, Clews, & Southgate, 2014), but question the eventual efficacy of its currency element. There are, however, estimated to be several hundred cryptocurrencies, and some anecdotal evidence of bitcoin's popularity in, for example, remitting the pay of foreign guest workers back to their homes without incurring significant exchange rate losses. With the average cost of processing a payday check at 4–5% of its value, the opportunity for removing such costs through cryptocurrencies reveals their potential future attraction.

Digital Readiness

Citi and Imperial College London have developed a digital money readiness index (Dave, Shirvaikar, Baxter, Smilowicz, Thomas, & Vernet, 2014), using publicly available data from 90 coun-

tries around the world.¹ By examining the institutional environment, enabling infrastructure, solution provisioning, and propensity to adopt, the index defined four major readiness groups: *incipient* (30 countries), *emerging* (20 countries), *in transition* (20 countries), and *materially ready* (20 countries). The latter countries have supportive factors in place, such as effective regulatory environments, but have yet to fully develop digital money systems with universal access.² The incentives for countries to move up the readiness index are discussed in a report funded by, among others, the World Bank and the Bill & Melinda Gates Foundation, and which argues that "broader access to and participation in the financial system can reduce income inequality, accelerate consumption, increase investments in human capital, and directly help poor people manage risk and absorb financial shocks" (Klapper & Singer, 2014: ii).

To illustrate the significance of digital readiness, the Citi/Imperial College study estimated that a 10% increase in digital readiness score and commensurate increase in adoption could translate to \$1 trillion moving from the informal to the formal economy, with an associated increase of around \$100 billion in increased tax revenues (Dave et al., 2014: 8). The 10% increase would bring an additional 220 million people into the formal financial sector, increasing deposits by \$80–100 billion and loans by \$70–90 billion.

INNOVATION AND ENTREPRENEURSHIP

One of the most powerful consequences of the convergence of today's digital technology is that it provides a universal platform for innovation, which, in turn, offers rich research prospects for management scholars in the areas of innovation and entrepreneurship. This applies across all financial markets, from commercial banking and financial services to new retail services assisting consumers. There are opportunities, for example, to study the diffusion of a significant disruptive global technology, the emergence of "dominant designs" and platforms, the management of risk, the

¹ http://icg.citi.com/icg/sa/digital_symposium/docs/DigitalMoneyIndex30012014.pdf (accessed February 20, 2015).

² MasterCard has produced another digital readiness index, showing similar diversity in national preparedness: <http://mobilereadiness.mastercard.com/the-index/> (accessed February 20, 2015).

development of technical standards, and patterns of collaboration in R&D and marketing. There is growing research interest in studying the emergence and dynamics of business and innovation ecosystems and the strategic positioning of competitive advantage within them, and digital money provides an opportunity to study this based on different and competing platforms.

In contrast with product innovation, with its focus on natural and engineered physical objects and systems, digital money, like all services innovation, is characterized by a focus on organizational systems made up of people, information, and processes. This dematerialization emphasizes even more the importance of understanding the nature and patterns of consumption. Product innovation is commonly associated with investments in R&D to create new options, prototyping and testing in new product development processes to improve functionality, and manufacturing at scale in automated factories to reduce costs. In contrast, intangible service innovations such as digital money are less front-end loaded and more focused on their creation at the point of consumption. The objective is delivery of positive consumer experiences, collaboratively developed but often personalized in nature—for example, in the construction of idiosyncratic financial services for individual insurance and investment requirements. The individualized and immediate experiences that consumers demand of digital services in companies such as Google, Amazon, and Netflix apply to digital money: there are new demands on how transactions are expected to occur.

Digital money provides opportunities for more “inclusive” innovation. Unlike the business models of large corporations addressing the “bottom of the pyramid,” inclusive innovation allows poor people and societies facing problems to develop their own solutions. Using the digital infrastructure, “bottom-up” ideas can emerge from local entrepreneurship (George, McGahan, & Prabhu, 2012). A Nigerian agrichemical company, Notore, for example, is using a digital money platform to de-risk its supply chain through just-in-time delivery of orders from farmers using mobile phones, reducing costly inventory for distributors and retailers. In an interview with one of the authors, a bank manager from Sampath Bank in Sri Lanka observed that, when he joined the bank 30 years ago, customers used to arrive at the bank’s opening at 09:00 a.m. with their packed lunches, knowing their transactions could take all day. He talked

proudly of how, today, by using mobile phones, construction workers could instantaneously remit their pay to relatives without bank accounts. A simple code number sent by SMS allowed relatives to collect cash from ATM machines.

Although not uncontroversial, the effect of microfinancing very small loans to impoverished people and villages, provided by organizations such as the Nobel Peace Prize-winning Grameen Bank, is well known (Yunus, 2003). Many of the rural poor are disenfranchised through having no official record of their existence, such as birth certificates or electoral rolls, preventing them from opening bank accounts and taking out loans. Possession of a mobile phone with a digital identity provides access to digital money and the opportunity for billions of people to join the formal economy for the first time (Dodgson, Gann, Wladawsky-Berger, & George, 2013). Loans and remittances can be made directly to individuals, avoiding usurious loan sharks and circumventing corrupt local officials. The issue of identity is part of the highly germane question for management scholars of trust.

TRUST

When we use a credit card, we trust our bank or financial services company to make the required transaction from our account, and the vendor trusts that the correct amount will be transferred into their account. Trust is based on the understanding that all parties involved in a transaction will behave in a mutually acceptable manner (Sako, 1992). There are issues of trust and trustworthiness in peer-to-peer lending decisions (e.g., Sonenshein, Herzenstein, & Dholakia, 2011). In financial transactions, interpersonal trust is often substituted by trust in the institutions that intermediate those transactions. Absent such institutions from digital transactions, then questions of trust are heightened. Cyber crime is already significant, and everyone online has, at one stage or another, been exposed to the appropriately offensive-sounding hacking, phishing, viruses, and worms. According to a 2012 survey of more than 8,000 people by the U.K. Office of National Statistics (ONS), 3% had lost money while using the Internet (ONS, 2012; in McGuire & Dowling, 2013a: 6), while other surveys have found that 5% and 6% of people had suffered financial loss through using credit or debit cards online (Ipsos MORI, 2013; in McGuire & Dowling, 2013a: 27). In an ONS survey of more than 42,000 people, 56% reported receiving one or more potentially fraud-

related communication(s); 16% were offered the chance to make an investment with a guaranteed high return; and 15% were offered a loan on “attractive” terms (ONS, 2012; in McGuire & Dowling, 2013b: 9). An advantage of digital money transactions is they can have an identifier that makes it possible to trace how money flows. This can be beneficial, as, for example, it is possible to quickly recognize fraudulent transactions, and even, through early pattern recognition, prevent them from occurring. But it can also invade privacy, and this accentuates the need for ethical behavior of the service providers.

The potential for fraud without the intermediation of well-established and well-regulated institutions requires new forms of trust to emerge between people who do not know one another. It is possible to imagine the use of social reputation systems emerging, similar to those denoting a vendor’s trading history on eBay or user’s online reputation on Airbnb. The approach to trust developed in cryptocurrencies, such as bitcoin, lies in what computer scientists call “distributed authenticity” and bankers call “distributed ledgers.” Essentially, trust lies in the network of what is called the “block chain” of all previous transactions, with permissions and authenticity checked by those within the community of users. The relative social and technological contribution to the construction of trust, and its implications for new forms and models of governance (Tihanyi, Graffin, & George, 2014), makes digital money a context rich for inquiry for strategy scholars.

NEW BUSINESS MODELS

Three elements help underpin business model innovations associated with digital money: (1) pursuit of efficiency gains by reducing the friction caused in traditional financial transactions, (2) new ways of engaging with customers, and (3) the creation of new businesses based on data gleaned from transaction behaviour (George, Haas, & Pentland, 2014). Improvements in operational efficiency are a key driver for changes in business models in established firms. The novelty is to expose the costs of traditional forms of transaction and accounting that can be reduced or eliminated through the introduction of digital money. Examples range from different forms of e-commerce to reducing the costs of administering public sector services using online or mobile payment systems.

New business models associated with novel ways of engaging with customers can be seen in

consumer markets where ease of digital payments is aided by the melding of different social network platforms. Finding a hotel room on TripAdvisor or Facebook can take you directly to a booking and payment site, with pre-registered details preventing the need for their repetition. Business-to-business examples include provision of supplier finance schemes that can be used to assist smaller businesses manage cash flows and overheads associated with transaction costs. Examples are found in many sectors, from “shared value” schemes operated by large food manufacturers to subcontractor payment schemes in construction. These business models tend to exhibit ease-of-use benefits for fast and smooth experiences for consumers and businesses.

Business model innovation is generated by the creation of new data about purchasing patterns, transactions, and the flow of money. This can reveal previously unavailable, fine-grained information that can be used to develop new types of services for customers in different market segments. Major global banks, for example, seek to innovate in transacting digital financial flows across a hugely diverse range of retail, business, and government customers. The extent of the opportunity is seen in the case of Citi, where these transactions amount to \$3 trillion a day. This provides an incredibly data-rich environment for innovation in which analysis and modeling of digital transactions and flows is an essential requirement for the development of new services. One example is the use of data analytics and visualization to understand the flows of digital money in what have become virtual business environments such that third-party audits can be carried out to the same exacting standards as with traditional payment systems. To illustrate the diversity of opportunity, and by way of contrast, another example is the provision of payment cards for sailors in the international merchant navy reducing the need for ships to carry large volumes of cash in different currencies to meet the wage bill.

BUSINESS COMPETITIVENESS AND GROWTH

The development of digital money is characterized by competition between different sectoral interests and technologies. Management scholars have opportunities to explore and explain the benefits of being an incumbent or entrant; first-mover advantage versus being a fast follower, and the possibilities of open or proprietary approaches to intellectual property. These questions arise in a

diversity of business contexts, ranging, on the one hand, from well-established multinational companies for which supply chains provide traditional retailing operations in all the major markets of the world to new “micronationals,” such as entirely digitally operated peer-to-peer services. Questions arise in all sectors about how industry leadership in the area is eroded as more of the economy transacts digitally and digital money becomes the norm.

Other implications for competitiveness include the ways in which businesses manage cash flow, overheads, and their reporting and audit requirements. These are especially burdensome for small businesses, and digitalization can significantly assist the efficiency of their managerial and financial accounting and with compliance requirements. Digital money and the virtualization of consumer purchasing patterns and business transactions will also create new opportunities to study rates of turnover of capital, as well as the role of savings and interest, foreign exchange, and treasury functions. The reduction in the cost of handling cash is already estimated to be in the order of \$55 billion per year in the United States. The competitiveness of international business transactions will also be affected. As the digital money readiness indexes suggest (e.g., Dave et al., 2014), those countries and firms that have capabilities to transact virtually, with less friction, are likely to gain a competitive advantage.

The implications for business competitiveness and the growth of the speed and ease of digital transactions therefore raise numerous research questions about investments in new technologies and value creation and capture (e.g., Kapoor & Lee, 2013). Businesses continually search for new value-creating opportunities, and digital money provides a high-potential new source, albeit one that is still in its early stages and high risk. There is much to learn about who manages to appropriate benefit from digital money and why. The growth of organizations developing digital money businesses provides opportunities for the examination of key theoretical constructs in strategy, from industrial organization, institutional theory, transaction cost economics, and game theory to the resource-based view and dynamic capabilities theory. It raises questions about organizations' capacity to adapt to disruption, involving their absorptive capacity and learning ability. Answers to these questions in such evolving and uncertain environments are likely to emerge from a combination of scholarly research engaged with empirical examples from practice.

CONCLUSION

Money lubricates economic activity. It is also a deeply sensitive social and cultural issue for society, organizations, and individuals. Changes in the way money is created and used cannot be separated from its economic, technological, social, political, cultural, historical, religious, and ethical contexts. Digital money is in its early stages of development, and these complex and interrelated contextual factors will influence its future direction and adoption, adding to the unpredictability of its trajectory of adoption and influence. Nonetheless, a combination of globalization, urbanization, and digitalization has seen an irreversible shift in the way money flows in economic systems. These changes appear to be reshaping traditional financial markets, such as consumer or retail banking and commercial banking, and financial services such as foreign exchange. They invite a significant management research agenda, and, while there is still much to be discovered, it is possible to speculate on some of the factors that will affect its progress.

Just as digital technology has not produced the paperless office, digital money is unlikely to completely replace existing forms of money. Many businesses and consumers work and live in a dual world of physical and virtual interaction and transaction. There will be competition but coexistence between existing and new institutions, business strategies and models, platforms and technologies, and the study of the dynamics in those relationships offer rich research potential. There will be a diversity of approaches, with no single formulas for success. As transactions dematerialize and disintermediate, the question arises of whom leads and takes responsibility in this new world. It is possible to speculate that competitive advantage in digital money ecosystems will depend on the judicious balancing of proprietary positions and openness. Partnerships will be a core competitive tool, with issues of partner selection and relationships to the fore. The digital money ecosystem will require new talent in management, science, and technology, and, as with most emerging innovations, it is likely that the organizations that employ multidisciplinary staff, are market facing in orientation, and operate with a collaborative and open approach are likely to be favored. There will be an enormous challenge for regulators, and the most effective of them will be proactive to protect societal interests while encouraging entrepreneurship and experimentation. If privacy can be protected, the

data that surrounds digital money provides insights that allow governments to be much more effective in delivering services to citizens. These are all potentially important topics of study for scholars as the managerial and technological worlds change around us.

The future is there to be created, but some things are already clear. Banks and financial institutions will develop strategies to respond to the opportunities and threats of digital money. New entrants will attempt to disrupt those strategies. Some will see digital money as a means of pursuing libertarian agendas, others as an alternative to the capitalism of large corporations. Governments will continue to try to develop effective regulations that preempt rather than respond to financial challenges. Consumers will seek improved convenience and experiences in transactions and reduced costs. These considerations raise questions on institutional readiness and adaptability—how do institutions change with fundamental changes in technology and individual behavior? Digital readiness will continue to emerge as a key element of national competitiveness. Mark Twain observed that the lack of money is the root of all evil; the transformational effects of digital money will be relatively most influential in poorer nations. The great possibilities of digital money for developing economies, as described above by the Bill & Melinda Gates Foundation and the World Bank, are distinct realities. While digital money will not remove poverty and inequality, it will provide a vital new tool in helping them to be addressed. Further to the *Academy of Management Journal's* calls to rethink management scholarship by picking grand challenges or globally significant phenomena (George, 2014), digital money provides one such important trend that shapes the context of management. With such broad implications for individuals, organizations, and society, it warrants extensive research engagement from management scholars.

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