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DPS 2.0: on the road to a cashless society

Nwamaka A. Anaza
Southern Illinois University Carbondale

Delancy H.S. Bennett
Howard University

Yana Andonova
Murray State University, yandonova@murraystate.edu

Emeka Anaza
James Madison University

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DPS 2.0: On the road to a cashless society.

Abstract

While cash will eventually become a thing of the past, marketing researchers have given little attention to the rise of cashless markets and the obstacles and opportunities they present. In fact, research that addresses the strategic approach to planning, coordinating, and executing the cashless adoption and experience for consumers is scant. To stimulate discussion and scholarly investigations into marketing's contribution towards the evolution of cashless economies, this Idea Corner presents a research agenda that delineates the role of DPS 2.0, a new era of digital payment systems, in fueling the demonetization process. We offer that, compared to traditional payment systems (DPS 1.0), DPS 2.0 provides consumers and merchants cashless, virtual, automated, flexible, faster, and interoperable¹ means of payment. However, the promise of DPS 2.0 is clouded with concerns of opportunism, security, and fraud. This paper outlines these issues and provides corresponding future research opportunities within five areas of DPS 2.0 (digital wallets, cryptocurrency, virtual currency, facial recognition, and mobile payments).

Keywords: cashless, digital payment systems, DPS 2.0

Dr. Nwamaka A. Anaza
(PhD Purdue University)
Associate Professor of Marketing
Southern Illinois University Carbondale
Rehn Hall Rm 229, 1025 Lincoln Drive,
Carbondale IL, 62901
(p) 618-453-4341
nanaza@siu.edu

Dr. Delancy H.S. Bennett
(PhD University of Massachusetts Amherst)
Assistant Professor of Marketing
Howard University
2400 Sixth St NW,
Washington, DC 20059
delancy.bennett@howard.edu

Dr. Yana Andonova*
(PhD University of Massachusetts Amherst)
Assistant Professor of Marketing
Murray State University
Arthur J. Bauernfeind College of Business
413B Business Building
Murray, Kentucky 42071
(p) 270-809-4766
yandonova@murraystate.edu

¹ The ability of DPS 2.0 systems to be compatible and operable across providers, software, and payment portals.

Dr. Emeka Anaza
(PhD University of Illinois at Urbana-Champaign)
Associate Professor,
James Madison University
Hart School of Hospitality, Sport, and Recreation Management
Godwin Hall 369
(p) 540-568-5038
anazaea@jmu.edu

*Corresponding author

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1. Introduction

Cashless payment methods like credit cards, known as digital payment systems (DPS 1.0), have facilitated consumer-to-business exchanges since the 1970's. However, a new era of digital payment systems, which we refer to as DPS 2.0, has increased the ease of business-to-consumer and consumer-to-consumer transactions. Continued widespread use of these systems promises to move countries towards being cashless. Yet, marketing academics have given little attention to consumers' migration to DPS 2.0. Certainly, research on the demonetization movement is not new. Nevertheless, this research has focused on the economic monetary policy, financial, and digital transition to a cashless society, rather than on the strategic approach to planning, coordinating, and executing the cashless adoption and experience for consumers. Therefore, an essential question is: What impact will DPS 2.0 have on consumers and firms? The purpose of this paper is to stimulate research on DPS 2.0 concerning marketing's impact on the progress towards a cashless economy.

Unlike the original DPS 1.0 system, DPS 2.0 enables cashless, virtual, automated, faster, flexible, and interoperable transactions aided by Web 2.0/Web 3.0, machine technology (e.g., POS, AI), mobile devices, and computer-based systems/databases (e.g., blockchain) to facilitate monetary transfers between multiple entities. These transactions may not require direct human involvement and allow for transactions that previously could not be conducted without a bank. In fact, several pioneers within DPS 2.0 have been startups and established FinTech companies outside the traditional financial industry.

DPS 2.0 is feeding consumers' desertion of cash, checks, and debit cards for easier and faster payments, and has positioned a migration toward cashless economies. According to Khiaonarong and Humphrey's (2019) study, the average nation's share of cash transactions will decrease from 29% to only 17% by 2026. In fact, China, Finland, and Sweden are rapidly becoming cashless. Currently, three-fourths of Chinese consumers (the world's largest consumer base) prefer DPS 2.0 methods over cash and Finland plans to be cashless by 2023 (Morris, 2019). Supported by financial technologies, DPS 2.0 has also led to the decline of bank cards (DPS 1.0). In fact, debit

cards are down from 66% in 2016 to 49% in 2020, with only 40% of 18-34-year-olds owning a debit card (The North American Payments Insights, 2020).

The COVID-19 pandemic increased adoption of DPS 2.0 services as it fostered contactless avenues such as using digital wallets to send money to friends (e.g., Zelle); purchase from firms (e.g., Apple wallet); leveraging virtual cards for secure purchases (i.e., Eno by Capital One); transferring funds globally via cryptocurrency (e.g., Bitcoin); engaging in transactions in virtual worlds (e.g., the Sim' Simolinas currency); and using facial recognition to make purchases. Additionally, rigorous security efforts such as symmetric encryption and blockchain technology make DPS 2.0 payment methods more secure than cash or traditional credit cards. Most importantly, DPS 2.0 promotes financial inclusion amongst some unbanked and underbanked populations.

Several firms have begun to accept DPS 2.0 as the new normal. However, a keyword search for DPS 2.0 (digital payment systems) and cashless economies among the top 50 marketing journals listed within SJR (i.e., *Journal of Marketing*, *Journal of Consumer Research*, *Journal of Marketing Research*, and *Marketing Letters*) yielded three marketing papers on the topic in the last 10 years. As such, an understanding of how DPS 2.0 will impact consumers' movement into a cashless economy is an important dialogue to pursue.

2. Research Agenda

DPS 2.0 will revolutionize the commercial exchange process, which remains one of the fundamental premises of marketing, while still moving societies into the cashless future. Given the diversity of DPS 2.0², we synthesize them into five categories (digital wallets, cryptocurrency, virtual currency, facial recognition, and mobile payments) and present research questions for each in Table 1.

2.1 Digital Wallets

Digital wallets are electronic or mobile services that store consumers' financial information for payments and transfers between/among personal and non-personal accounts. They offer greater flexibility so that shoppers are not confined to bank cards and cash at the point of purchase. For example, Alipay allows users to transfer money to other consumers' Alipay accounts or bank cards internationally. Digital wallets' ability to facilitate global transactions without the need for foreign currency exchange rates or bank fees may facilitate consumers' willingness to access global markets at a rate greater than that of traditional DPS 1.0. Digital wallets are also more secure than traditional cards. For example, the tokenization technology used by Samsung Pay switches personal card data with a randomized number so that users' personal data is never revealed. In fact, if the token is hacked, it immediately becomes invalid. Consumer adoption of digital wallets remains low (22% globally)³ due to the few existing providers (e.g., Venmo, PayPal, Walmart, Amazon, Apple, Google, etc.). This presents both opportunities (e.g., market simplification) and challenges (e.g., limited suppliers, price fixing) for consumers.

² Contactless payments and virtual credit cards are DPS 2.0 not discussed.

³ Source: Cision PR Newswire (<https://www.prnewswire.com/news-releases/mobile-wallet-adoption-rate-to-increase-to-75-percent-by-2025-says-beroe-inc-301275881.html>)

2.2 Cryptocurrency

Cryptocurrency is a digital currency expected to replace government-issued-tender due to its use internationally without exchange fluctuations, costs, or delays, with its decentralized storage of data, blockchain offers greater security to cryptocurrencies than any other technology currently used by banks and Fintech companies (Gleim and Stevens, 2021). While independence from government is one of its assets, it may also be its chief liability. Cryptocurrencies are typically not insured by governments or valued based on a country's central bank's interest rate. Instead, its value is based on consumer demand. Further, consumers view cryptocurrency as an investment rather than currency to spend. Moreover, to date several firms (i.e., Tesla, Dell, and Expedia) have stopped accepting cryptocurrency. The keys for long term success then may lie in consumers actually spending the currency, wider retailer acceptance (akin to credit cards), approval by federal governments, and having its value tied to investments in less volatile markets (i.e. medical records, textile, or energy). In March 2022, President Biden signed an executive order asking federal agencies to research cryptocurrencies in order to ascertain the perils and determine the potential benefits of cryptocurrencies (The White House, 2022).

2.3 Virtual Currency

Virtual currency is a digital currency used only within the virtual community that issues it (i.e., simbucks in the Sims virtual world). Vendors offer consumers price breaks for purchasing higher volumes of currency. Consumers can also earn currency by performing tasks (i.e., watching an ad or playing a game). This combination of purchased, earned, and won virtual currency may change consumers' value perceptions and increase their willingness to spend it more freely.

As social media sites are starting to offer services that rely on subscriptions rather than selling data to third parties, companies may move towards a virtual currency model. As social commerce grows, the use of virtual currency would facilitate these transactions. Additionally, social networks can allow consumers to earn virtual currency by performing tasks similar to online gaming platforms.

2.4 Facial Recognition

Akin to retinal scanning or fingerprinting, facial recognition uses unique biometrics to determine a consumer's identity. The use of facial recognition systems is fast moving consumers towards a cashless society. For example, with Alipay's Smile-to-Pay, consumers pose at the point of a purchase kiosk, which uses facial recognition to access their bank accounts or digital wallets. Consumers then smile to complete the transaction. These transactions are quick and touchless, and the "currency" cannot be lost nor is it stored on a device that can be misplaced or powered down. Research suggests that consumers perceive facial recognition as a more secure form of payment for in-store (vs. online) transactions (Moriuchi, 2021). Still, consumers remain concerned about their privacy and security.

2.5 Mobile Payments

From the food truck vendor to a local gym owner, mobile payment devices have connected local businesses to a wider market with the presence of a mobile device. From mobile peer-to-peer services (e.g., CashApp, Venmo, Zelle, & PayPal) to SMS payments, mobile payment solutions can dominate global DPS 2.0 usage given the exponential adoption of mobile and smart devices. Anyone with a mobile phone can complete transactions with an affordable and sophisticated POS system. Such tools will not only aid startups scale up their business, but also reduce the number of startups that fail within their first two years. Apple is developing capabilities so that payments can be accepted directly on iPhone devices via pre-existing hardware, thus increasing mobile payment options. Currently, mobile payments are interoperable with Android, iOS mobile phones/tablets⁴, but not on wearable technologies, which present greater opportunities for growth.

3. The Dark Side of DPS 2.0 and a Cashless Society

The advent of DPS 2.0 has contributed to a spend now and pay later mindset, furthering the creation of a debt-heavy consumer culture. The introduction of a strictly cashless society may increase this mindset especially with the proliferation of credit alternatives such as Klarna and Afterpay that make it possible to get any products cash-free and interest-free. The cashless movement has equally raised concerns for the poor and homeless seeking cash assistance. The argument that different forms of DPS 2.0 have provided groundbreaking remedies to handle poverty and homelessness through fundraising sites such as GoFundMe has failed to address the need for cash handouts by the less fortunate. Alongside these concerns, DPS 2.0 has made consumers, their digital purchase footprint, and data more accessible.

Like most new markets, DPS 2.0 is fraught with opportunism. In several instances this includes scam artists taking advantage of consumers' trust in the new technology and unfamiliarity. For example, digital wallet and mobile payment scammers pose as retail or mobile payment vendors requesting consumers' passwords in order to transfer a prize, verify a transaction, or offer a refund. Facial recognition scammers have moved from using masks and pictures to creating synthetic identities (fake identities and living faces tied to fraudulent or stolen accounts). Without trust marks, which indicates that DPS 2.0 can be secured, consumer security and privacy concerns will persist.

Opportunists have also sought to take advantage of consumers' desire to gain wealth with cryptocurrencies. With little oversight, the number of cryptocurrencies has mushroomed to over 10,000 different cryptocurrencies to date. As such, one Bank of America's analyst called cryptocurrency the "mother of all bubbles" (Helms, 2021). Still stories of instant millionaires have created a consumer base that approach cryptocurrency as a get-rich-quick opportunity rather than a long-term financial investment.

4. Conclusion

Literature outlining marketing's role on demonization has been extremely scant, particularly as it relates to consumer adoption of DPS 2.0. With this Idea Corner, we identify five key DPS 2.0 offerings (digital wallets, cryptocurrency, virtual currency, facial recognition, and mobile

⁴ Mobile payment systems are also operable with the hardware provided by the company.

payments) and conceptualize key attributes they all share in that they promote cashless, virtual, automated, faster, flexible, and interoperable transactions. Unique characteristics distinguishing these offerings are further identified such as the decentralization of data associated with blockchain technology for cryptocurrencies, the use of tokenization with digital wallets, and the application of biometric properties associated with facial recognition technologies. Based on these factors, important research questions were identified in Table 1. In sum, while we recognize the concerns associated with DPS 2.0, we believe that the opportunities these offerings present outweigh the costs.

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Table 1: Summary of DPS 2.0 Projections and Research Questions

DPS 2.0 Area of Study (Global Market Size Projection)	Research Questions (Consumers)	Research Questions (Managers)
<p>Digital Wallets (\$3.5T by 2023 and \$7,580.1B by 2027)</p>	<p>What evaluative criteria do consumers use when deciding which digital wallet to select given the limited available options on the marketplace? Will consumers respond more favorably to DPS 2.0 conceptualization factors (automated, flexible, faster, interoperable, and anonymous), marketing related factors (fees, brand name, and company affiliates) or planned behavioral factors (attitude, subjective norms)?</p> <p>What are the barriers in the adoption of digital wallets (i.e., lack of awareness, financial anxiety, demographic factors, impulsiveness)? Can rational messaging about digital wallets diminish the impact of these barriers on future adoption of digital wallets?</p> <p>Given the digital nature of digital wallets, what key factors would motivate consumer adoption (i.e., anonymity, social influence, perceived risk) of digital wallets in brick-and-mortar retail locations?</p> <p>Research on digital marketing has identified that trust marks decrease consumers concerns. As such, what effects would trust marks have an on digital wallets usage in online stores? Will it increase trust, usability, and consumer confidence? What other</p>	<p>What m-commerce strategic factors (i.e., ubiquity, privacy control, integrity, familiarity with corporate brand, and facilitating conditions) can digital wallet providers use to increase consumer trust? Which of these trust-based antecedents will be most important in predicting digital wallet adoption?</p> <p>How can brand differentiation be achieved by digital wallet providers? Will price, brand name, point-of-purchase experiences, and rewards increase brand differentiation for digital wallet providers? Which of these factors are more important to consumers?</p> <p>What are the best strategies to increase non-users' conversion to digital wallets?</p> <p>Retailers (i.e. Macy's, American Airlines) offer credit cards that include consumer rewards and experiences. How do digital wallets, which offers consumers more security compete with retailers' cards that offer rewards? Will consumers choose the rewards of traditional cards over the safety of digital wallets?</p>

	<p>factors can increase consumer trust of digital wallets?</p> <p>Why do cash users prefer cash over digital wallets?</p>	
<p>Cryptocurrency (\$4.94B by 2030)</p>	<p>With over 10,000 cryptocurrencies and more forthcoming, how are consumers evaluating different crypto alternatives based on financial risk, returns, market volatility, and market shocks?</p> <p>How will consumer adoption of cryptocurrencies change given the impending regulatory and legislative oversight in the US? Will governmental regulations attract new consumers or will it lead to consumer abandonment?</p> <p>Marketers within the cryptocurrency landscape are increasingly using celebrity endorsements (i.e., LeBron James and Matt Damon) and sports sponsorships (i.e. Crypto.com arena) to leverage their marketing messages. What effect will these associations have on consumers' trust and acceptance of cryptocurrency?</p>	<p>How can FinTech companies increase merchants' (i.e., B2B and B2C) confidence in cryptocurrencies so that they can be accepted as forms of payments? What steps would encourage more sellers to accept cryptocurrencies? How will these steps vary in B2B vs. B2C transactions?</p> <p>What can marketers do to improve consumers' familiarity and knowledge associated with cryptocurrencies? How does familiarity lead to adoption, investment, and use? Will knowledge strengthen the impact of familiarity on adoption and investment decisions?</p>
<p>Virtual Currency (Not available)</p>	<p>What are the behavioral outcomes of virtual currency losses due to theft in virtual communities? Will consumers share negative word-of-mouth, seek retribution and revenge, or abandon the virtual community?</p>	<p>Since virtual currencies have proven viable in online gaming communities, what consumer characteristics (i.e., age, income, gender, etc.) would lead to virtual currency acceptance in social media communities?</p>

	<p>Since virtual currency can be earned, won, or bought, what type of currency (earned, won or bought) are consumers more willing to spend in virtual communities? Will consumer's spending behavior vary based on the type of virtual community (i.e. gaming vs. social communities)?</p>	<p>How can retailers (i.e., fast food restaurants, clothing stores, sporting event providers) partner with virtual communities so that virtual currencies (e.g., cobranding, sponsorships) can be spent on the purchase of actual goods and services?</p>
<p>Facial Recognition (\$9.25B by 2028)</p>	<p>Does the convenience associated with facial recognition offset privacy concerns with using the technology? What factors alleviate consumer security concerns when facial recognition portals are used as a form of payment for online purchases?</p> <p>What factors lead to consumers' adoption of facial recognition payments (i.e., convenience, ease of use, privacy, risk)? Does the retail channel (online vs. brick and mortar) moderate the impact of these factors on consumers adoption for facial recognition payments?</p> <p>In some cases (i.e. emergency medical care) facial recognition could quickly provide vital information (i.e. identity, insurance information, medical history) while in others it may seem intrusive or add to embarrassment (i.e. purchasing prescriptions or romance related products). In what instances will consumers be least likely to want to use facial recognition and what factors (i.e., embarrassment, money, time) moderate consumer willingness to use facial recognition?</p>	<p>What type of advertising message appeals (i.e., emotional, rational, etc.) can facial recognition firms employ to assure consumers of the anonymity and security of their data?</p> <p>How can retail stores transition to facial recognition portals at in-store point-of-purchases? How will retail stores facilitate a human connection when transitioning to facial recognition portals? How will retail stores encourage the use of facial recognition portals?</p>

<p>Mobile Payments (\$12.06T by 2027)</p>	<p>What are the predictors and outcomes of consumer complaint behavior when using mobile payment systems in retail stores? What factors mitigate consumer complaint behavior in retail stores? Do demographic factors moderate the impact of consumer complaint behavior on consumer decision to patronage the retail store?</p> <p>What consumer-based factors (e.g., personality traits, trust in the provider) will trigger switching behavior across mobile payment systems (i.e. Square, Apple)?</p> <p>How can companies increase the overall customer experience with mobile payments system? Can the quality, pricing, promotional and social aspects of the mobile payment system increase overall consumer experience?</p>	<p>What interoperability adjustments do companies have to make for mobile payments to become optimized for wearable devices (i.e., smart watch)?</p> <p>What touchpoints of using a mobile payment system need improvement? Is perceived flexibility of a mobile payment system an important factor leading to switching to a different provider?</p> <p>What are the most important factors leading to the adoption of mobile payment systems by small business owners (i.e., gym owner)? Are cost-saving metrics (e.g., transaction fees, software costs) more impactful than benefit-yielding metrics (e.g., ease-of-use, fast-to-use, etc.)?</p> <p>What other services (payroll, accounting, ordering, shipping,) can mobile payment vendors offer small businesses to succeed? Can these offerings provide a point of differentiation and competitive advantage? Can these offerings be personalized to provide an added layer of differentiation?</p>
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