Enhancing the Retailer Gift Card via Blockchain:
Trusted Resale and More

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ABSTRACT

Though the retailer gift card has been an ultra-practical marketing tactic to attract customers to spend more, it, on the contrary, also places a great number of customers in troublesome situations due to its current limitations. First, dealing with unwanted gift cards is often time-consuming, costly, or even risky due to the frequent occurrences of gift card resale frauds. Worse still, the issuance and redemption of gift cards happen inside the retailer as in a "black-box," indicating that a compromised retailer can cheat customers (or even third-party auditors) to deny the issuances of some unredeemed gift cards. This paper proposes a practical middle-layer solution based on blockchain to address the fundamental issues of the existing gift card system, with incurring minimal changes to the current infrastructure.

KEYWORDS

Blockchain, Retailer Gift Card, Smart Contract, System Security

INTRODUCTION

The gift card was firstly introduced in the United States around the mid-1990s to allow consumers to pre-purchase some giftable credits in advance of an eventual decision on what to purchase. Since then, the annual sale of the retailer gift card across the States was rapidly increasing, and exceeded 100 billion USD within only two decades (Offenberg, 2007). Nowadays, the gift card has already been a trump of merchants to encourage customers to spend more, and therefore becomes an important marketing strategy (Austin & Huang, 2014; Horne & Bendle, 2016).

But on the contrary, the existing ecosystem of the retailer gift card often places the buyers and/or the recipients in many troublesome situations (Grauschopf, 2018; Mirza, 2007; Offenberg, 2007; Principe et al. 2009), including but not limited to the annoying cashing of some unwanted cards and tremendous gift card frauds caused by the untraceable redemptions/issuances.

First and foremost, it is unavoidable that people might receive some unwanted gift cards (Offenberg, 2007; Principe et al. 2009), and cashing these cards becomes extremely costly or even rather risky for normal people (Mirza, 2007). There are generally two choices for people to cash their unwanted gift cards in practice: (1) they can resell the unwanted cards to a gift card kiosk website (e.g., Cardpool.com), and the kiosk website can then resell the cards to other people; (2) a card owner can directly exchange an unwanted card with another peer, under the witness of an e-commerce platform (e.g., eBay). The former method is rather costly. For example, at the time of writing (May 20th, 2019), Cardpool.com only pays $88.5 for a $100 Walmart gift card. Therefore, people are more willing to resell their unwanted cards via the latter way, i.e., through an e-commerce platform such as eBay or Craigslist, to avoid the high cost of employing the gift card kiosk website (Grauschopf, 2018). But the thorny "fair exchange" dilemma of on-line sales unavoidably steps in (Pagnia & Gärtner, 1999), which means the buyers might take the cards without paying, and/or the sellers can get the payments but never deliver the cards. Even worse, bearing the fact that gift cards can be redeemed nearly by anyone at any time without any identification, the on-line exchange of gift cards is even more challenging than other on-line sales. In particular, when a dispute is raised by the buyer to claim that she receives a gift card having no balance, the e-commerce platform can barely verify whether the seller indeed delivers an already redeemed card or the buyer is lying as she spends the card by herself. Due to such intrinsic challenges of cashing unwanted gift cards, the occurrences of such resale scams are happening everywhere and every day, which corresponds to an urgent demand to incorporate secure resales into the existing gift card ecosystem.

Second, it is also remarkable that the issuances and redemptions of gift cards are dealt inside the retailer as in a "black-box", indicating that customers have to somehow fully trust the retailer and believe the retailer will honestly handle issuances and redemptions in the "black-box". But putting such unconditional trust in the retailer seems elusive in practice, and it becomes arguably necessary to leverage external auditions to deter the misbehaviors of retailers (Marden & Forsyth, 2007). Nevertheless, many real-world incidents continue to illustrate that it cannot be effective to audit these "block-box" retailers (Barth & Schipper, 2008). In particular, after Toy R Us and Radioshack were bankrupted, many of those companies' unredeemed cards lose all values, although Toy R Us and Radioshack should have repaid the cardholders, as unredeemed gift cards actually correspond to sort of liability (Fried et al., 2015). More generally speaking, when the retailers are required to be responsive to the liability incurred by the unredeemed gift cards (e.g., when Toy R Us and Radioshack are filing bankruptcy), there lacks an effective method to audit the retailers. It therefore becomes elusive to enforce the retailer to faithfully repay this special liability caused by unredeemed gift cards. The above issue calls for an urgent realistic demand, that is how to ensure the issuance and redemption of gift cards to be auditable, such that no malicious retailer can hide any sold gift cards from an external auditor (Wright, 2018).

All the above problems are even seemingly inherent due to the restrictions of the existing gift card system, as it is a "black-box" that has too few hardcoded APIs to support a broader variety of demands. As such, the resale of unwanted cards, the external audition for the card balance in circulation and so forth cannot be well supported. One might argue that the retailer can upgrade its infrastructure for new features, but this trivial solution corresponds to significant changes of the existing system, and subsequently translates into a substantial cost. Let alone, the simple upgrade of the retailer's system still relies on the elusive assumption of the "honest" retailer, which is rather unrealistic in practice as discussed earlier.

Noticing these fundamental issues of the existing gift card ecosystem, it becomes enticing to leverage the blockchain to enhance the gift card at first glance. The blockchain is an already well-established infrastructure, which can serve as an external third-party trusted for correctness and availability (Ahmad et al., 2019; Monrat et al., 2019; Subramanian & Malladi,2020), so it can be leveraged to faithfully tokenize various assets/rights/securities including the retailer gift card (Chen, 2018; Lee, 2019; Subramanian, 2019). Especially, a few ad-hoc attempts (Sood, 2018; "Tokky:

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