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# **Too Good to Be True? Understanding How Blockchain Revolutionizes Loyalty Programs**

*Completed Research*

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## **Abstract**

In extant loyalty program (LP) studies, one of the main challenges is to keep customers motivated in participation behaviors and achieving financial goals. While some companies have initiated efforts to use blockchain (BC)-based distributed ledgers and smart contract capabilities to reduce LP operating costs and enhance customer experience, academic assessment of BC application in the LP context remains in paucity. In this paper we establish a theoretical framework to explain the effects of BC on LP participation. Guided by the self-determination theory (SDT), we illuminate how the BC-based natures influence the relationship of varying customer motivations (economy, autonomy, competence and relatedness) and perceived value, which consequently induces participation behaviors. We outline 4 propositions to depict the conceptual mechanism based on the theoretical framework, and then employ a case study to illustrate how a BC-enabled LP scheme can help enhance customers' involvement in a point exchange environment.

## **Keywords**

Loyalty programs, blockchain, SDT, motivations, perceived value.

## **Introduction**

Loyalty programs (LPs) have been leveraged by a wide range of industry sectors, including retail, airlines, travel, hospitality, car rental, and finance, as the most important and prevalent mechanism for companies seeking for effective loyalty management (Kivetz and Simonson 2002). The majority (83%) of rewards offered by these LPs are in the form of accumulative points that can be redeemed for goods and services (Berry 2015). Despite the popularity of LPs, there is growing evidence that consumers are becoming disenchanted with the reward they receive for their effort in earning loyalty points (Alejandro, Kang and Groza 2016). In a bid to enhance LP engagement and stay abreast of competition, companies are becoming increasingly creative in their LP design (Zhang and Breugelmans, 2012), but financial impact of the efforts rarely meets expectations (Dowling and Uncles, 1997; Ferguson and Hlavinka, 2007; Kreis and Mafael, 2014). Part of the reason is that the viewpoints and welfare benefits of consumers are still rarely considered (Lacey and Sneath, 2006). True LPs demonstrate perceived value by committing to the customers, rather than by demanding the customers to trust the company will provide future customer rewards (Bawa and Shoemaker, 2004; Shugan, 2005). As such, new elements of LP design for customer participation need to be further explored.

Blockchain (BC) is viewed as one of the most important technological artifacts that will influence and reshape business and society in the years to come (Webb, 2015; Kim and Laskowski, 2017). Business service

providing giants (IBM, Deloitte, PwC, KPMG, etc.) have been using BC to alleviate the current plights of LPs, including reducing LP operating costs, accommodating partnerships for multiple brands, and improving customer experience. In traditional loyalty points programs, customers are usually limited on where and when they can spend the points, which undermines customer intentions of accruing or using the points. The BC-based LP will be designed to enhance the feasibility and fungibility of loyalty points by simplifying the engagement process, making it easier and faster for customers to have access to their points and redeem them anywhere, at any time, while the security benefits inherited with encryption techniques could protect loyalty scheme from fraud (Deloitte, 2016). With points accepted as “currency” among various brands, customers can earn, spend, or trade them as an asset that is more relevant to their personal preferences, rather than a liability (e.g., promises of future rewards or deferred rebates) (Shugan, 2005).

However, as an emerging digital technology, BC deployment has been still largely experimental (Kshetri 2018), and both conceptual expositions and empirical evidence are limited about how the BC applications improve LPs. In essence, scholars have not systematically assessed the effects of BC on LPs given the embryonic nature of the BC technology and its nascent deployment in business practice. The paucity of scientific knowledge in this growing yet important arena no doubt warrants further investigations, which galvanizes this study to shed light on BC deployment vis-à-vis LPs management.

Given the pressing problem of the abysmal performance of many LPs, our study is an early attempt to explore a theoretical and empirical knowledge about the way BC application influences customer LP engagement. In this paper, we build a theoretical framework to depict the effects of BC-enabled LP design on the relationship of customer motivations and perceived value which induces consequent participation behavior. We then adopt a case study to examine the impact of BC application on customer LP engagement enhancement. By contributing to the literatures of BC and LP in information systems research, this study reveals that BC as an innovative technology is capable of enabling firms to enhance customer perceived value of LP involvement by reforming the points exchange processes

## **Literature review**

### ***LPs design as a moderator in LP management***

Recent research about LPs effectiveness focus on accounting for LPs design elements (choices, requirements, deadlines, and reward options) as a feasible approach to the controversies concerning the usefulness of LPs for value creation (Evanschitzky et al., 2011; Kumar and Shah, 2004). LPs vary enormously in their design, which exerts an impact on LP effectiveness (d'Astous and Landreville 2003; Liu and Yang, 2009; Nunes and Dreze, 2006; Zhang and Breugelmans, 2012). Several studies look at the design of LPs to examine how much a consumer has to spend to receive a loyalty point (e.g. Dorotic et al., 2012; Roehm et al., 2002), whereas some other studies examine the fairness of redeeming loyalty points based on equity theory (Kwong et al., 2011; Danaher et al., 2016). Furthermore, a variety of studies base their analyses on psychological mechanisms and examine the undermining effects of extrinsic rewards on intrinsic motivation in the context of LPs (Kim, Shi, and Srinivasan 2001; Kim and Ahn, 2017).

### ***Customer motivations and perceived value***

The motivations for LP participation refer to consumers' needs related to LP activities, while perceived value represents the cognitive evaluation of the utility of the LP to satisfy those needs (Kreis and Mafael, 2014). The self-determination theory (SDT) implies that various reward designs and contexts affect motivation differently, and they can be classified into two categories: extrinsic and intrinsic (Deci and Ryan, 1987; Deci and Ryan, 1990; Ryan and Deci, 2000; Dorotic et al., 2012). To obtain a detailed understanding of how customer motivations and value perception are connected, it is necessary to consider customer value as a multidimensional, personalized concept that is affected by customer motivations (Woodruff, 1997; Polo and Sesé, 2009). In a theoretical review paper of LP effectiveness, scholars argue that LP-induced change to consumer behaviors typically results from three aspects of mental processes: customer status, habits and relationships (Henderson, Beck and Palmatier, 2011). Some scholars defined perceived value as three dimensions: economic, psychological and interaction value (Kreis and Mafael, 2014).

## BC Applications

BC is a decentralized platform which contains information about all the transactions ever executed and works on consensus protocols, creates a digital ledger of transactions and allows the participants on network to edit the ledger in a verifiable, changeless, and secure way that shared over a distributed network (Singh & Singh, 2016). Since its inception in 2009, BC use has expanded into a wide range of industry sectors beyond the financial domain (Tapscott & Tapscott, 2016), such as the energy sector, (Burger et al., 2016; Lavrijssen and Carrilo, 2017), the supply chain & logistic sector (Tian, 2016; Iansiti & Lakhani, 2017; Korpela et al., 2017; Kshetri, 2018), the music industry (Rethink Music Initiative, 2015), employment management (Ying et al., 2018) and the healthcare sector (Hoy, 2017). BC applications can range from simple to complex transactions and information exchange and smart contracts can be used to regulate these transactions (Ølnes et al., 2017). One of the most promising applications of BC is expected to be deployed in the management of intangible assets (e.g. intellectual poverty, Internet domain, loyalty points) (Tencent, 2017).

## Conceptual framework

### Key natures of BC-based LP design

The original BC application “bitcoin” is based on a smart contract focusing primarily on transactions of crypto currencies, where an electronic payment system based on cryptographic proof instead of trust allows any two willing parties to transact directly with each other without the need for a trusted third party. A peer-to-peer distributed timestamp server is used to generate computational proof of the chronological order of transactions for solving the double-spending problem and protecting the traders from fraud (Nakamoto, 2008). According to the principle of bitcoin exchange network, the BC-based point exchange system is assumed to run by three entities as follow: *Issuer*, the entity who generates the point for the decentralized exchange by defining and issuing it; *Company*, the entity who creates loyalty awards aiming for effective loyalty management and gives points to its customer for these awards; *Customer*, the end user of the point exchange system, where he acquires point from company and dispose it in the marketplace.

The BC-enabled LP scheme, usually applying permissioned blockchain technology, is able to integrate multiple channels of loyalty assets with intelligent point-of-service devices into the network, with near-real-time transparency resulting in cost savings. Within the network, consumers are able to purchase goods and services with points obtained from flight mileage, hotel bonus, gas cards, and retailer rewards at near real-time, or transfer their points to peers. Many of the BC-based LP projects remain in corporate announcements of intention, while few are currently deploying (see Table. 1).

No.	Company	Country	Industry	Launch time	Points exchange scenarios
1	Chanticleer	US	Restaurant	Mid-2018	Among Chanticleer’s 5 holding restaurant brands.
2	Hitachi-PointInfinity	Japan	Point management	Tested on February 2018	Among partners including restaurants, cafes and shopping outlets with a total of over 150 million members.
3	Gege Points	China	Point management	February 2018	Among 209 brands within an offline shopping district.
4	UnionPay	China	Payment	/	Among branded banks, further with supermarkets, malls, gas stations and telecom companies.
5	Singapore airlines	Singapore	Airline	July 2018	KrisFlyer membership to use “digital KrisFlyer miles” for point-of-sale transactions at participating retail merchants.
6	Rakuten	Japan	Ecommerce	/	Among Rakuten’s holdings/services.

7	Royal Bank of Canada	Canada	Bank	/	Real-time exchange of loyalty points, instead of waiting for 8 weeks under the current scheme.
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**Table 1. Several companies that intend to apply BC-based LP schemes**

Referring to authentic data (e.g., official websites, official announcement in media, etc.) of the above companies, we summarize three essential features of BC-enabled LP schemes, which have significant benefits over current ones: **Real-time exchange** (realizes near-real-time exchange and redemption of rewards points, by lowering the amount of time [to seconds] firms take to process transactions and data), **Multi-brands exchange** (accommodates multiple brands and their LPs, while facilitating their interaction in terms of the convertibility and exchange of the points), and **Peer-to-peer exchange** (allows the access to the connections with peers in social communities, and supports deals between individuals with reciprocal goals and demands). Below we will explain the ways these BC natures influence LP engagement behaviors.

### ***SDT motivations and customer perceived value***

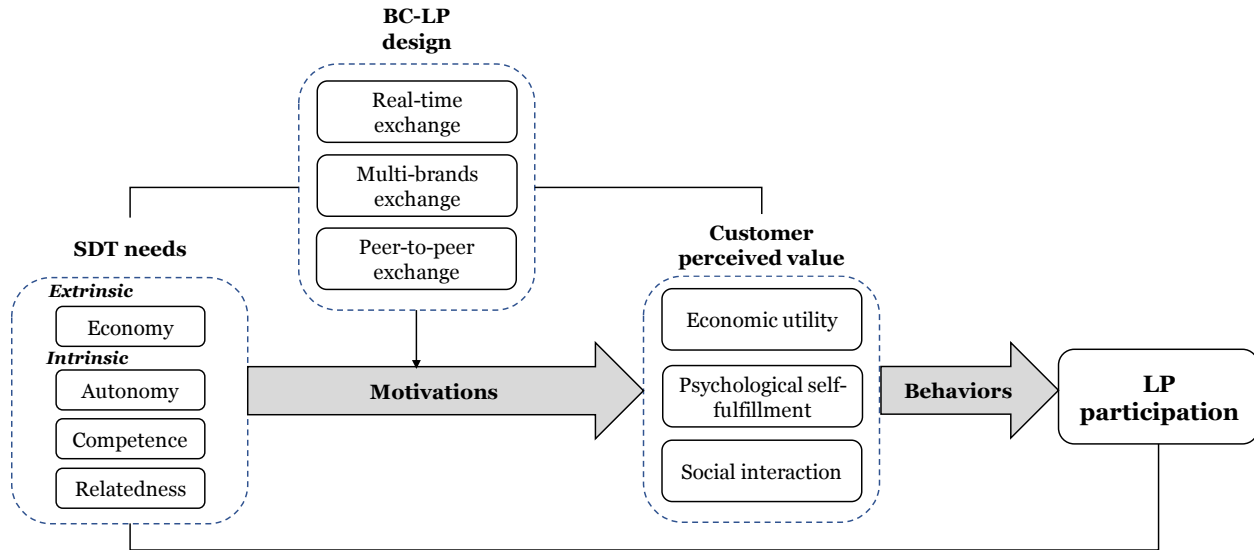
Motivation, as an inner drive, corresponds to physiological processes that influence directions and persistence of behaviors (Moos and Marroquin, 2010). Among motivation theories applied in LP management, self-determination theory (SDT) is an empirical one that delineates the intricacies of human cognitive and behavioral regulation (Baumeister and Vohs 2007). Motivation analysis based on SDT has already been applied in the context of education (e.g., Shi et al., 2014; Dadiz and Baldwin, 2016) and pro-social behavior (e.g., Osbaldiston and Sheldon 2003; Weinstein and Ryan 2010). Based on SDT and previous literatures (Shi et al., 2014; Meyer-Waarden, 2013), we define customers motivations for LP participation as the following four dimensions: **Economy** (extrinsic motivation, a sense of saving money from LP activates), **Autonomy** (intrinsic motivation, a sense of internal assent of one's own behaviors), **Competence** (intrinsic motivation, a sense of controlling the outcome and experience mastery), and **Relatedness** (intrinsic motivation, a sense of connection and interaction with others within a community).

We connect the above motivations with actual value perception that results from satisfying these needs. When a LP is designed to be effective (cheaper, easier, faster, and/or more secure over points accruing and redemption), then it can deliver varying perceived value to different customers. Following this logic, we propose three categories of value perception: **Economic utility** (primarily relates and stems from financial advantages, such as price discount or gifts offering, and can be connected with extrinsic motivations), **Psychological self-fulfillment** (emphasizes a product's ability to enhance customer's self-concept and can be connected with intrinsic motivations), and **Social interaction** (can be derived from feelings of belonging to a community/like-minded peers or having relationship with a brand or company, and can be connected with intrinsic motivations).

### ***Effects of BC on LP participation***

From a resource-based view, IT or its applications play a significant role in enabling firms to offer superior services and consequently deepen the relationships with their customers (Melville et al., 2004; Ray et al., 2005; Zhang et al., 2011). The key of the theoretical analysis of this paper is to explore how BC, as an information technology on the rise, influences value creation in a LP context.

We specify the processes of BC impacts guided by SDT regulation (Shi et al., 2014): meeting the needs of **Economy**, **Autonomy**, **Competence** and **Relatedness**, as shown in Figure 1.



**Figure 1. Overview the effects of BC on LP participation behaviors.**

### **Towards satisfying the need of Economy**

Existing reward systems usually take days or even weeks to reflect customers' purchases and points (Royal Bank of Canada, 2016). If point exchange process can be faster and easier, the point will become an asset with more value for its holder. So near-real-time LPs based on BC application have a strong focus on the economic motivation and, consequently, add economic utility value to a customer's decision to engage the specific LP repeatedly. Besides, the peer-to-peer LPs also can serve the needs of economically motivated customers. For example, a customer who plans to extend his holiday can exchange his extra airline points at a premium price with another person, who is eager to get a timely flight. Obviously, BC application proves privacy and security of the deal while enhancing customers' economy utility value by saving/earning money.

- *Proposition 1.* Loyalty program will enhance economic utility value of the customer with economy motivation, when its point exchange is (1) real-time, and (2) peer-to-peer.

### **Towards satisfying the need of Autonomy**

The need for autonomy refers to an individual's perception of how much he has control over the action. An environment that supports the need for autonomy is likely to allow a customer to have choices as a means of expressing himself. Therefore, the BC-enabled LP system, with flexible choices and options in choosing rewards and seamless exchange process across individuals, can make customer feel in control. Finally, customer perceives a psychological value of self-fulfillment by feeling that his behavior is based on his own intention (Shi et al., 2014).

- *Proposition 2.* Loyalty program will enhance psychological self-fulfillment value of the customer with autonomy motivation, when its point exchange is (1) multi-brands, and (2) peer-to-peer.

### **Towards satisfying the need of Competence**

The customer with need for competence regularly pursue the rewards for fulfilling a desire or a goal. When his own behaviors turn to the cause of satisfied consequences, he represents a positive emotional response, such as feelings of pleasure or enjoyment (Zeithaml, 1988). Apparently, if customer with competence motivation is satisfied by his own choices of the reward options or transaction objects, he tends to perceive more value of psychological self-fulfillment. Besides, since the perceived value of fulfillment is defined as the balance between the perceived benefits and the perceived costs of attaining these benefits (Meyer-Waarden, 2013), so a faster and easier system featured with real-time exchange really works.

- *Proposition 3:* Loyalty program will enhance psychological self-fulfillment value of the customer with competence motivation, when its point exchange is (1) multi-brands, and (2) real-time.

## Towards satisfying the need of Relatedness

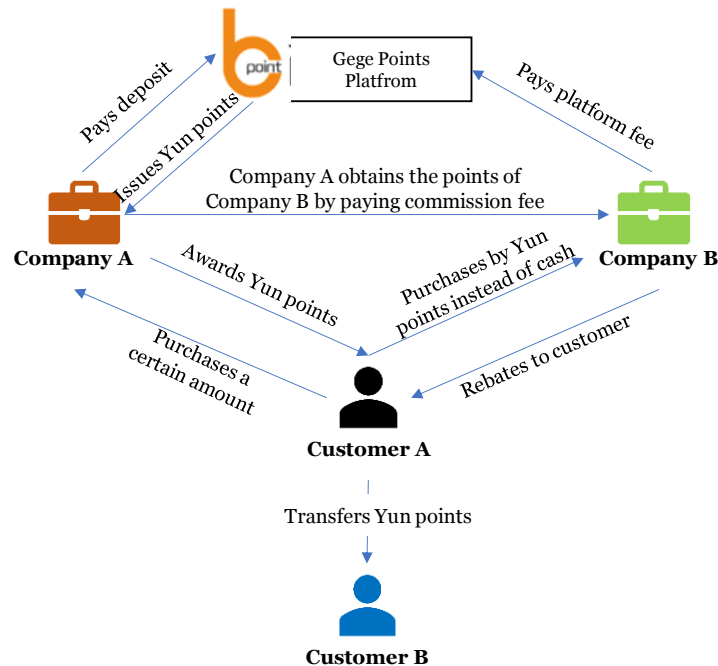
The need for relatedness means feeling connected to peers. Relatedness can be enhanced by connecting customers to a community with the same interest or goals. For consumer with relatedness needs, the LP that allows point exchanges across individuals with reciprocal goals and demands can act as a powerful facilitator for the creation of social interaction value.

- *Proposition 4.* Loyalty program will enhance social interaction value of the customer with relatedness motivation, when its point exchange is peer-to-peer.

## Case study

Following the theoretical model, we now present a real-world scenario of a BC-enabled platform in China. Gege Point (<http://gege.newblockchain.cn/index.php?s=/addon/Bubi/Wap/index.html&openid=-2>) is a point management company and it allows its users to track and exchange loyalty points based on the BC technology which operates digital ledgers.

The token point issued by Gege Point is defined as Yun Point and is supported by Bumeng which is among the first BaaS (Blockchain as a Service) in China. Figure 2 explains the functioning of its BC-enabled system: the *Issuer* is Gege Point, who has the power to mint Yun points and sell to *Company A* for deposit. Or *Company A* buys the points issued by *Company B* for a commission fee. *Company A* gives Yun points to *Customer A* for free as an award of purchase activities. *Customer A* has optional choices, either converting Yun Points to purchases of *Company B*, or transferring to *Customer B* in the system.



**Figure 2. Functions of Gege system.**

Gege platform has the very natures for BC-enabled smart contract operation: BC foundation streamlines execution and administration of loyalty rewards processes, giving all participants *near-real-time* transparency, and making the platform faster and more reliable than traditional ones; the single wallet platform on a permissioned BC technology manages *multi-brands* membership programs, and provides customers various redemption options via one interface for interlinked programs; through rigorous Proof of Stake and well-programmed blocks, the platform is able to operate *peer-to-peer* exchanges without intermediaries for privacy protection.

Now, one of Gege Point's project that has been launched is a BC-enable point management platform for an offline shopping district in Guangdong province, China. 208 brands of the shopping district have

accumulated over 2000 members during the last two years, but after the Gege system was deployed in Feb. 2018, it has successfully attracted over 20,841 customers to use the BC-based point cards within one week, according to Mr. Xiaogang Huang, the general manager of Gege Point. Apparently, the BC features motivate customers' participation behaviors.

- Towards satisfying the need of *Economy*: customers are allowed to convert points for purchases at discount prices (i.e. a Granz microwave, which costs 439 RMB in retail, costs 399 points on Gege Point, and 26 customers have exchanged for it), and thus perceive the value of economic utility.
- Towards satisfying the need of *Autonomy*: the platform adds 209 brands of an offline shopping district into its exchange platform. The brands provide award achievements ranging from physical products (i.e. 3C products, home supplies, car accessories) to digital awards (i.e. insurance cards, retailer coupons, gift cards, phone cards), and customers thus acquire more control over points and perceive value of self-fulfillment.
- Towards satisfying the need of *Competence*: customers can redeem the points conveniently via one interface -- Gege website, rather than various loyalty platforms, so they can realize their specific redemption goals in a faster and easier way, which makes them feel fulfilled.
- Towards satisfying the need of *Relatedness*: customers are allowed to transfer their points to other peers and perceive value of social interaction through experiencing connections to social communities.

The case of Gege Point suggests that customers' participation can be motivated by the BC-enabled LP design.

## Limitations and conclusions

The current study has a few limitations. First, we adopted a theoretical conceptual framework based on the SDT to explore the relationship of customer motivation and perceived value moderated by BC-enabled LP design. However, LP as an institutionalized incentive system itself, could not directly lead to loyalty behaviors (Henderson et al., 2011). Future research needs to continue to explore the complicated relationships among BC-based LP design, LP engagement, and customer loyalty behaviors (e.g., purchase retention, word of mouth, etc.); second, our study used only one case to examine the conceptual model. Future studies should use multiple cases with various industries and regions to measure the impacts of BC on LP participation more comprehensively.

This study is an early attempt to analyze the BC impacts on LP, as it establishes a theoretical framework to explain the effect of blockchain in LP participative behaviors. We apply the self-determination theory for defining the needs for economy, autonomy, competence, and relatedness, while perceived value is categorized into three dimensions: economic utility, psychological self-fulfillment and social interaction. In a conceptual model, we explain the effects of BC application on the relationship of varying customer motivations and the corresponding perceived value, and then outline 4 propositions based on the mechanism. A case study on Gege Point is adopted to prove that in a real world scenario, the BC-enabled applications can enable companies to increase customers' LP engagement intentions by reforming the points exchange processes.

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