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Is it time for marketing to reappraise B2C relationship management? The emergence of a new loyalty paradigm through blockchain technology

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ABSTRACT

Blockchain technology is predicted to become a powerful driver of marketing transformation. At present, most envisioned use cases are in an early stage with an uncertain industrial impact and an immature theoretical integration in academic research. To help close this research gap, we investigate how blockchain-based loyalty programs transform B2C relations through innovative customer services that bear important properties of a sharing economy. Specifically, we identify five potential advantages of blockchain-based programs over traditional loyalty programs pertaining to usage, accrual, relevance, expiration, and transferability. We then apply expectancy theory to assess consumers' perceptions in two empirical studies, both of which reveal an overall preference for blockchain-based loyalty programs over traditional models: an analysis of 5,059 Twitter tweets detects more positive feedback for the blockchain-based program, and a survey of 206 consumers reveals a significantly more positive attitude toward the blockchain-based loyalty program with respect to accrual, relevance, expiration, and transferability.

1. Introduction

Modern marketing comprises a multitude of activities, many of which directly address final consumers with the goal of creating customer value and establishing long-lasting business-to-consumer (B2C) relationships (Kotler et al., 2021). Technology has long served as an enabler or facilitator to directly address and influence consumers via mass media such as radio, television, or the Internet (Danaher & Ros-siter, 2011) and transformative technologies and data driven processes (e.g., Artificial Intelligence, Machine Learning, Mixed and Virtual Reality, Cloud Computing, Internet of Things, blockchain) are increasingly being applied for these purposes (Shah & Murthi, 2021; Sheth & Kell-stadt, 2021). Over the past two decades, the Internet has emerged as the premier channel for versatile marketing activities, and has evolved from a medium for unilateral communication (Web 1.0) to one that allows for bidirectional transactions (Web 2.0) and more recently enables the exchange of value in a decentralized manner (occasionally termed as Web3) (Treiblmaier, 2021b).

Blockchain is the core building block of Web3 systems that are characterized by peer-to-peer interaction as well as immutable data structures and traceable records. Previous research has identified

numerous application potentials of blockchain technology (Abdollahi et al., 2022) in areas as diverse as supply chain management (Ahmed & MacCarthy, 2022; Wong, Leong, et al., 2020; Wong, Tan, et al., 2020), academia, accounting, and tourism (Radic et al., 2022; Sharma et al., 2021), but also warned against exaggerated expectations and limitations relating to privacy, security and scalability (Hughes et al., 2019). While acknowledging the existence of different types of distributed ledger technologies which might serve as technical building blocks for the applications discussed in this article, we follow the convention of applying the generic term “blockchain” as a (slightly imprecise) synonym for distributed ledgers. This enables us to discuss the basic properties of distributed ledgers without referring to a specific implementation.

Despite being around for several years, the rather slow adoption of blockchain technology by the industry has been attributed to its technological volatility, uncertainty regarding regulations, policies, and standardization, and a lack of technological knowledge (Dehghani et al., 2022; Sharma et al., 2022). Academia was also initially slow to integrate the concept (i.e., the properties of blockchain) in marketing research, but rigorous academic journals have since published numerous articles recognizing blockchain as an important technology that might transform

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marketing processes (Dwivedi et al., 2021), for example by enabling ethical marketing in a sharing economy (Tan & Salo, 2021) or allowing for the transfer of assets in a decentralized manner (Chang & Hsieh, 2022). Together with three other so-called new-age technologies — the Internet of Things, Artificial Intelligence, and Machine Learning — blockchain is predicted to strongly impact future marketing outcomes for customers and firms alike (Kumar et al., 2021). Researchers have identified blockchain's most promising application areas for the enhancement of marketing activities as the improvement of data quality (e.g., by reducing click fraud), the strengthening of customer relationships through increased trust and transparency (Tan & Saraniemi, 2022), privacy protection, digital marketing security, and, importantly, strengthening consumer loyalty (Rejeb et al., 2020).

These ongoing developments and looming transformations pose an exciting opportunity for practitioners and researchers to reconceptualize the traditional roles of marketing (Rangaswamy et al., 2020). In this paper we examine the potential for blockchain-based loyalty programs to disrupt traditional marketing programs by becoming more open and integrating core characteristics of the sharing economy. We postulate that such programs bear the potential to break up structures intended to lock-in customers and to eliminate or at least reduce the influence of powerful monopolies and intermediaries. According to Eckhardt et al. (2019, p. 5), a sharing economy is a “technologically enabled socio-economic system with five key characteristics (i.e., temporary access, transfer of economic value, platform mediation, expanded consumer role, crowdsourced supply)”. First, temporary access of needed offerings replaces permanent ownership (to some extent). Second, the (rather formal) transfer of economic value between entities distinguishes the sharing economy from informal sharing activities with no expectation of compensation. Third, a sharing economy relies on an independent platform that is not controlled by any specific entity. Fourth, consumers are no longer on the receiving end only and, as prosumers, provide both demand and supply. Fifth, the supply can be pooled and provided by a group of participants rather than one single entity. As we will outline in this paper, loyalty programs based on blockchain have the capability to enable some or all of these core properties of the sharing economy, thereby profoundly altering interactions between consumers and companies. To investigate this assumed disruption in detail, we initially identify the changes to be anticipated through the first research question:

RQ1: What blockchain-specific program properties can influence customers' loyalty and value expectations?

Based on the identification of these core properties, we then use the basic premises of expectation theory to investigate how consumers' expectations of future value-related outcomes differ between a blockchain-based program and a traditional one. In order to do so, we conduct two empirical studies: a sentiment analysis of publicly available Twitter tweets and a consumer survey. The corresponding research questions are:

RQ2: How do public perceptions on social media differ between a blockchain-based loyalty program and a traditional program?

RQ3: Do customers perceive differences between blockchain-based loyalty programs and traditional loyalty programs?

This paper is structured as follows: In Section 2 we discuss the core properties of loyalty programs and introduce the theoretical foundation of our research design. In Section 3 we present our methodological approach, consisting of a sentiment analysis of Twitter tweets as well as a quantitative consumer survey. In Section 4 we illustrate the theoretical implications of our findings for academics as well as the practical implications for managers. We conclude this paper in Section 5 with a brief summary noting limitations and providing an outlook on interesting research avenues.

2. Theoretical background and hypotheses

According to Dick and Basu (1994, p. 99) customer loyalty is “the strength of the relationship between an individual's relative attitude and repeat patronage”. In empirical studies the construct “customer loyalty” is regularly operationalized by measuring attitudinal attachment and actual buying behavior. Loyalty programs comprise all those measures that companies take to create, strengthen, and maintain customer loyalty. This is often done by offering incentives which are accumulated and stored as points that frequently carry fancy names and can later be used to consume specific benefits. Loyalty programs have a long history in marketing and come in many different forms, despite their overall effectiveness remaining controversial. In the following sections we elaborate on various design elements of loyalty programs, current shortcomings, and how blockchain can help to make them more attractive for customers.

2.1. Design properties of loyalty programs

Loyalty programs are regularly designed such that consumers earn rewards by conducting transactions, which can later be redeemed as discounts, free products, rebates, or promotion to a higher tier in the system (i.e., preferred treatment). Many different variants of such programs have been created through different constellations of numerous design elements. Blattberg et al. (2008) differentiate between frequency reward programs, in which rewards are solely based on accumulated points, and customer tier programs, in which different benefits are offered to the respective customer groups. The former provide short-term benefits, while the latter are designed for achieving long-term relationships. Loyalty programs also differ in the amount of partners from which points can be gained and redeemed, with the attractiveness of a program regularly increasing with its number of partners. The type of reward can be differentiated into monetary/non-monetary and direct (i.e., rewards that are closely related to a firm's offering) versus indirect (i.e., other rewards, such as cash) (McCall & Voorhees, 2010). When it comes to the consumer perspective, a differentiation can be made between programs that are voluntary versus automatic, open (i.e., accessible to anyone) versus closed, and, finally, programs in which points accumulate automatically versus manually (Kumar & Reinartz, 2018).

2.2. Loyalty program effectiveness and expectancy theory

The global loyalty management market is valued at USD 4.54 billion in 2021 and expected to grow to USD 24.44 billion by 2029 at a compound annual growth rate of 23.5 % (Fortune Business Insights, 2022). The average American consumer belongs to 16.7 customer loyalty programs (Howarth, 2022). While the overall importance of customer loyalty is undisputed and poses the foundation for elaborate customer relationship management programs, the individual effectiveness and efficiency of existing programs is heavily debated. Already back in (1995), O'Brien and Jones raised the question of whether rewards really create loyalty and pinpointed critical design issues with loyalty programs that lead to inefficient value creation. Many problems and inefficiencies were explained by companies' inherent incentive to lock in customers with the goal of creating monopolies (Varian, 2000) rather than extending their features to acquire new customers (Rejeb et al., 2020). In an empirical study in a Swedish telecom company, Gustafsson et al. (2004) found that the majority of the members did not perceive their membership as adding value or leading to a higher commitment and improved loyalty. A report from Bond Brand Loyalty (2016), based on a sample of nearly 12,000 US and over 7,000 Canadian consumers showed that more than one fourth of all members had never redeemed. Loyalty programs also create complications from a company perspective. For example, in the US a material right is created when customers are given an option to acquire other products at a lower price and accounting must record this right as a contract liability, even though it is

unclear if and how many of these claims will ever be realized (Khayyam, 2021).

Then again, numerous authors highlight the positive effects of loyalty programs and they have been identified as effective tools for building customer-company identification by inducing customers' feelings of status and belonging to a community (Brashear-Alejandro et al., 2016). Dorotic et al. (2014) find that the mere decision to resume a reward enhances purchasing behavior before and after the redemption event. In a recent comprehensive study, Faramarzi and Bhattacharya (2021) investigate whether the introduction of loyalty programs in 260 announcements affected firm value in the form of abnormal stock returns. They conclude that, on average, the introduction of such programs has a positive effect on value and they also find synergies with brand value and advertising intensity but not with customer satisfaction. Bombaj and Dekimpe (2020) investigate the specific role of design, retailer, and country characteristics as moderating factors for a loyalty program's impact on sales productivity. They identify a positive effect of a basic loyalty program that offers immediate and direct awards but also point out that the impact differs between retailers and countries.

In our study we address the concern from Rojanakit et al. (2022, p. 1328) that "a limited number of theoretical lenses have been used to analyse the [sharing economy] phenomenon". We extend previous research by using the theoretical lens of expectancy theory and explicitly focusing on the transformational changes that blockchain-based loyalty programs might bring. Expectancy theory is based on the work of Vroom (1964) and originally postulated that employees' beliefs about valence (i.e., the relevance of a specific outcome), expectancy (i.e., the belief that higher efforts will increase performance), and instrumentality (i.e., the belief that better performance will lead to better outcomes) determine the motivational force behind their pursuit of various activities. Expectancy theory has been successfully applied in numerous marketing-related settings, for example, to illustrate that the motivational perceptions of life insurance salesmen are related to their performance (Oliver, 1974), to understand the conditional role of power in buyer-supplier relationships (Han et al., 2022), and to scrutinize consumer brand engagement (Lourenço et al., 2022). Applied to customer loyalty programs, expectancy theory can help to better understand how consumers perceive such programs and which blockchain-specific program properties they particularly value. Assuming that consumers have concrete expectations about the rewards that they will reap, we postulate that particular properties of loyalty programs induce consumers to exert targeted effort to realize these benefits.

2.3. Blockchain transformation of loyalty programs

Krafft et al. (2020) describe blockchain as an important part of the Fourth Industrial Revolution that helps marketers to bridge the boundary between the virtual and the physical world. It is defined as "a digital, decentralized and distributed ledger in which transactions are logged and added in chronological order with the goal of creating permanent and tamperproof records" (Treiblmaier, 2018, p. 547). Blockchain has specifically been identified as a "technology that will transform customer loyalty programs" (Kowalewski et al., 2017), with the Deloitte Center for Financial Services (2016, p. 3) denoting it an "ideal remedy for what ails loyalty rewards programs". Indeed, previous survey research has confirmed that marketing professionals expect blockchain to have a positive impact on loyalty programs (Lemos et al., 2022). Early research on the subject has already shown that blockchain-based programs can improve customer perceptions of economic value and satisfy their intrinsic motivations (Wang et al., 2019). Concrete examples of how blockchain technology can improve the properties of existing loyalty programs include allowing for immediate transaction (i.e., redemption) settlement and facilitating the transferability of redeemed points between hitherto separated programs.

Recent industry loyalty program implementations illustrate not only the feasibility of the blockchain concept but also how it can be applied to

strengthen customer loyalty. In 2022, for example, the satellite television company DISH implemented a backend token-based loyalty system on the Cardano blockchain that allows users to manage their coins while preserving their privacy through decentralized identification (Sanchez, 2022). Nuraini (2022) lists seven examples of existing blockchain loyalty programs: The miles-based digital wallet KrisPay from Singapore Airlines, which we use as an example for our empirical study; Chanticleer Holdings, an investor in burger restaurant chains; American Express and Boxed, a cooperation between a payment service provider and an online wholesaler; AirBaltic, an airline that incorporates non-fungible tokens (NFTs) into their loyalty offering; Venmo, a provider of credit cards; Shake Stack, a fast casual restaurant chain; and Loyyal, a platform that offers loyalty services for numerous companies. Such examples enabled us to systematically compare traditional with blockchain-based loyalty programs according to properties that have been highlighted in the literature.

To answer RQ1, our comparison identified five main areas in which blockchain-based loyalty programs differ from their traditional counterparts: usage, accrual, relevance, expiration, and transferability. We discuss these five areas in the following sections, noting that we did not consider features that are related to the frontend design of a specific solution (e.g., usability) since blockchain does not necessitate a specific frontend and the respective user interfaces of blockchain-based technologies are undergoing constant development.

2.3.1. Usage

Existing loyalty programs frequently restrict their users to a limited range of selected offerings, many of which represent a company's usual range of products and services at a discounted price. One of the core features of blockchain technology is the easy sharing of information in real time among a group of authorized participants (in case a private and permissioned solution is used). Such enhanced flows of reliable information can increase the supply of goods and services, facilitate the settlement of payments, and enhance the range of offerings to consumers (Treiblmaier et al., 2021). The exchange and trading of loyalty rewards is enabled by the use of tokens according to the rules of the program, which can be included in so-called smart contracts on the blockchain. In combination, these enhanced informational and transactional features make it easier to create "coalition" or "multi-vendor" programs (Bacia, 2022). Utz et al. (2022) design such a blockchain-based loyalty system in the energy sector and report that their test customers welcome the opportunity to exchange their tokens for fiat money or to pay for related services, such as the rental of electric cars or scooters. They conclude that customers appreciate the sense of choice and real agency when it comes to selecting their desired services and functions. Hence, we hypothesize:

H₁: A higher number of redemption options in a blockchain-based loyalty program has a positive effect on consumer attitudes.

2.3.2. Accrual

Complex background processes in traditional loyalty programs often delay the crediting of points into a customer's account. In tiered programs, the points are regularly accrued based on the amount spent yet are not added immediately. In this regard, blockchain-based solutions can provide companies with a competitive advantage by directly adding the acquired points to a consumer's account and making them available for immediate redemption. This can be compared to Bitcoin's transaction settlement process, in which a confirmed transaction can be considered final after a few additional blocks have been added (which happens, on average, every 10 min). If needed, these points can be visible all along the supply chain (Hoyer et al., 2020). To reduce volatility, more advanced approaches include the combination of loyalty programs with stablecoins, which are tokens whose value is tied to an underlying asset or basket of assets (Caudevilla et al., 2022). Accrual can also be facilitated by creating loyalty programs with branded stablecoins, which creates a seamless user experience and, again, avoids the

volatility of unpegged cryptocurrencies (Dulith, 2022). We therefore hypothesize:

H₂: Immediate accrual of points in a blockchain-based loyalty program has a positive effect on consumer attitudes.

2.3.3. Relevance

Kumar et al. (2021) refer to blockchain as a new-age technology which enables the design and delivery of personalized engagement in real time. High data quality in terms of accuracy and timeliness is a prerequisite for tailoring relevant offers to diverse customer groups. The effectiveness of customized and personalized offers has long been a topic of interest in academic research and numerous publications have confirmed its beneficial effects (Liao & Sundar, 2022). Apart from allowing for easy data access and data sharing among market participants in real time, blockchain technology also allows final consumers to stay in control of their personal data and to determine who has access to them (Travizano et al., 2020). New developments in digital identities therefore allow for the creation of personalized offerings in a self-determined manner. Taking into account blockchain's potential to improve personalization, we hypothesize:

H₃: Personalized offerings in a blockchain-based loyalty program have a positive effect on consumer attitudes.

2.3.4. Expiration

Previous research has shown that loyalty programs can be perceived negatively if they exert pressure on customers to redeem rewards (Pez et al., 2017). From a company's perspective, the intention to push customers toward using their points is understandable, since either the consumption or the removal from their respective accounts helps them to update their balance sheets. From a consumers' perspective, however, the opportunity to hold loyalty points in a cash-like manner without any specific expiration date would be preferable. While blockchain in this case does not necessarily act as an enabling technology, since it would also be possible to create traditional loyalty programs without an expiration date, its combined features, such as easier usage, faster spending, and transferability, can help to create systems with a higher throughput and versatility. Additionally, the immutability of records on a blockchain allows for auditing in real-time and thus enables companies to calculate their potential obligations. We therefore postulate that blockchain facilitates the design of systems in which the accrued rewards do not necessarily need to have an explicit expiration date:

H₄: Loyalty points without an expiration date in a blockchain-based loyalty program have a positive effect on consumer attitudes.

2.3.5. Transferability

Bitcoin was designed as an open and decentralized system which made possible the online transfer of value between peers. Blockchain-based loyalty programs can be similarly designed, such that customers gain enhanced control over their accumulated points and trade them among peers, thus creating a frictionless system (Deloitte Center for Financial Services, 2016). These capabilities are further enhanced by the emergence of the token economy, which facilitates the trading of any type of good or services through tokens representing value. Based on a comprehensive literature review, Klarin and Suseno (2021) identify the user experience and collaborative consumption as important key themes within the sharing economy field. In loyalty programs, this pertains not only to fungible (i.e., interchangeable) points, which can be used similarly to currency, but extends to so-called non-fungible tokens (NFTs), which represent unique assets that can be traded among peers via the use of a distributed ledger (Belk et al., 2022; Treiblmaier, 2021a). We therefore hypothesize:

H₅: The transferability of loyalty points in a blockchain-based loyalty program has a positive effect on consumer attitudes.

The properties described in the previous sections were identified by an analysis of existing loyalty programs that also included the design properties of soon-to-be completed blockchain-based programs. Table 1

Table 1

Design properties of loyalty programs.

Property	Blockchain-based LP	Traditional LP
Usage	Loyalty points can be used to pay the purchase price — in full or partially — at any of the partnering merchants	Loyalty points can be used to get discounts for selected services from a specific travel category (e.g., hotels, car rentals)
Timing of point accrual	Earned points are credited to the user account immediately in real-time	Earned points are credited to the user account with a delay of several weeks
Relevance	Users can browse generic offers as well as receive personalized ones, based on their previous shopping preferences	Users can browse generic offers available for every-one
Expiration	Loyalty points have no expiration date	Loyalty points expire after 3 years
Transferability	Loyalty points can be transferred to another user	Loyalty points cannot be transferred to another user

summarizes the descriptions of the five respective properties as they are used in the two scenarios presented in the survey.

3. Methodology

Given the dearth of empirical information on blockchain-based applications from a customer perspective, we designed two empirical studies to better understand how blockchain-based loyalty programs are perceived by consumers. In the first study we address RQ2 regarding perceptual differences on social media. Specifically, we analyze publicly available tweets on Twitter to assess differences in sentiment expressed toward a blockchain-based loyalty program in comparison to a traditional one. In the second study we conduct a survey to answer RQ3 pertaining to consumer perceptions of differences between traditional and blockchain-based loyalty programs. Taken together, the qualitative analysis of Twitter tweets using real-world data from an existing airline program in combination with a tailored survey represent complementary research approaches which allow us take two different angles to answer RQ2 (i.e., public perceptions on social media) and RQ3 (i.e., consumer attitudes in a survey study).

3.1. Study 1: Twitter

In study 1 we compare users' Twitter postings about Miles & More, a traditional loyalty program that includes 40 airlines, and KrisPay, a blockchain reward wallet from Singapore Airlines that integrates the reward app Kris +. Previous research has confirmed the relevance of social media data and their applicability to support marketing decisions (Moe & Schweidel, 2017). Consequently, an analysis of publicly available postings gives a first indication if these programs are perceived differently.

3.1.1. Research design

The Twitter data was collected through the Twitter Developer API (Developer Platform, 2021). Specifically, we used the Twitter Academic Research Product Track V2 API endpoint to gain a complete pool of historical data and extracted the tweets using the programming language R (4.0.5), the software RStudio (1.4.1106–5), the package "academictwitterR" and the library "academictwitterR" (Barrie & Ho, 2021). All mentions of the Lufthansa Miles & More program's official account (@Miles_and_More) were considered for the time period between 2009 and 02-01 (date of account creation on Twitter) and 2021–05-21. In total, we retrieved and analyzed 4,120 tweets. Since there was no official Twitter account of Kris + during that period, we retrieved tweets using the hashtags #KrisFlyer OR #KrisPay for the timeframe between 2018 and 07-24 (official release date of KrisFlyer's blockchain-based component) and 2021–05-21, which resulted in a total of 939 tweets.

We then created a corpus as well as a term-document matrix for each loyalty program and performed sentiment analyses. The corpus was cleaned by removing unneeded symbols, such as whitespaces, punctuation marks, stop words in English and German languages, numbers, URLs, retweets, and odd symbols. To build a term matrix from the cleaned corpus, the text mining package “tm” was used (Feinerer et al., 2020). The sentiment analysis was conducted with the package “syuzhet” (Jockers, 2015) and plotted using the package “ggplot2” (Wickham, 2016).

3.1.2. Results

The aggregate results of the sentiment analysis can be found in Fig. 1. The analysis is based on the NRC Word-Emotion Lexicon, which categorizes the sentiments expressed in the tweets into eight emotional categories: anger, anticipation, disgust, fear, joy, sadness, surprise, and trust (S. M. Mohammad & Turney, 2013). This elaborate emotion lexicon is based on categories suggested by Plutchik (1980) (i.e., fear, anger, joy, sadness, acceptance, disgust, expectation, surprise) and was further refined by Mohammad and Turney (2010).

Tweets for both loyalty programs are dominated by the two positive emotions “trust” and “anticipation”, with 25.53 % of KrisPay tweets and 25.03 % of Miles&More tweets being allocated to the trust category. “Sadness” was ranked third for the Miles & More program, as opposed to “joy” for KrisPay. In total, Miles & More had 39.51 % positive, 34.34 % neutral, and 26.14 % negative tweets, while the blockchain-based KrisPay had 50.69 % positive, 29.39 % neutral, and 19.91 % negative tweets. KrisPay received more favorable assessments than Miles & More in all categories, with the most pronounced differences between the two programs being found in the categories of “anticipation” (20.93 % vs 17.41 %), joy (17.26 % vs 10.58 %), and sadness (7.60 % vs 15.62 %).

3.2. Study 2: Consumer survey

The first study provided some evidence that a blockchain-based program is better reviewed in Twitter than its traditional counterpart. However, confounding variables can potentially distort the results of a Twitter study, including known variables such as the brand of the airline or its overall service level, as well as other extraneous influences that are harder to identify (e.g., user interface). To control for the impact of branding and other known and unknown external variables, our second

empirical study does not refer to a specific extant program, instead focusing explicitly on the five properties that blockchain-based loyalty programs can help to improve.

3.2.1. Research design

The data for study 2 was collected in May 2021 via a survey administered through the platform SoGoSurvey (https://www.sogosurvey.com) using a convenience sampling technique. The link to the survey was distributed via social media among various Facebook communities, most of them being based in Austria, as well as WhatsApp and Telegram. Participants were randomly assigned to one of the two groups — blockchain-based loyalty program vs traditional loyalty program — to minimize the influence of confounding variables. Each group of participants was exposed to a different scenario relating to the usage, accrual, relevance, expiration, and transferability of loyalty programs. The survey started with a short introduction to the purpose of the study and informed participants about the features of an airline loyalty program. Participants were then asked to assume that they are members of the program and were asked to assess each of the five properties. The description of the scenarios (blockchain-based loyalty program vs traditional loyalty program) included the five properties and the wordings shown in Table 1.

Subsequently, they were asked to evaluate the attractiveness of the respective options according to their economic and psychological value based on validated scales from Kreis and Mafael (2014) as well as Meyer-Waarden (2013). We modified the items to fit the topic of the study while taking into account the recommendations from Wieland et al. (2017) for scale modification. Specifically, face validity was ensured through an expert consultation and construct validity was confirmed using factor analysis. The measurement items used to assess the participants after learning about each loyalty program property are listed in Table 2. Each item was measured on a five-point scale with answers ranging from 1 (“Strongly Disagree”) to 5 (“Strongly Agree”).

3.2.2. Results

206 respondents completed the survey, 69.9 % of which were female and 30.1 % male. Most participants (82.5 %) were between 25 and 44 years old and the majority had either a bachelor’s (25.3 %) or a master’s/PhD (72.3 %) degree. The participants were randomly assigned to one of two groups to answer questions related to the properties of either

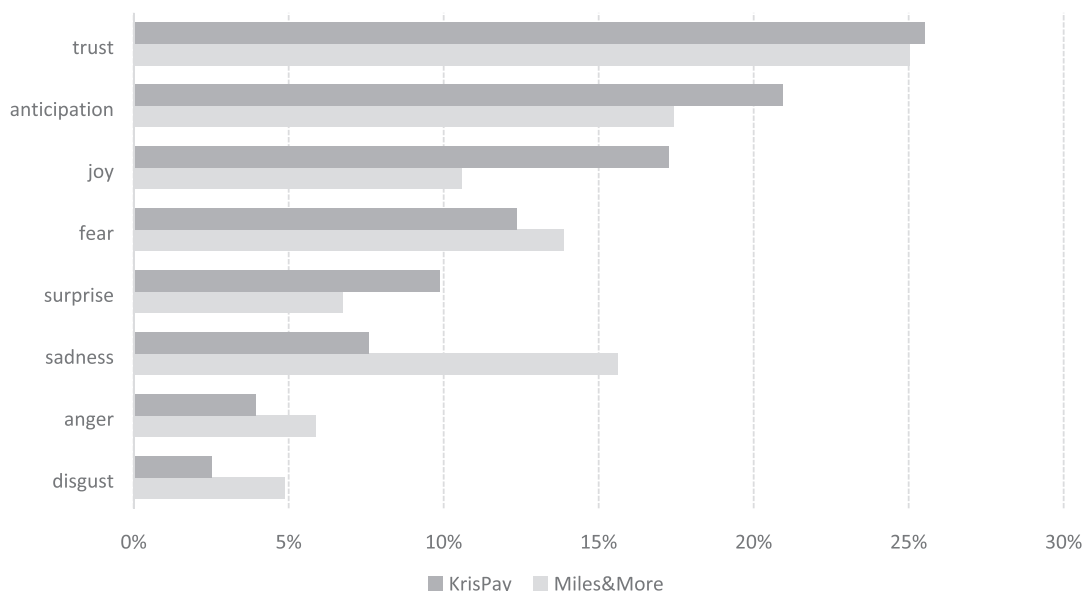


Fig. 1. Comparison of Tweet sentiments between KrisPay and Miles & More using the NRC Word-Emotion Lexicon.

Table 2
Measurement items for economic and psychological value.

	Item	Source
Economic value	It would be economically reasonable for me to become a member of the LP	Based on Kreis and Mafael (2014)
	The LP would give me monetary advantages	Based on Meyer-Waarden (2013)
	The LP would offer me additional value for my money	Based on Kreis and Mafael (2014)
Psychological value	I would enjoy being a member of the LP	Based on Kreis and Mafael (2014)
	The LP would give me pleasure when I exchange miles	Based on Meyer-Waarden (2013)
	I feel like the LP makes me special compared to other customers	Based on Kreis and Mafael (2014)

a blockchain-powered (N = 110) or a traditional loyalty program (N = 96) (cf. [Table 1](#)). In [Fig. 2](#) the descriptive results are shown in boxplots. Except for the property “usage”, where the median scores were identical (3.5), the respondents preferred the blockchain-based version over the traditional version regarding all other properties (Accrual: 3.67 vs 3; Relevance: 3.5 vs 3; Expiration 4 vs 3; Transferability: 3.75 vs 2.75). The final construct, Total Loyalty, was measured with three items (“I would like the proposed loyalty program more than other programs”, “I would have a strong preference for the proposed loyalty program”, “I would recommend the proposed loyalty program to others”) and also confirmed a preference for the loyalty program with blockchain properties over its traditional counterpart (3.67 vs 3.00).

We conducted Welch t-tests to test our five hypotheses to account for the fact that the variances were unequal in the two groups. We found no significant effect for “Usage”, ($t(203) = -0.20, p = 0.84$), and “Relevance” ($t(203) = 1.87, p = 0.06$) was marginally significant. The other three properties “Accrual” ($t(201) = 4.02$), “Expiration” ($t(197) = 6.71$), and “Transferability” ($t(200) = 5.93$) turned out to be highly significant with $p < 0.01$. The difference in “Total Loyalty” was also

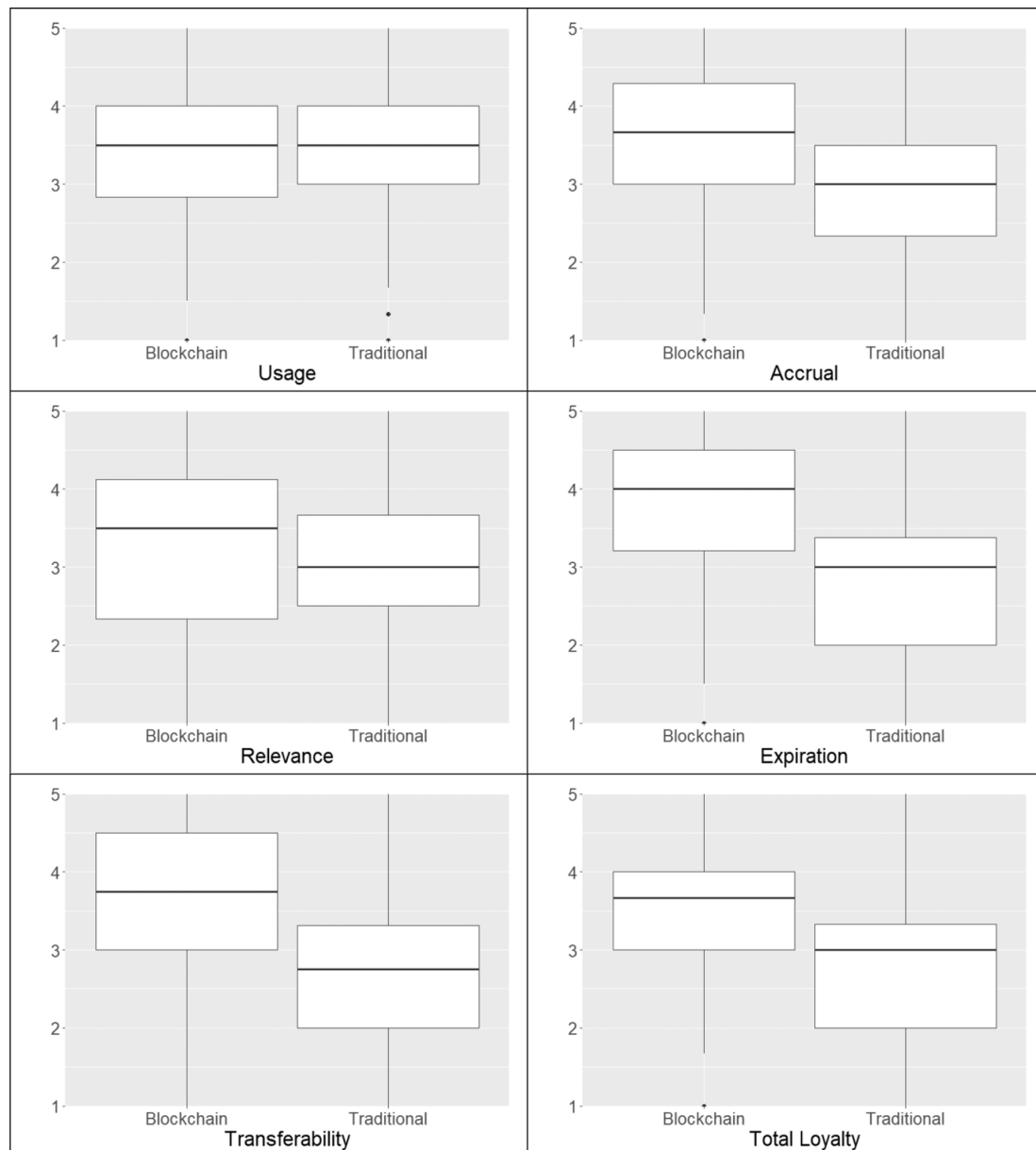


Fig. 2. Comparisons of consumers’ perceptions of loyalty programs.

Table 3
Descriptive statistics.

Sample (n = 206)				
Gender		Male	Female	
		62 (30.1 %)	144 (69.9 %)	
Age		18–24	25–34	35–44
		8 (3.9 %)	84 (40.8 %)	86 (41.7 %)
Education		Secondary	Bachelor's degree	Master's degree /PhD
		5 (2.4 %)	52 (25.3 %)	149 (72.3 %)
Employment status		Employed	Self-employed	Other
		138 (67 %)	38 (18.4 %)	30 (14.6 %)
Yearly Income (n.a. = 4)		< €18 k	€18 k - €31 k	€31 k - €90 k
		37 (18.3 %)	20 (9.9 %)	118 (58.4 %)
				>€90 k
				27 (13.4 %)

Property		N	Mean	Std. Deviation
(1) Usage	BCLP	110	3.433	0.878
	Trad. LP	96	3.457	0.816
(2) Accrual	BCLP	110	3.483	0.934
	Trad. LP	96	2.967	0.905
(3) Relevance	BCLP	110	3.271	1.099
	Trad. LP	96	3.002	0.966
(4) Expiration	BCLP	110	3.776	1.048
	Trad. LP	96	2.767	1.100
(5) Transferability	BCLP	110	3.641	1.072
	Trad. LP	96	2.755	1.066
Overall Loyalty	BCLP	110	3.573	0.954
	Trad. LP	96	2.705	0.985

Table 4
Summary of Hypotheses Testing.

Hypothesis	Result
H1: A higher number of redemption options in a blockchain-based loyalty program has a positive effect on consumer attitudes.	t(203) = -0.20, p = 0.84, Not significant
H2: Immediate accrual of points in a blockchain-based loyalty program has a positive effect on consumer attitudes.	t(201) = 4.02, p < 0.01 Significant
H3: Personalized offerings in a blockchain-based loyalty program have a positive effect on consumer attitudes.	t(203) = 1.87, p = 0.06 Marginally significant
H4: Loyalty points without an expiration date in a blockchain-based loyalty program have a positive effect on consumer attitudes.	t(197) = 6.71, p < 0.01 Significant
H5: The transferability of loyalty points in a blockchain-based loyalty program has a positive effect on consumer attitudes.	t(200) = 5.93, p < 0.01 Significant

highly significant (t(198) = 6.40). The descriptive statistics are summarized in Table 3 and the results of the hypothesis testing are shown in Table 4.

4. Discussion

The starting point for this study was the assertion that blockchain technology will significantly impact future marketing activities (Rejeb et al., 2020) and especially loyalty programs (Kowalewski et al., 2017). In this regard, it can enable programs whose features resemble the core properties of a sharing economy, as defined by Eckhardt et al. (2019): temporary access, transfer of economic value, platform mediation, expanded consumer role, crowdsourced supply. Our study investigates how the idiosyncratic properties of blockchain, such as the immutability of data and shared real-time data access, allow for the design of systems that offer new value propositions and how such properties are actually perceived by potential customers. Blockchain-based loyalty programs facilitate the transmission of ownership by using loyalty points in the form of tokens that can easily be converted in a specific good or service. In this respect a blockchain-based platform (which is usually operated by a consortium or in a fully decentralized manner) serves as an

intermediary and transactions are recorded in an immutable manner. On such platforms, consumers not only collect loyalty points from various suppliers but can also transfer these points to peers in case they do not need or want to use the rewards themselves. In this regard, the points constitute a fungible means of exchange. Our study has shown that it is particularly the blockchain properties related to accrual, lack of expiration, and enhanced transferability that can create additional value from a consumer perspective. In the following sections we discuss important implications for academics and practitioners.

4.1. Theoretical implications

Previous research has postulated that blockchain has significant potential to transform customer loyalty programs (Lemos et al., 2022), but literature is scarce on (a) how exactly this can be achieved and (b) how customers will perceive the properties of such programs. Moreover, a theoretical framework is needed to guide future rigorous investigations on this matter. To overcome this shortcoming, this study adopts a guiding framework based on Expectancy Theory, which was originally developed to predict employees' behavior based on their valence, expectancy, and instrumentality (Vroom, 1964). When it comes

to marketing activities, this theory explains how consumer decisions are driven by expected outcomes and can be motivated by the creation of positive incentives (Solomon et al., 2013). In this regard, we heed the call from Breugelmans et al. (2015) to advance academic research on loyalty programs with the goal of better understanding their designs and future trends caused by technological change. Our findings can help to advance academic research in three important areas:

First, design-based research can benefit from our identification of core loyalty program properties that can be enhanced by blockchain technology. Based on descriptions of existing and envisioned blockchain-based programs, we identify usage, accrual, relevance, expiration, and transferability as five areas in which blockchain can induce major improvements from a consumer perspective. Designers of blockchain-based loyalty systems can build on our findings and focus on these core areas to improve customer value by enhancing the specific value propositions of loyalty programs.

Second, behavioral research can build on our identification of core constructs by incorporating them into sophisticated theory-based models. We have sought to assess both the economic and psychological value of loyalty programs to customers across five salient properties of such programs. The description of the respective properties presented in Table 1 represents a first effort to operationalize the constructs such that they can be integrated in future empirical investigations. Developing more sophisticated theory-based models can help to shed further light on how the expectation of future benefits impacts customer attitudes and behaviors. Additionally, the identified constructs can easily be integrated in other theoretical frameworks as either antecedents or consequences of value creation. To give just a few examples: technology acceptance research might want to consider our five properties as behavioral antecedents of intention to use; theories pertaining to consumer decision making processes might integrate them as relevant criteria for purchase decisions; and researchers interested in organizational or market structures (e.g., transaction cost theory) might consider how information sharing among companies, as a consequence of increased transferability, necessitates new structures.

Our application of expectancy theory provides a first glimpse at how the outcomes of blockchain-based loyalty programs might supersede those of traditional programs, but more refined models are needed to better understand how the positive incentives enabled by blockchain-based programs impact actual consumer behaviors.

Third, our research illustrates the fusion of hitherto separate economic concepts and shows that blockchain-based loyalty programs constitute a step toward a more fluid economic paradigm in which those programs are no longer used to lock in customers, but rather constitute a seamless transition toward open and transparent exchange systems. In this regard, the emerging systems bear many features of a sharing economy, such as the easy transfer of economic value, mediation by a platform, and the expansion of the consumer role (Eckhardt et al., 2019). From a marketing perspective, the boundaries become blurred between proprietary systems that tie consumers to a particular brand and alternative concepts that incentivize individuals to consume a brand's particular product or service but simultaneously offer them access to a comprehensive exchange program in which the accrued points can be easily traded among peers and exchanged for a wide range of products and services with many participating partners.

4.2. Managerial implications

The digital transformation of core marketing activities is an ongoing process that, over the years, has helped companies to better adjust their offerings to customer needs. This applies also to loyalty programs, which are an important tool in a marketer's toolbox that can make an important contribution to revenue, profit, and shareholder value (Wayman, 2020). Quite often, however, these programs do not function as intended and their performance remains below expectations (Gustafsson et al., 2004). In this regard, our study makes two important contributions.

First, the findings indicate that by enhancing the properties of existing programs and designing new ones, blockchain technology has the potential to disrupt marketing processes and to facilitate direct interaction with final consumers. The industry has already recognized the potential of such programs and trailblazers have begun to develop new programs that capitalize on the features of blockchain. Our research not only promotes further awareness of the topic among managers, but also offers concrete insights into how existing programs can be redesigned and what properties customers might value most. Second, we specifically outline how blockchain technologies can facilitate innovative loyalty programs that enable more open forms of economic relationships: not only between customers and companies, but also between customers on a peer-to-peer level. Managers now have at their disposal the appropriate tools to design programs that offer enhanced possibilities for the participants to exchange their loyalty points and increase the range of offerings.

The ongoing digital transformation also necessitates that incumbents rethink their respective value-creating role within the value network. This entails the redefinition of how value creation can be achieved and offers opportunities for new intermediaries (Tan et al., 2021). In this respect, blockchain-based loyalty programs force companies to reevaluate their existing business models and to rethink how they can capitalize on their loyalty programs. Industry experts have already acknowledged that improved blockchain-based systems not only benefit consumers but also companies that are willing to modify their existing programs and undergo a profound transformation process (Bacia, 2022).

5. Conclusion, limitations, and future research

This study establishes blockchain-based loyalty systems as an important topic for practitioners and academics alike. First, by conducting a narrative literature review, we identify those properties where blockchain can make a difference to existing loyalty programs. Specifically, it can increase usage by allowing payments in full or in part, increasing the product range, facilitating the accrual of bonus points, enhancing the relevance of offerings, avoiding the expiration of loyalty points, and making the transfer of points easier. Second, comparing publicly available Twitter tweets in a sentiment analysis, we find a more positive reception for a blockchain-based program than a traditional program. Third, a survey of consumer attitudes toward the respective properties of two loyalty programs finds that the blockchain-based program receives a better general evaluation and significantly higher scores across four of the five properties. Our studies use a combination of methodological approaches to address the question of whether blockchain-based loyalty programs are perceived differently than traditional programs from two separate angles. The results confirm that such differences might indeed exist, underscoring the relevance of the topic for practitioners and justifying more in-depth investigation from researchers.

Our study has several limitations. Most importantly, it is likely that we did not identify all potential use cases of blockchain in loyalty systems. For example, the introduction of NFTs might help companies to create new features within their loyalty programs that are not based on fungible and uniform points. Furthermore, depending on the particular implementation, the technology might introduce additional risks pertaining to privacy and security, of which consumers might be unaware. Then again, it would be technically possible to implement blockchain-based systems in combination with digital identifiers that offer enhanced privacy features for consumers.

As far as the empirical studies are concerned, various factors (e.g., brand, service level) might confound the comparison of the Twitter tweets. We purposefully selected the wallet KrisPay since it was among the first and most prominent examples of a blockchain-based loyalty solution. However, it has to be taken into account that the KrisFlyer program from the Singapore Airline Group is not a fully decentralized solution and exhibits only several of the properties can be enabled by

blockchain technology.

The quantitative survey was designed so as to control for some of these factors and was based on a randomized sample to eliminate several biases (e.g., selection bias) and enhance statistical conclusion validity, but different sample compositions would be needed to improve external validity. We treated blockchain as a backend technology and did not include any properties in our study that relate to the user frontend. However, as long as blockchain applications necessitate specific knowledge and technical skills, these need to be considered in academic studies as well as practical implementations. Finally, it has to be noted that several of the properties that we investigated can theoretically also be offered in traditional loyalty programs but this might run counter to the interests of companies (e.g., changing the expiration of loyalty points).

Our research opens up new avenues for follow-up studies and we explicitly encourage academics to incorporate the properties that we identified in confirmatory, theory-based studies using samples from other countries and cultures. We also encourage researchers to keep an eye on new technological developments which are fostered by blockchain technologies. These include the emergence of NFTs as a fast means of value transfer via blockchain that can also be enriched with additional functionality such as a pleasing design or interactive features. Finally, the emergence of the metaverse as a virtual space in which humans can share experiences and, importantly for marketers, transact with companies, presents a promising testing ground for the feasibility and the added value of blockchain-based loyalty programs. These topics must be incorporated into academic research agendas in order to foster greater understanding of how blockchain-based loyalty programs can contribute to consumer empowerment and value co-creation. An incremental research agenda is needed that refines previous research on the relevance of loyalty in marketing and also gives practitioners valuable advice on how to best implement programs that attract and retain consumers.

CRedit authorship contribution statement

Horst Treiblmaier: Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Elena Petrozhitskaya:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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