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Blockchain as a resource for building trust in pre-owned goods' marketing: a case of automobile industry in an emerging economy

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ABSTRACT

Blockchain technology (BCT) has caught tremendous attention from businesses. In the present study, the authors propose that if BCT is used to track a product's life cycle, that is, when it was manufactured, purchased, and used by the first and subsequent owners, the information asymmetry present in the pre-owned automobile market can be significantly reduced. The study uses a qualitative procedure to explore the challenges which buyers, sellers and intermediaries face while buying and selling pre-owned automobiles, specifically in emerging economies. Theoretical constructs of the resource-based view and the trust-based marketing theory are used to explore the extent to which BCT can influence customer purchase intention and the marketing performance of firms dealing in pre-owned automobile products in emerging economies. We collected data by conducting eight focus group discussions with generation Y and Z individuals who had experience of buying or selling pre-owned automobiles. We also conducted five personal interviews with managers of pre-owned automobile online/omnichannel retailers to understand the industry's point of view. Three themes emerged during the study: 'current challenges in pre-owned automobile transactions,' 'scope of blockchain in pre-owned automobile transactions,' and 'concerns regarding blockchain adoption in pre-owned automobile transactions.' We present our findings based on these three themes. Further, we propose a conceptual model and provide theoretical and managerial implications for the pre-owned automobile industry.

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1. Introduction

Generation Y and Z consumers are rapidly adapting digital technologies in their day-to-day consumption (Parment, 2013; Turner, 2015). Despite this, digital transactions for pre-owned products are lagging. Pre-owned products include automobiles, refrigerators, mobile phones, laptops, desktops, jewelry, etc. (Ackerman & Hu, 2017; Gavazza et al., 2014; Kim et al., 2021). The market size of pre-owned automobiles is larger than that of new automobiles in India. It

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had reached 4.4 million units by 2020 (Statista, 2020). It is likely to increase exponentially at the rate of more than 20% per annum due to the pandemic-induced economic constraints (Statista, 2020). Currently, major players in the Indian pre-owned automobile space are Mahindra First Choice, Hyundai H Promise, Cars 24, Maruti True Value, and OLX (Intelligence, 2021).

Information helps consumers in making informed purchase decisions on comprehensive marketplace options (Diez-Olivan et al., 2019). When one of the transaction parties has more knowledge or access to additional and important information than the other, it is known as information asymmetry (Zhang et al., 2015). Asymmetric information impacts the overall pre-owned goods economy and leads to consumer failure in the used car markets (Kim et al., 2021).

Blockchain technology (BCT) has caught tremendous attention from businesses. Its applications can be found in various areas such as finance, marketing, healthcare, and supply chain (Dan et al., 2018; Dubey et al., 2020; Galati et al., 2021; Nigam et al., 2022; Sangal et al., 2022). In the present study, the authors propose that the information asymmetry present in the current pre-owned automobile market can be reduced significantly if BCT is used for tracking a product's life cycle from the time it was manufactured until purchased and used by the first and subsequent owners (Dubey et al., 2020). It is necessary to understand product life cycle for building trust in the marketing of the pre-owned goods. As firms plan to invest in BCT as a resource and to enhance trust, it becomes vital to understand how the resource-based view (RBV) theory and the trust-based marketing theory (TBMT) can be put to work together to improve business performance (Dubey et al., 2020).

The need of implementing BCT in pre-owned products is due to the manufacturing aspects. In the automobile industry, an industry that is heavily dependent on components and raw materials from multiple suppliers, transparency and accountability are vital components for optimal supply chains (Reddy et al., 2021). The automotive supply chain (ASC), like any other supply chain, is under a considerable pressure to increase transparency and decrease process uncertainty. Due to this drive, a robust and reliable technology platform – for sharing and monitoring information among stakeholders of the ASC – is necessary (Reddy et al., 2021). Enterprise information systems support complete product data at the start of the products' existence (Zhang et al., 2017). However, post purchase, the owners of the goods are the consumers; therefore, the data collected during the middle and end of the life of product is not real time, and thus is unreliable and incomplete. Consequently, inefficiencies can result from a decision made on the basis of incomplete and inaccurate product lifecycle data (Chatterjee et al., 2021; Chaudhuri et al., 2021; Farsi et al., 2018; Zhang et al., 2017).

The present study uses a qualitative methodology of the focus group discussion (FGD) and the personal interview (PI) to explore the challenges buyers, sellers and intermediaries face while buying and selling pre-owned automobiles via digital channels in emerging economies. This study further explores the scope of BCT in removing such challenges. Thus, the main purpose of this study is to address the research question drawn from the RBV and the TBMT, that is, 'To what extent can BCT effect customer purchase intention and marketing performance of firms dealing in pre-owned automobile products in emerging economies?' Performing a thematic analysis (TA), we present our findings under three themes— 'current challenges in pre-owned automobile transactions,' 'scope of blockchain in pre-owned automobile transactions,' and 'concerns regarding blockchain adoption in pre-owned automobile transactions' (Braun & Clarke, 2019).

In the following sections, we discuss prior literature and theoretical underpinnings. It is followed by research methodology and discussion of the findings. We conclude the paper with a conceptual model, theoretical and managerial implications followed by conclusions, limitations, and the future research directions.

2. Prior literature and research gap

The literature on pre-owned (second-hand) products is relatively a grey area (Lu & Shang, 2019). 'Second-hand shopping refers to buying goods that are previously owned by others' (Padmavathy et al., 2019, p. 20). Researchers have worked on the purchase of pre-owned clothing (Kapoor & Khare, 2019; Tarai & Shailaja, 2020); warranty strategies for pre-owned tech products (Lu & Shang, 2019); and store choice behavior for pre-owned merchandise (Darley & Lim, 1993). The contribution of BCT regarding pre-owned products varies with new opportunities for redesigning the products (Ølnes et al., 2017) and with its implications on marketing pre-owned products (He et al., 2021; Shen et al., 2019). For example, the theoretical application of resource utilization component in the RBV and trust component in the TBMT of BCT for pre-owned products is limited in the current literature (Ølnes et al., 2017). To further investigate this perspective, it is vital to understand that as firms plan to invest in BCT as a resource and to enhance trust, it becomes essential to comprehend how RBV and TBMT improve business performance. This leads to the main research question: 'To what extent can BCT effect customer purchase intention and marketing performance of firms dealing in pre-owned automobile products in emerging economies?' Therefore, the following sub-section outlines theoretical frameworks of this study.

2.1. Theoretical underpinning

The advent of 'pure digital brands' has had significant ramifications for marketing theory and practice. The RBV focuses on the idea of the firm's difficult-to-copy characteristics as sources of superior efficiency and competitive advantage (Madhani, 2009). Resources that are valuable, uncommon, inimitable, and non-substitutable enable companies to build and retain competitive advantages, and use these resources and competitive advantages to achieve superior results (Madhani, 2009; Priem & Butler, 2001). Since Jay Barney's seminal paper on the RBV and sustained competitive advantage in 1991, this study stream has dominated strategic management research for nearly three decades. However, in an ever-changing global business environment, academics and practitioners alike are increasingly abandoning conventional and time-tested strategies in the favor of more creative and adaptive strategies (Portillo-Tarragona et al., 2018). Therefore, we use 'the schematic representation of the resource-based view of competitive advantage theory' by Grant (1991). This theory serves the dual purposes of linking marketers' managerial capabilities and marketing strategies for sustainable competitive advantage (Madhani, 2009, 2010).

The trust component in the TBMT for pre-owned products plays a vital role in marketing by strengthening consumer-to-business relationships. In exchange relations, trust (interpersonal) is considered essential because it is important as an element of social capital and has a significant impact on firm performance, customer satisfaction, competitive advantage, and other economic outcomes including lower transaction costs and reduced search costs (Maji & Bandyopadhyay, 2018; Mayer et al., 1995; Sangal et al., 2022).

In a community, trust establishes order. Without trust, a social actor can create adverse outcomes in each interaction (Doney & Cannon, 1997; Ozbal et al., 2020). Second-hand goods' markets are dependent on a consumer's perception of risk and actions that follow (Kim et al., 2008; Maji & Bandyopadhyay, 2018). Consumer trust has a positive effect on purchase intentions. At the same time, it has a negative effect on consumers' perceptions of risk. Moreover, as consumer perception of risk decreases, consumer purchase intention increases. TBMT is also used in fostering customer relationships through open communication and unbiased knowledge (Kim et al., 2008, 2021)

Adoption of any technology by businesses in order to hoping to improve sales may not always work unless the technology solves a key problem faced by the organization. For this, we combined the two theories of the RBV and the TBMT as BCT's role for the industry of interest (automobile) can be better explained with this dual theoretical viewpoint. We propose that if BCT is used to track a product's life cycle, that is, when it was manufactured, purchased, and used by the first and subsequent owners, the information asymmetry currently present in the pre-owned products' market can be significantly reduced. As a tool, BCT can serve as a critical resource for the automobile industry, which can in turn serve as a source of trust for the individual. As our research focuses on insights both from the managers (BCT as a resource) and individual participants (BCT as a source of trust for buyers/sellers) in the automobile industry, the integration of these two theories is appropriate in the context of our study. Therefore, using a qualitative study procedure, we explore the extent to which BCT can help in reducing the information asymmetry and the transaction cost for pre-owned products.

3. Research method

We use the theoretical constructs of the elemental RBV and TBMT to study current challenges and for adopting digital mediums while purchasing pre-owned automobiles. Further, we explore BCT as solution for these challenges. Finally, we explore the concerns of pre-owned automobile industry participants in case BCT is adopted as a resource. We follow an interpretive approach and use qualitative methods because we wanted to understand how individuals interpret their actions (Clarke & Braun, 2014; Paul, 2017). This approach allowed us to focus on real-life experiences in real-world settings (Creswell & Poth, 2016). We explore why a digitally savvy user finds digitally transacting for pre-owned automobiles challenging.

We conducted and recorded eight FGDs and five PIs using virtual platforms (Table 1). PI we conducted with the managers (intermediaries) working in the pre-owned automobile space. Appendix A offers additional details about the participants in the FGD and PI processes. We relied primarily on FGDs because they allowed the exploration of the complex interplay of motivation, attitude, and learning based on the interaction among participants (Creswell & Poth, 2016). We segmented the participants as past and current buyers and past and current sellers. The FGDs and PIs were conducted in September 2021 virtually. Virtual medium was preferred over the traditional in-person FGDs to attract participants from different geographical regions (Halliday et al., 2021; Stewart & Shamdasani, 2017). We conducted each FGDs with eight participants. The participants were between the age of 18 and 40 years (generation Y and Z). Each FGD, on average, lasted about 90 minutes. We hit theoretical saturation after two FGDs per group and no

Table 1. Brief description of various FGD and PI conducted.

Item	Description
FGD – 1 & 5	Individuals who have sold a vehicle between March-2020 and August-2021
FGD – 2 & 6	Individuals who have currently listed a vehicle for sale.
FGD – 3 & 7	Individuals who have purchased a pre-owned vehicle between March-2020 and August-2021.
FGD – 4 & 8	Individuals who are currently looking to buy a pre-owned vehicle.
PI	Current managers of organized online/omnichannel retailers of pre-owned vehicles.

new insights were gained (Corbin & Strauss, 2014). We ensured that in every panel, one of the moderators had a technical working knowledge of BCT, who assisted the participants in understanding BCT and its applications, if needed.

We invited participants by placing advertisements on various social media sites, stating our requirements for the FGDs. We screened the tentative participants' responses based on their experience in either selling or purchasing pre-owned automobiles between March 2020 (beginning of Covid lockdown) and August 2021. To prevent self-reporting bias in the process, we mentioned in our advertisements that we need participants who have bought/sold or are looking to purchase/sell pre-owned passenger automobiles (two-wheelers and cars) as well as those who have not done either of these activities via digital channels (Scott & Balthrop, 2020). For screening the participants, we used items from different marketing scales such as the technology readiness index scale, technology usage discomfort, technology usage motivation, etc. (Bruner et al., 2005; Parasuraman, 2000). We asked questions (items) such as, 'For you, products and services that use the newest technologies are much more convenient to use,' 'You like to use most advanced technology available,' 'You enjoy the challenge of figuring out high tech gadgets,' 'Sometimes you think technology systems are not designed for ordinary people,' 'To you technology seems to fail at the worst possible time,' 'Using BCT (technology) would provide me a feeling of independence,' etc. (Parasuraman, 2020).

We tried to maintain respondent homogeneity in our FGDs, as past research has established that participants discuss more freely when they can connect easily with other participants. Therefore, we grouped participants into buyers and sellers focus groups based on the time elapsed since they transacted in the pre-owned automobile market (Braun & Clarke, 2019). We prepared a structured moderator guide to assist the FGD process (Braun & Clarke, 2019). We used NVivo software to analyze the verbatim and followed the TA procedure. TA broadly consists of three steps: systematic reading, interpretation, and arrangement of data bits into themes (Braun & Clarke, 2019). We analyzed the text by following the three-step process of comprehension, synthesizing, and theorizing. We read each of the transcripts individually, then compared them to find out the commonalities and differences between them, and thus identified the themes. Before finalizing the themes, we made a final check whether our themes were in order and made minor changes if needed.

We compared the FGD and PI transcripts with their recordings for accuracy before analyzing them to establish descriptive validity. Further, we followed a 'part-to-whole' and 'whole-to-part' approach to ensure we had interpretive validity. Using this approach, we ensured that our analysis did not go out of the context of the study (Kim et al., 2008; Maxwell, 1992). Lastly, to ensure our study's credibility and trustworthiness, we asked the same questions using a standard questionnaire (Appendices B and C).

4. Findings based on the three major themes

Our goal in this study was to explore the challenges buyers, sellers, and intermediaries of pre-owned automobiles in emerging economies face while transacting via digital channels despite technological advancements. Further, we explored how BCT could address these challenges. Finally, we discuss concerns in case BCT is adopted by the pre-owned automobile industry. We present our findings from the qualitative procedures under three themes. The first theme, 'current challenges in the pre-owned automobile transactions,' discusses the various challenges faced by the buyers, sellers, and intermediaries in pre-owned digital markets. The second theme, 'scope of blockchain in pre-owned automobile transactions,' outlines how blockchain can address some challenges and add value to the pre-owned automobile market. The final theme, 'concerns regarding blockchain adoption in pre-owned automobile transactions,' discusses how the current market dynamics may change if the pre-owned automobile marketplace adopts the blockchain.

4.1. Current challenges in the pre-owned automobile transactions

The pre-owned digital marketplace is divided into two broad classes. On the one hand, the individual parties can transact independently on listing websites such as OLX and Quikr or use the services of online aggregators (intermediaries) such as Car Dekho, Bike Dekho, Cars24, etc. Websites such as OLX do not provide any assistance for transferring ownership. Digital aggregators such as Car Dekho do assist with automobile transfer paperwork, automobile pre-check, etc. On websites such as OLX, the transfer of automobile is directly between the parties while in the case of intermediaries, the intermediaries may stock pre-owned automobiles and sell them at a later date. Despite these developments, buyers and sellers are not enthusiastic about adopting digital channels for selling and purchasing pre-owned automobiles as expected. We discuss the insights related to the challenges faced by the buyers, sellers, and intermediaries.

4.1.1. From the buyers' perspective

The pandemic, government rules, and rising commodity cost have increased the demand for pre-owned automobiles. Purchasing new automobiles has become difficult because of changing government norms related to automobile safety and emission standards, and the recent multifold spike in commodity prices. "The cost of the new automobile has increased manifold . . . automobile manufacturers' have increased their prices by 10% or more" (F3P7). As a result, many buyers have shown a strong interest in the pre-owned automobile market. 'Travelling via public transport became a complete no-no for me. Purchasing a new automobile was out of my budget, I decided to look for a pre-owned automobile' (F4P3).

The decision to purchase a pre-owned automobile becomes challenging as it depends on what is on sale in the market. Unlike a new automobile for which a prospective customer can directly approach a showroom of preferred brands and begin the automobile selection process, the pre-owned automobile market depends on active sellers. Participants shared that a buyer may not be able to find the desired automobile brand and need to decide what is on sale at the time. "I wanted to buy a bike from Honda that was less than five years old but wasn't able to find one" (F6P8). 'I was looking for an automatic four-wheeler under 0.7 million INR, . . . I had to extend my budget . . . ' (F3P4).

Further, the decision must be made where to look for a pre-owned automobile. The participants of the buyer FGDs shared that they had the options of brand-authorized pre-owned retailers, online second-hand websites (aggregators and no-frill), and offline independent agents. The prices of the automobiles differed with the medium they decided to purchase. 'The brand-authorized sellers charge you the most and have a very less scope of negotiation while independent (direct) sellers may have a fairer and appropriate asking price' (F4P5). The price may not always be fair and easy to assess. 'There is no way to determine a fair price for a pre-owned automobile precisely. It is more of a subjective perception than an objective evaluation' (F3P5). The subjectivity comes in the process as buyers have inhibitions related to a pre-owned automobiles sold digitally or otherwise. Buyers are not sure about how the previous owner has used the automobile throughout the ownership. They are skeptical of automobile modification, timely servicing, and maintenance (using genuine parts) of a pre-owned automobile. 'Owners install aftermarket parts to enhance performance, that may make the warranty void' (F4P6). 'Age and odometer reading are two factors that determine the value of an automobile. While age cannot be tampered easily due to proof of registration, the odometer reading is tampered easily before re-selling' (F3P7). 'If the automobile is serviced at an unauthorized service center, there is no proper service history' (F4P3). 'Accidental automobiles are repaired and sold; the severity of the accident is hard to assess' (F7P8).

These challenges are faced by the buyers in both offline and online purchases of pre-owned automobiles. The online medium makes the transaction opaquer. 'Online re-commerce gives access to many more automobiles but completing the transaction online is risky. The claimed automobile condition may not be correct' (F3P2). 'Stolen automobiles are frequently sold online by forging papers' (F4P3). ' . . . difficult to make out if the online seller is genuine or not' (F8P6). Overall, most of the participants in the buyer FGDs agreed that despite the modern technological advancements, their problem with transacting for pre-owned automobiles on digital platforms is linked with information asymmetry. Though the world has gone digital, technological adoption is yet to address this problem.

4.1.2. From the sellers' perspective

Our second set of FGDs comprised of respondents who had sold automobiles in the past or were currently intend to sell one. In the view of the participants, it is not easy for the automobile owners to find the right buyer. When a seller directly puts a digital advertisement on sites such as OLX, they are flooded with messages from multiple users who express their desire in purchasing the automobile and ask for more details. The sellers feel skeptical about disclosing automobile and personal details to every user on digital platforms. When they try to find more information on the user (prospective buyer) profile page, they generally do not see any. 'I feel uncomfortable dealing with profiles that have arbitrary names or no profile picture. If these pre-owned websites make some mandatory background checks rather than putting a disclaimer that transact at your own risk, digital adoption in the second-hand market would see an exponential rise' (F2P2).

Genuine sellers who try to digitally sell automobiles directly to the interested buyers face problems in convincing prospective buyers that the automobile is in mint condition. One of the participants shared, 'I had a two-wheeler in a mint condition . . . difficult to convince the buyers that this is genuine information' (F5P3). Further, sellers need to trade-off better prices for their automobiles vs. selling to a genuine buyer. Improper use of pre-owned automobiles in

the past makes the current seller skeptical of buyers who offer high prices. 'Frequently, pre-owned automobiles are misused' (F5P6). Further, the sellers were contacted by automobile aggregators in the pre-owned automobile market to assist them in selling the automobiles. The agents of such companies initially do not reveal their intention till they get as many details as possible about the current owner and the automobile status. Sellers who want to avoid such agents feel disappointed due to incomplete information. 'Marketers of pre-owned automobiles (intermediaries) will try to connect with me, to act as an agent' (F2P3). Despite a general dislike for intermediaries, to avoid the hassle of dealing with multiple buyers and choosing one of them, some sellers prefer to sell their automobile at a lower price to pre-owned automobile aggregators. The aggregators use their standard marketing tactics and underprice the automobile from the price the buyer intends to get. This leads to dissatisfaction for the seller. 'I sold my car to an authorized dealer. I got way less than what I could have made in selling the car myself' (F6P1). Overall, as in the case of the buyers, the sellers agreed that their problem is linked with information asymmetry and digital market for pre-owned automobiles is anything but transparent despite the digital progress made since the pandemic.

4.1.3. From the intermediaries' perspective

The intermediaries also suffer from information asymmetry issues. Some omnichannel intermediaries own automobile inspection centers to check the condition of automobiles, while others rely on local garages with whom they have an agreement. Despite these facilities, the managers shared that the current owners may hide facts. 'We have to be skeptical with the clients. Even with the latest technology, it is not always possible to assess the condition of the automobile' (IP3). They acknowledged that having ownership of automobile inspection centers is costly but trusting an independent third party also involves an element of risk. ' . . . sometimes these third parties have cut a deal with the customer directly, leading to loss of revenue' (IP4). Further, the managers agreed that they offer sellers a lower value as an insurance to cover for a possible defect with the next buyer due to this information asymmetry. Achieving customer satisfaction for the managers of pre-owned automobile market is tedious. 'When you deal with both the buyer and seller, you have to be smart while aiming for maximum satisfaction of both the parties' (IP4).

This section discussed the challenges that the buyers, sellers, and intermediaries currently face in the digital/omnichannel pre-owned automobile market. In the next section, we discuss the value addition with blockchain for the pre-owned automobile transactions.

4.2. Scope of blockchain in the pre-owned automobile transactions

During the discussion, the moderators specifically focused on BCT adoption after the purchase by the first owner, that is, all the records of services, repairs, insurance, pollution check, etc., to be maintained via BCT that can be shared with the future buyers by the current owners of the automobiles. We discuss the insights related to the scope of blockchain from the buyers, sellers, and intermediaries' perspectives in this section.

4.2.1. From the buyers' perspective

Buyers had a positive opinion on adopting BCT as a critical resource by the pre-owned automobile market. They expressed that they would most likely feel more confident while making a decision and completing transactions digitally with BCT in place. 'If I get

automobile history from a trusted source, it will help in my decision-making immensely' (F7P5). Further, they felt that BCT would be more trustworthy than intermediaries' word-of-mouth assurances and marketing tactics. 'Intermediaries cajole us to believe that the automobile being sold is a value buy, which is a very subjective assessment' (F8P3). We also explored the possibility of completing the transaction digitally, that is, without a physical inspection of the pre-owned automobile. On this point, the participants were slightly hesitant due to their inexperience with BCT. Still, they supported the idea that BCT would reduce their decision-making time and enhance their confidence in dealing with geographically spread sellers. 'If such a technology is adopted, I would still like to see the automobile before making a payment, but unlike now, I will consider sellers from different cities and states' (F7P1). We expect the current hesitation of the buyers to subside with the experience of actual usage of BCT.

4.2.2. From the sellers' perspective

The sellers also appreciated the benefits of BCT. Sellers' primary concern in finding a genuine buyer could be resolved via BCT. Under the current scope of BCT, sellers of pre-owned automobiles appreciated that such a technology would provide authenticity about the next buyer. Sellers would feel more comfortable in interacting and sharing in-depth information about the automobile with the parties they chose to transact with. 'We may not need to sell via intermediaries. If we can authenticate a buyer, we could deal directly' (F1P6). 'BCT possibly can take care of a lot of fraud' (F6P7). If any issues arise later, sellers would also be able to trace the automobile ownership. Further, keeping a record of the automobile usage on a trustworthy technology platform will allow them to demand and obtain higher prices for the automobiles as information asymmetry would be done away with. Lastly, the sellers will keep their identity and automobile details confidential from the intermediaries and disclose them only to selective people.

4.2.3. From the intermediaries' perspective

Intermediaries had mixed feelings about adopting BCT as a resource. We discuss their support to BCT in this section, while their concerns will be addressed in the next section. Managers shared that with BCT, their evaluation process will be simplified and become more transparent. ' . . . If we can find the automobile history from a reliable source, we can offer better prices to the seller' (IP3). BCT will allow the managers to obtain rich data of the automobile condition that, coupled with current technologies, will result in a fast, transparent, and smooth business function. Further, few BCT managers foresee that they will possibly get more business, as they would offer better prices to the sellers. 'I think adopting blockchain will improve customer satisfaction' (IP5). 'With BCT, customers may try to transact with more geographically separated customers. This may lead to a different business opportunity for us' (IP1). Further, the managers expressed that adopting BCT can help them in tracing the automobile sale status. Some of the intermediaries do not purchase the automobiles outright (asset-light model) from the customer. Instead, they find a client for the customer and earn a commission on the sale. Such intermediaries would like to adopt BCT so that the primary seller cannot deal with multiple intermediaries or buyers know the automobiles' whereabouts before discussing with them.

In this section, we saw how blockchain, if used as a resource by pre-owned automobile participants, can address some challenges and improve the overall business model of the pre-owned automobile sector. In the next section, we discuss some of the concerns that the participants shared related to blockchain implementation.

4.3. Concerns regarding blockchain adoption in pre-owned automobile transactions

Individual buyer and seller participants were unable to highlight any significant concerns regarding BCT other than possible technical difficulties. The pre-owned automobile retailers (intermediaries) were the most skeptical in adopting blockchain. They perceive blockchain more as a threat than an ally. 'Our business relies on the poor information that exists in the market about the pre-owned automobiles … If we adopt to BCT, our profits will be possibly squeezed' (IP4). Further, making the process end-to-end transparent can lead to poaching by competitors. Intermediary managers who had technical knowledge of BCT debated the public and private nature of the ledger. 'Public or private ledger will be a matter of concern for us. We would never want to have our data shared via a public ledger' (IP5). The concerns regarding blockchain adoption in pre-owned automobile transactions also include the role of network externalities. A critical mass of users must adopt BCT for it to work (Dubey et al., 2020; Ølnes et al., 2017). Lastly, managers we concerned about the cost of BCT adoption, and feared that they will lose their competitive edge if competitors adopt BCT and they do not.

4.4. Proposed model for future research

Based on the discussion in the previous sections, we propose a model for future studies (Figure 1). We propose that in the context of pre-owned automobiles, BCT can have a positive influence on establishing initial trust between independent parties in a digital environment (Proposition-1). With confirmed identity of the participants along with the data of automobile available via a trusted technology, the trust needed to move ahead with the transaction can be easily established.

Further, in the context of pre-owned automobiles, initial trust can have a positive influence on purchase intention (Proposition-2). With the initial trust between participants, there would be less perceived risk for the failure of transaction, which can reinforce the purchase intention. Finally, in the presence of BCT, the intermediaries' influence can

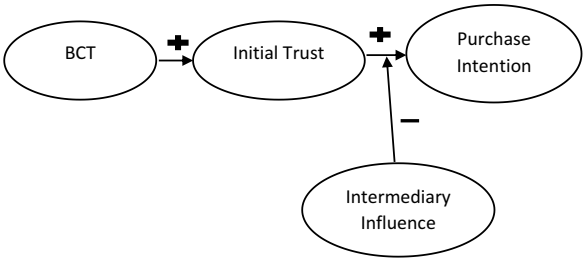

Figure 1. Proposed model for future research .

be insignificant for trust and purchase intention (Proposition-3). The traditional role of intermediaries in the pre-owned marketplace was to mediate the transaction. Intermediaries remove the hassle of finding a buyer/seller. Primarily, participants preferred intermediaries as there is no source of trust, especially in the context of digital media and high involvement purchases. With a technological alternative (BCT) available, the current role of intermediaries can possibly diminish.

5. Theoretical implications

By applying the theoretical constructs of the RBV theory and the TBMT, this study sheds light on developing triple perspectives of current challenges in pre-owned automobile transactions, the scope of blockchain in pre-owned automobile transactions, and concerns regarding blockchain adoption in pre-owned automobile transactions (Madhani, 2010; Tandon et al., 2021). This study enriched blockchain literature in the context of pre-owned automobile industry (Dubey et al., 2020; Nigam et al., 2022).

Further, we could also use the theory of swift trust discusses trust formation between parties within a short period (Blomqvist & Cook, 2018; Sangal et al., 2022). When buyers and sellers transact with multiple individuals, they need to build trust quickly between them to complete the transaction. Using BCT can aid swift trust formation as information is provided in a trustworthy and reliable manner (Dubey et al., 2020).

6. Managerial implications

This work has several implications for managers. Every time a new technology is adopted, the existing equilibrium will be disturbed. BCT will affect sectors where information asymmetry is greatest (Farsi et al., 2018). Managers of websites such as OLX (marketplace) should welcome the adoption of blockchain by the automobile sector. If the automobile sector adopts BCT, the ads listed on such websites will have a significantly higher level of trust embedded in them. Both buyers and sellers on the platform would feel comfortable in taking the transaction forward (Farsi et al., 2018). This will further allow buyers and sellers located in geographically apart locations to transact with each other with confidence (Dubey et al., 2020). It may be possible that the buyers and sellers can complete the whole transaction digitally without meeting in person with BCT adoption. Websites, such as OLX, could use such opportunities to move to a paid (subscription) model using the network effects and huge user base they have gathered over the years. Given the inherent bidding in such trades, with transparency and trust the users would find it convenient to bid online. BCT would allow buyers to assess a fair value, but it will not stop them from bidding more than others (Dubey et al., 2020).

Pre-owned automobile aggregators would need to adapt to the changing technological environment (Reddy et al., 2021). The business of automobile aggregators can go to marketplace websites such as OLX. With the increased trust, buyers and sellers would like to cut down the commission that aggregators take away due to information asymmetry. On the positive side, the aggregators can extend their business model. With BCT adoption, transactions can happen even when buyers and sellers are located at geographically

separate cities. With adequate information, they may prefer to complete the transaction digitally. At this stage, the need of shifting the automobile from seller to buyer, servicing the automobile as per the need of the new buyer, etc., may arise. Thus, by providing such services, automobile aggregators may expand the scope of their business as BCT gets adopted by the pre-owned automobile sector (Chan et al., 2014).

7. Conclusion, limitations, and future research directions

The findings of this exploratory study show that in a promising pre-owned digital automobile market, despite the rapid digital transformations, growth is plagued by issues majorly based on trust (information asymmetry). Consequently, information asymmetry in the pre-owned market can be reduced if BCT is used to track a product's life cycle. With proper documentation through BCT, the traditional intermediaries' roles will be significantly reduced and they might need to reorganize their business practices. Overall, BCT can appear as a valuable resource for the pre-owned automobile market as a whole, especially in emerging economies.

Our study is conducted in an emerging economy where information asymmetry exists for selling and buying of pre-owned automobiles. In other economies, the norms may be stringent and the volume of information asymmetry may vary. Further, digitization is being adopted rapidly and more automobile-related documentation work is carried online. It is possible that after a few years, the information asymmetry may be reduced even without BCT adoption. The cumulative benefit due to the adoption of BCT may be less as compared to the cost incurred in the adoption of BCT. Another possible limitation of our study is the use of qualitative study procedure. Though qualitative studies are useful in generating key insights, the results may not be generalizable with non-probabilistic sampling.

A major limitation that we see from the application perspective of our findings in the success of BCT in pre-owned markets in emerging economies like India is due to network externalities. Pre-owned automobile industry is majorly fragmented. Unless the industry as a whole adopts BCT, the effectiveness of such a technology in enhancing trust can be limited. All participants in this industry may not be equally enthusiastic in adopting BCT. Such an adoption may need intervention from regulatory authorities that can enforce such an adoption of technology.

We suggest that researchers should use the mixed method approach or use insights from our study and perform quantitative studies to generate generalizable insights in future. We encourage researchers to conduct a similar study in different economies to explore the scope of BCT in the pre-owned automobile segment. We also suggest researchers to examine the scope of BCT in other pre-owned product categories. It is possible that in some product categories (e.g. low involvement products), the value addition via BCT may not be significant to justify its adoption. Finally, an interesting area of research is to see the difference between consumer-to-consumer and business-to-business transactions for pre-owned automobiles.

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Appendices

Appendix A

Focus Group and Interview participants

Code	Gender	Age	Occupation	Code	Gender	Age	Occupation
Past Seller (pre-owned vehicle) FGD-1				Current Seller (pre-owned vehicle) FGD-2			
F1P1	M	30	Engineer	F2P1	F	34	IT
F1P2	M	27	Manager	F2P2	F	28	Student
F1P3	M	33	Manager	F2P3	M	31	Faculty
F144	M	25	Manager	F2P4	M	24	Engineer
F1P5	M	39	Engineer	F2P5	M	37	Engineer
F1P6	M	21	Accountant	F2P6	M	39	IT
F1P7	F	32	Faculty	F2P7	M	27	Manager
F1P8	M	28	Student	F2P8	M	28	Manager
Past Buyer (pre-owned vehicle) FGD-3				Current Buyer (pre-owned vehicle) FGD-4			
F3P1	M	23	Manager	F4P1	M	29	Engineer
F3P2	M	27	Manager	F4P2	M	26	Engineer
F3P3	F	36	Homemaker	F4P3	M	35	Faculty
F3P4	F	37	Engineer	F4P4	M	37	Accountant
F3P5	M	31	Engineer	F4P5	M	40	Manager
F3P6	M	30	IT	F4P6	M	40	Manager
F3P7	M	34	Manager	F5P7	M	30	Student
F3P8	M	26	Manager	F6P8	F	32	Student
Past Seller (pre-owned vehicle) FGD-5				Current Seller (pre-owned vehicle) FGD-6			
F5P1	M	37	Manager	F6P1	F	34	IT
F5P2	M	31	Manager	F6P2	F	28	Student
F5P3	M	30	Engineer	F6P3	M	37	Faculty
F544	M	25	Engineer	F6P4	M	31	Doctor
F5P5	M	25	Engineer	F6P5	M	30	Engineer
F5P6	M	37	Accountant	F6P6	M	39	IT
F5P7	F	40	Doctor	F6P7	M	27	Manager
F5P8	M	28	Student	F6P8	M	28	Manager
Past Buyer (pre-owned vehicle) FGD-7				Current Buyer (pre-owned vehicle) FGD-8			
F7P1	M	31	Manager	F8P1	M	29	Engineer
F7P2	M	24	Manager	F8P2	F	26	Doctor
F7P3	M	37	Lawyer	F8P3	F	31	Faculty
F7P4	M	30	Doctor	F8P4	M	24	Accountant
F7P5	M	34	Engineer	F8P5	M	37	Manager
F7P6	M	26	IT	F8P6	M	37	Manager
F7P7	F	34	Student	F8P7	M	40	Lawyer
F7P8	F	26	Student	F8P8	M	32	Student
Interviews with pre-owned automobile online/ omnichannel retailers (aggregators)							
IP1	M	43	Manager				
IP2	M	37	Manager				
IP3	M	44	Manager				
IP4	F	37	Manager				
IP5	M	51	Manager				

Appendix B

FGD Moderator Guide (Buyer/Seller of pre-owned automobiles)

Dear participants, thank you for your consent to participate in this study. As communicated earlier, we will discuss your purchase/selling experience for pre-owned automobiles. We will focus on your experiences on digital channels, but we also welcome you to share your experiences with traditional offline channels. We will cover both direct customer-to-customer and customer-to-intermediary transactions *(clarify what we mean by customer-to-customer and customer-to-business/intermediary channel).*

Please ask if there is any confusion.

Can we video record the discussion before we start? We promise to use the data collected only for academic purposes, and your confidentiality will be maintained at all times *(make sure the recording is on after taking consent and before the discussion starts)*

(1) Let us start with a brief round of introduction. I would request all the participants to introduce themselves and also tell what vehicle they *[have sold/purchased in the past] [are looking to purchase/sell currently] (A brief general introduction)*
(2) Thanks for that introduction. Let us now discuss the reason for selling/purchasing your pre-owned vehicle.
(3) How did you plan to buy/sell a pre-owned vehicle? (*Look for specific details (examples) during the discussion. What were/are the different sale/purchase channels considered? Which channel was selected and why? Etc*.)
(4) For those who chose to sell/purchase directly (customer to customer), how was your experience? *(Ask to elaborate with examples).*
    (a) Did you face any challenges? *(Ask to elaborate with examples).*
    (b) How would you think your experience could have been better? *(Ask to elaborate with examples).*
    (c) Do you think going the other way (sell/purchase via an intermediary) would have been more satisfying?
(5) For those who chose to sell/purchase indirectly (via intermediaries/pre-owned vehicle dealers), how was your experience? *(Ask to elaborate with examples).*
    (a) Did you face any challenges? *(Ask to elaborate with examples).*
    (b) How would you think your experience could have been better? *(Ask to elaborate with examples).*
    (c) Do you think going the other way (sell/purchase directly) would have been more satisfying? *(Ask to elaborate with examples)*
    (1) Those who sold C2C and B2C, do you think going the other way would have been more satisfying?
    (2) Based on the channel you selected (digital/offline channel), how satisfied were you post your transactions? *(Ask to elaborate with examples)*
    (a) How would you think your experience could have been better? *(Ask to elaborate with examples)*
    (b) Do you think taking the other channel would have been a better choice? *(Ask to elaborate with examples)*

Summarize the complete discussion to this point and ask if anyone has anything to add.

(6) Now, we will discuss the role of a new technology – Blockchain. Has anyone in this group heard of Blockchain before? *(Ask to elaborate with examples)*. For the benefit of all the participants, let us watch some brief non-technical YouTube videos on this technology before moving ahead. (*Once the participants have watched the videos have a small discussion on Blockchain. Ensure that all the participants have a basic understanding of Blockchain)*.
    (a) Do you think that if the automobile industry adopts blockchain technology (BCT), your decision-making will be influenced? *(Ask to elaborate with examples)*

(b) How would you feel dealing at the customer-to-customer level if the automobile industry adopts BCT? *(Ask to elaborate with examples)*
(c) How would you feel about taking the digital route for transacting pre-owned vehicles if the automobile industry adopts BCT? *(Ask to elaborate with examples)*
(d) How would you feel dealing at the intermediary (business) to customer level if the automobile industry adopts BCT? *(Ask to elaborate with examples)*

Summarize the discussion on BCT and ask if anyone has anything to add.
Thank the participants for their time and provide them with information about the lucky draw.

Appendix C

Questions for PI – Managers operating in pre-owned automobiles as respondents

Dear participants, thank you for your consent to participate in this study. As communicated earlier, we will discuss how technological advancements have made and can make your business process of transacting pre-owned automobiles easier/difficult. We will focus on your experiences on digital/omni channels, but we also welcome you to share your experiences with traditional offline channels.

Please ask if there is any confusion.

Can we video record the interview before we start? We promise to use the data collected only for academic purposes, and your confidentiality will be maintained at all times *(make sure the recording is on after taking consent and the interview starts)*

(1) Let us start with a brief round of introduction. Please introduce yourself along your line of business. *(Ask for details, like how long she has been in the industry, what firms she has worked for, and at what levels, etc.)*
(2) Please can you elaborate more on your business format? How do you deal with pre-owned vehicles?
   (a) *Ask for details seeking how the vehicles are transferred from the current owner to the new owner.*
   (b) *Ask the manager to elaborate on the complete cycle a pre-owned vehicle owner goes through when she plans to sell the vehicle to the manager firm.*
   (c) *Ask for details regarding how the managers' firm evaluates the pre-owned vehicle's condition.*
   (d) *Ask the manager to elaborate on the complete cycle a pre-owned vehicle buyer goes through when she plans to sell the vehicle to the manager firm.*
(3) What challenges do the buyers of pre-owned vehicles face while doing business with you? *(Ask to elaborate with examples).*
(4) What challenges do the sellers of pre-owned vehicles face while doing business with you? *(Ask to elaborate with examples).*
(5) What challenges do you face while dealing with buyers and sellers of pre-owned vehicles? *(Ask to elaborate with examples).*
(6) Can you please share your views on the current state of digital transformations undertaken by your firm? Industry overall? *(Ask to elaborate with examples).*
(7) What kind of other digital transformations the pre-owned automobile industry can take to provide better businesses to its customer? *(Ask to elaborate with examples).*
(8) Finally, I would specifically like to discuss the role of blockchain technology (BCT) in the automobile sector and specifically pre-owned automobiles.
   (Repeat the video exercise as in FGDs if necessary)

   (a) What are some of the benefits of adopting the BCT automobile sector? *(Ask to elaborate with examples).*
   (b) What are some of the benefits of adopting the BCT pre-owned automobile sector? *(Ask to elaborate with examples).*

(c) What challenges do you think your firm would face if the automobile industry adopts BCT? *(Ask to elaborate with examples).*
(d) How can pre-owned automobile firms adapt to changes brought if the automobile industry adopts BCT? *(Ask to elaborate with examples).*

Summarize the interview and ask for any additional insights the manager would like to share. Thank the respondent for his/her time and provide information about the lucky draw.

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