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Value Co-Creation in Used-Car Auctions: A Service Scientific Perspective

Safdar Muhammad Usman, Youji Kohda, Katsuhiro Umemoto

***Abstract*—**Electronic market place plays an important intermediary role for connecting dealers and retail customers. The main aim of this paper is to design a value co-creation model in used-car auctions. More specifically, the study has been designed in order to describe the process of value co-creation in used-car auctions, to explore the co-created values in used-car auctions, and finally conclude the paper indicating the future research directions. Our analysis shows that economic values as well as non-economic values are co-created in used-car auctions. In addition, this paper contributes to the academic society broadening the view of value co-creation in service science.

***Keywords*—**Value co-creation, Used-car auctions, Non-economic values, Service science.

I. Introduction

THE importance of the used-car market is growing significantly due to transparency and symmetry of information. The internet is increasingly becoming the information source of choice for used vehicle buyers and sellers. As the advent of nearly ubiquitous information infrastructures promotes the development of electronic commerce applications, new electronic market intermediaries are emerging which bring significance changes in the economics of marketing and distribution channels by interposing themselves between suppliers and consumers in electronic marketplaces [1]. These electronic intermediary services increase the efficiency for search, contract formation and trade settlement involvement with market transactions [2].

Japanese used-car auctions markets are the most successful cases of introducing information technology (IT) during the last decade. Before Internet is introduced, most Japanese used-car auctions were conducted via VAN and Satellite. Therefore, most auctions were closed and limited in domestic. However, introduction of Internet enables auctions maker to expand their service area to the whole world. Enlargement of service area means increase of members too. As a result, it is observed that IT as well as Internet extends the range of market dramatically [3].

On the other hand, service is the application of competences (knowledge and skills) by one entity for the benefit of another [4], [5]. Therefore, value co-creation is the heart of service science (SS). SS is the study of service systems and of the co-creation of value within complex constellations of integrated resources [6]. In service-dominant logic (SDL), value is always co-created jointly and reciprocally, in interactions among providers and beneficiaries through the integration of resources and application of competences [7]. In used-car auctions, values are co-created by the mutual interaction between car dealers and customers. Here, used-car auctions play an intermediary role for the interaction among consigners, dealers and customers. In the Business and Management literature, there are plenty of researches on value co-creation [4]-[6], [8], but there is no study yet develops any theoretical model for value co-creation in used-car auctions. Therefore, we will develop a value co-creation model in used-car auctions.

In this study, first of all we will describe the trends of used-car business in USA and Japanese used-car auctions as well as its proliferation with the help of IT and internet. Secondly, we design a value co-creation model for used-car auctions. Finally, we will explore the co-created values in the used-car auctions. The rest of the paper is organized in the following ways: trends of used-car auctions, Japanese used-car auctions, value co-creation model for used-car auctions, economic and non-economic value creation in used-car auctions, and conclusion.

II. Trends of Used-Car Business in USA

Table I shows the used-car sales figures in USA from 2000 to 2014. Here, we can see that the used-car industry in USA is not expected to recover to its 2007 levels and even then not quite until the 2014 calendar year [9].

TABLE I
USED-CAR SALES FIGURES FROM 2000-2014

Year	New-car sales	Year	Used-car sales
2014	41,250,000	2006	42,565,544
2013	41,000,000	2005	44,138,263
2012	40,500,000	2004	42,706,103
2011	38,792,169	2003	43,571,652
2010	36,883,987	2002	43,025,087
2009	35,589,149	2001	42,624,116
2008	36,530,404	2000	41,620,429
2007	41,418,561		

Not surprisingly, the recession played a major role in the downturn in used-car sales from 2007 to 2008. Used-car sales dropped more than 17% from calendar year to the 2008 calendar year. The number then dropped again in 2009 another million used vehicles or so before beginning to recover in 2009. Over the three calendar years from 2009 to 2012, used-car sales

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jumped more than 14%. Because turned to use used-cars instead of buying new cars because of the better values, better vehicles and strong certified pre-owned programs.

It is worth mentioning that Manheim is the world's leading auto auctions in the world. It is operating 106 locations around the globe. Manheim handled nearly 8 million used-cars, facilitating transactions representing more than $50 billion [10].

III. Trends of Japanese Used-Car Business

Japanese exported 661,645 used-cars among top ten countries in the world in the year of 2013[11]. Table II shows the top ten countries importing Japanese used-cars.

TABLE II
TOP TEN COUNTRIES IMPORTING JAPANESE USED-CARS

Rank	Country	Number of used-car exported
1	Russia	158,020
2	New Zealand	87,529
3	Myanmar	79,296
4	Chile	71,071
5	UAE	69,830
6	South Africa	49,370
7	Kenya	51,944
8	Kyrgyz Rep	35,992
9	Mongolia	32,910
10	Pakistan	25,683
	Total	661,645

According to USS Co. Ltd., as of May 2014, the used-car exports increased 16.6% to 1.19 million units. USS Co. Ltd. [12] shows that Africa, Russia, Myanmar and UAE are the major destination countries of Japanese used-cars and Georgia, Sri Lanka, Bangladesh, Mongolia, Malaysia and Philippines are countries with large increases of Japanese used-car exports. Table III depicts the major destination countries and countries with large increases of Japanese used-car exports.

TABLE III
MAJOR DESTINATION COUNTRIES WITH LARGE INCREASES OF JAPANESE USED-CARS

Countries	Number of cars	Ratio of increase
Africa	265,000	Up to 19.6%
Russia	159,000	Up to 9.6%
Myanmar	132,000	Up to 3.4%
UAE	106,000	Up to 24.0%
Mongolia	34,000	Up to 10.3%
Malaysia	26,000	Up to 10.3%
Philippines	26,000	Up to 8.4%
Georgia	22,000	Up to 134.2%
Sri Lanka	19,000	Up to 139.7%
Bangladesh	15,000	Up to 99.2%

IV. Japanese Used-Car Auctions

Used-car auctions are the most efficient intermediary in the used vehicle distribution market, with a transparent system of vehicle inspections and commission. In this section, we will discuss about the share of Japanese used-car auctions market, used-car auctions business model, types of used-car auctions, and process of used-car auctions.

A. Share of Japanese Used-Car Auctions Market

There are 144 used-car auctions in Japan, which serves as intermediaries for used-car transitions between dealership [13]. In Japan, USS is the biggest used-car auction company, AUCNET is the pioneer of electronic auction, and JAA is the first POS (point-of-sales) adapter [3]. According to USS Co. Ltd. [12], USS has the largest share (31.8%) in auto auction market followed major six companies (35.7%) and others have 32.5% share in the auto auction market in Japan. Fig. 1 shows the market share of auto auction in Japan.

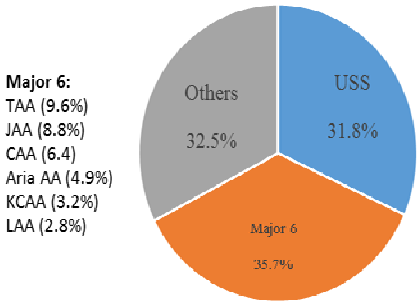

Fig. 1 Market share of auto auction in Japan

B. Business Model of Japanese Used-Car Auction

Fig. 2 shows the Japanese used-car business model. Usually, Japanese used-car auction generates profit from consignment fees, contract completion fees, and successful bid fees from members consigning vehicles and members submitting successful bids. Here, members consigning vehicles put used cars to auction and the get payments for vehicles. On the other hand, members submitting successful bids pay to auction for purchasing of the used-cars.

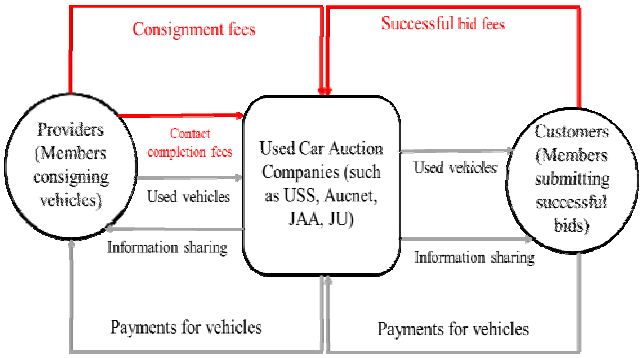

Fig. 2 Business model of Japanese used-car auctions

In the used-car business, used-car auction companies share information with providers (members consigning vehicles) and customers (members submitting successful bids). As Akerlof [14] introduced the "lemons" model assumed that owners of used-cars have an informational advantage over potential buyers with respect to the quality of their vehicles.

C. Services of Japanese Used-Car Auctions

There is no magic formula behind the success of Japanese used-car auctions. Rather, it is based on providing auto auction users the maximum choice and convenience for the minimum cost. Usually, Japanese used-car auctions provide "on site", "via satellite" or "over the internet or virtual auction" for their members. In addition, they provide proxy services, retail services, online auction bidding, membership magazine, and cutting age financial service. Moreover, they also provide email notification service, automatic land transport arrangement service, confirmation of calculation sheets and documents, customer attraction support seminar, auction warranty, deferent payment service, sharing inspection information, trading-in of automobiles for using and recycling, and inspection case site. They also provide support services from inspectors, salesperson, and help desk and so on. Finally, they also provide consultancy services and voices from members.

D. Participating Ways of Japanese Used-Car Auctions

There are many used-car auctions in Japan which include independent company auction (NDAA, SAA), manufacture/dealer/rental auctions (TAA, ORIX, SUAA, SAA, HAA, and NAA), auction groups (USS group, JU group and ARAI group), and online/satellite auctions (AUCNET, ASNET, GAO! And HERO) [15].

Usually, there are three ways to take part in used-car auctions: "on-site", "via satellite" or "over the internet". **On-site:** used vehicles consigned to on-site auctions operated nationwide are auctioned once a week. Members can take part in worry-free bidding at on-site auctions, choosing from a wide-range of models and ages, since members can actually conduct preliminary inspections of the consigned vehicles. **Satellite auctions (Global network)**: members can take part in auctions at different auction companies' on-site auctions and different affiliated auctions sites across the Japan by using terminals exclusively for satellite. Members can obtain information about vehicles in advance from their offices. They can also check specific details about the vehicles they are interested in by utilizing "preliminary inspection agent service". **Internet or Virtual auctions (Internet Live)**: The internet has made it possible for members take part in auctions held at on-site auctions. Participants can check quotation information displayed on the PCs before auctions and preview the vehicle's details. Members that have put their vehicles up for auction can check the progress of bidding in real time [12].

E. Process of Japanese Used-Car Auctions

Fig. 3 shows the transaction process of Japanese used-car auctions. Specially, this process is adopted from steps in a USS auto auction. But Lee [16] described the eight steps market transaction process of AUCNET including consignment application, vehicle auction, image and data input, catalog editing, catalog transmission, preview by dealers, electronic auction and post auction administration.

In USS, vehicle storage, inspection, vehicle registration, and storage/preliminary search are done by the day before auction. **Vehicle storage**: vehicles to be auctioned should be transported to auction site the day before auction.

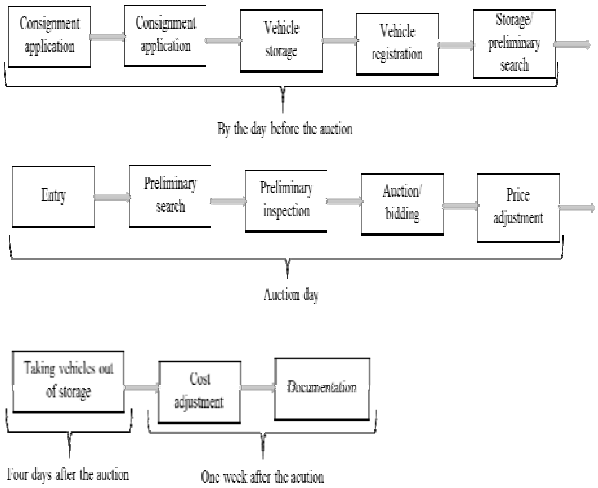

Fig. 3 Steps in USS auto auction

Inspection: inspectors impartially grade vehicles in line with 10-grade evaluation standards. **Vehicle registration:** They photograph the vehicles and put the photographs in databases along with the results of their inspection. **Storage/preliminary search:** they carefully store vehicles to be auctioned, and these vehicles are open to inspection by their members. Members can also preview the vehicles using satellite terminals or over the internet [12].

Entry, preliminary search, preliminary inspection, auction/bidding, and price adjustment are done on the auction day. **Entry:** USS uses ID cards to check members when enter or leave auction site. **Preliminary search**: to search for the vehicles they have in mind, members can access database using the information terminals installed in the auction sites. **Preliminary inspection**: members can avoid any potential problems that might occur after successfully bidding for a vehicle, by preliminary inspecting the vehicles stored in auction sites. Members who participate in auction via satellite or over the internet can request a "Preliminary Inspection Agent Service". **Auction bidding**: cars are arranged in different corners of auction sites, and auctions are simultaneously held for between two and six vehicles. It takes about 20 seconds to complete a contract for one vehicle. Members can make "limit bids" or "direct bids" using satellite terminals or the Internet. Price adjustment: members can adjust the starting price and hiding prices for vehicles they put up for auction, while taking in the atmosphere of the auctions held that day [12].

Four days after the auction, usually members have to take out vehicles of storage. USS follows various procedures to take sold vehicles out of storage. In this case, members can use their own transport or they can take transportation services from the auction companies as well.

One week after the auction, members have to do cost adjustment and documentation. **Cost adjustment:** the buyer pays the auction company the amount of the successful bid plus a successful bid fee and Auction Company then passes the amount of the vehicle's winning bid on the seller, after

deducting a commission and a contract completion fee. Documentation: the seller gives Auction Company an automobile inspection certificate, an ownership transfer certificate and a certificate of their seal impression, and Auction Company then hands over these documents to the buyer after confirming that buyer has paid the amount of the successful bid.

V. Value Co-Creation Model in Used-Car Auctions

Value co-creation is the prime concept of SDL. Electronic intermediaries or auction site or relationship play an important role for co-creation of values in used-car auctions. In used-car auctions, members consigning vehicles (providers) interact with members submitting successful bids (customers) via the auction site or satellite auction or internet (electronic or viral) auction and propose values. Usually, this is a B2B (business-to-business) system and the key success factor is a combination of "institutionalized appraisals by consigning vehicles" and "online inspection of the appraisal results before auctions by members submitting successful bids".

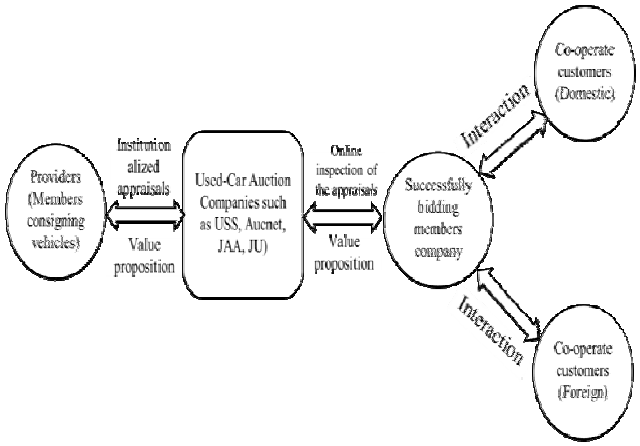

Fig. 4 Value co-creation process in used-car auctions

Moreover, "the members, who are submitting successful bids" have their own customers, and also have their own needs for used-cars. Therefore, the biding decision or conditions for "the members who are submitting successful bids" are different from members to members. For example, the members who have domestic customers want to buy rather expansive and good condition cars, whereas the members who have foreign customers purchase cheap and reasonable condition cars. In the case of domestic customers, they directly interact with members submitting successful bids and purchase their desired cars. On the other hand, foreign customers also interact with members submitting successful bids though internet or over telephone or other kinds of communication Medias for their desired cars. Through this way, the whole process co-creates values in the auctions of used-cars. Fig. 4 shows the process of value co-creation in used-car auctions.

In Section IV, we discuss about the participating ways of Japanese used-car auctions. There are three ways to take part in used-car auctions including "on-site", "satellite auctions" and "internet or viral auction". These three ways of participating in used-car auctions play the important role for interaction with customers and providers that ultimately propose values. In on-site auctions, members can interact with each other and take part in worry-free bidding, choosing from a wide-range of models and ages, since members can actually conduct preliminary inspections of the consigned vehicles. In satellite auctions, members can take part in auctions at different auctions companies' on-site auctions and different affiliated auctions sites by using terminals. Through the preliminary inspection agent service, members can interact with diverse network of members. Here, satellite auctions also act as an intermediary for interacting with each other.

Finally, in internet or virtual auctions (internet live), members can take part in auctions and check quotation information displayed on the PCs before auctions and preview the vehicle's details. In addition, members can check the progress of bidding in real time. Usually, members can use and search of huge database of the auction companies. In general, car auction companies use very sophisticated software for their members. Here, AUCNET is first used software used for viral auction in Japan. AUCNET was introduced in 1985 by an entrepreneurial used car dealer, who foresaw that the redesign of the auto auction business using computers and advanced communication technologies would significantly improve the market where efficiency of used-car transactions [14]. Currently, AUCNET used virtual auction, shared inventory market, ICHIGEKI market, live auction link, i-Auc, and self-purchase [17]. Similarly, JAA also has database service. Customer can view JAA's auction data at real time through JAAWEB. In addition, the Japanese used-car auction giant USS use Car-Bank-Net for vehicle information. They use CIS (Car Quest) for customer supports. Through this way, internet or viral auction plays the intermediary role for proposing values in used-car auctions.

Different kinds of values are co-created through interactions between customers with used-car Auction Company and providers with the used-car auction company in used-car auctions. In used-car auctions, economic as well as non-economic values are co-created. Economic values such as consignment fees, successful bid fees, and contract completion fees are co-created in used-car auctions. Non-economic values such as networking, justice, regional development, environmental value, power, speed and loyalty are also co-created in used-car auctions. Economic and non-economic values are enumerated in Section VI.

VI. Economic and Non-Economic Values Created in Used-Car Auctions

Table IV shows the co-created economic and non-economic values in used-car auctions as a result of value co-creation process (see Fig. 4). Here two types of values have been observed. Firstly, the economic values in terms of selling used-cars, consignment fees, contract fees, successful bids and risk's reduction. Usually, used-car auction takes risk in terms of giving warranty for their customers and this ultimately generate values to the used-car auctions. Secondly, non-economic values

including networking, justice, regional development, environmental value, power, speed, and loyalty are co-created in used-car auctions.

TABLE IV
ECONOMIC AND NON-ECONOMIC VALUES IN USED-CAR AUCTIONS

Values	Sub-values
Economic values	Selling of cars
	Consignment fees
	Contract fees
	Successful bids
	Risk's reduction
Non-economic values	
Networking	Cooperation
	Sharing
	Partnership
Justice	Equality
	Respect
	Trust
	Confidence
Regional development	Citizenship
	Relationship
	Civic engagement
	Community connectedness
	Intellectual
Environmental value	
Power	
Speed	Advanced communication
	Network
Loyalty	

In general, used-car auctions play an important role for generating non-economic values. Three are many non-economic values are co-created in used-car auctions. However, some important non-economic values are described here.

Firstly, networking is one of the prime values co-created in used-car auctions. Network is generated through the cooperation, sharing and partnership with other used-car auctions. Usually, used-car auctions have made network with independent auction company (NDA), manufacturer/dealer/rental auctions (TAA, ORIX), auction groups (USS group, JU group and ARAI group) and online auctions (AUCNET, ASNET and HERO). These networks of used-car auction companies make a global network that provides access to their customers for ease search and use of ample databases. In this way, anyone can participate in the used-car auctions in anywhere in Japan. Even though, members who stay outside of Japan can participate in the auctions in real time.

Secondly, justice is another important non-economic value co-created in used-car auctions. Justice involves in confidence, trust, respect and quality. With used-car auctions, it is important to win the confidence of the members by boosting both the number of vehicle consignments and the numbers of completed contracts. Firmly bearing in mind the tenet that used-car auctions should simply be for end users, used-car auctions continue to establish standard market price for used vehicles, thus gaining the trust of consumers. In addition, used-car auctions continue to respect its employees, and are stepping up its efforts to establish an environment where they can maximize their capabilities.

Thirdly, regional development is another important value co-created in used-car auctions. Regional development is done through the civic engagement, citizenship, community connectedness, relationship and intellectual freedom. Citizenship occurs when one becomes responsibly connected to the community or society in which one resides by actively working towards change to benefit other through care, service, social responsibility, and community involvement. Through proactive mutual exchanges with local communities used-car auctions continue to contribute to regional development as a good corporate citizen.

Fourthly, another important co-created value in used-car auctions is the environmental protection. As an effective use of resources as well as a means for an environmental protection, end-of-life vehicles recycling attractions more customer attention. Therefore, used-car auctions have determined to tackle the environmental problems by focusing on reusable vehicle auctions and stimulating the distribution market of older vehicles with high mileage.

Finally, power, speed and loyalty values are co-created in used-car auctions. To support nationwide and international-wide distribution of used-cars, used-car auctions hold lively auctions with the speedy, power and network. In addition, satisfied buyers are more likely to buy more vehicles from the auctions that ultimately show the loyalty of the customers.

VII. CONCLUSION

This descriptive study provides insightful information about used-car auctions in Japan. In addition, this study also broadens the view of service science in used-car auctions. First of all, this study shows used-car business in USA, Japanese used-car business, and used-car auction process. In used-car business, usually dealers, buyers and sellers take part in auctions through "on-site", "satellite" or "internet or virtual". These three ways play an important intermediary role in used-car auctions. In addition, these three also facilitate the interaction among dealers, buyers, and sellers that ultimately co-create values in used-car auctions.

In addition, it is a great opportunity to broaden the view of value co-creation in service science. As per the in used-car auctions, not only economic values are co-created but also non-economic values such as networking, confidence, trust, respect, regional development, and environmental protection are co-created. That is why, this research denotes an innovative area in both customer and service research that can be subsidized to understand and reduce the stimulating problems facing by the today's society. In this connection, we hope that it will be a frontier for additional service scientific research dedicated to the problems related to dealers, buyers, and sellers' well-being in used-car auctions.

There are several limitations of this study. First, this is a conceptual research based on literature as well as other secondary sources. Therefore, further qualitative and

quantitative research should be carried out justify the interaction among dealers, buyers and sellers in used-car auctions. Second, the value co-creation model is also based on our understanding through comprehensive review of literature. So, future case study or qualitative study should be conducted to verify the value co-creation model in used-car auctions. Not last but least, the explored co-created values is also based on literature review and secondary sources; therefore, further study is needed to justify these co-created values.

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