

Optimizing Multiple Performance on e-Commerce Trading Platform

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Abstract—The prosperous development of e-commerce, customized products have gradually become an important part of online transactions. In recent years, various recommendation systems have been developed by e-commerce platforms to facilitate commodity selection orders and thus improve the transaction efficiency. Many famous e-commerce enterprises, such as eBay and Alibaba, have launched online auction services. On the other hand, the internet has had a profound impact on how trading systems such as auctions are operated. In the research, the grounded theory was used to analyze data and develop the schemas from auctioneers and e-commerce users. The research used three times longitudinal interviews for collecting data from e-auction and e-commerce users separately. And, the period of interval was five to six weeks. The need for cognitive closure can be understood as a desire for quickly making a decision. In order to better understand the differences between their strategies.

Keywords—*Schema; e-auction; e-commerce; Grounded theory; online fraud; online transactions*

I. INTRODUCTION

The use of electronic commercial services has increased dramatically since its inception in 1990. With the rise of the Internet, online sales become important channel for e-tailors. The business environment change has influenced business operations and resulted in the electronic commerce promotion [1]. Besides, with the popularity of online auction marketplaces growing, the online auction has become remarkably and as efficiently trading floor for consumers [2]. Theoretical work on auction strategies, auctioneers may use a strategy to determine the maximum amount they are willing to pay, and then they will implement the strategy by just waiting for the price to drop to the selected amount [3].

Generally speaking, when we consider the difference between e-Commerce and e-auction are the former sales new goods and the latter sales second hand. But in Taiwan, there are also have many e-shop sales new goods in e-auction website. So, it is no doubly, e-auction website competes with e-commerce website. What is the difference between these two

groups? Understanding online consumers' behavior is important in today's digital economy [4], because e-auction and e-commerce users' preferences, behaviors, and interaction with the system are critical links to e-auction and e-commerce websites survival. The purpose of this study was to find out the optimal management strategy for e-auction and e-commerce websites themselves.

II. LITERATURE REVIEW

A. Online Auction

Traditionally, sellers offered their products offline, in auction halls; today, however, products can be sold simultaneously in not only online and offline auctions but also online and offline posted-price channels [5]. The online auction markets skyrocket in recent years (Yang et al. 2007), and there are millions of globally dispersed consumers now engage in bidding to reflect real-time supply and demand. For example, eBay, which serves 24 international markets, reported with 221 million users registered. In addition, the online auction market size is estimated to grow at a CAGR of 12.36% between 2023 and 2028. The market size is forecast to increase by USD 3,076.64 million [6].

With the rapidly growth online auction markets, fraud is also rise from \$895 in 2004 to \$1917 in 2005 [7], and it has steady increase in the e-market as a prominent barrier in the digital economy [8, 9]. Online auction fraud happens both during and after auctions. According to Internet Fraud Complaint Center reported, there are 62.7 percent of fraud complaints were directly related to auction fraud in 2005, and 71 percent of all consumer complaints were related to Internet auction fraud.

Online fraud is not limited to sellers, but there are plenty of fraudulent buyers too [10]. Under the uncertainty of online transactions, trust has been recognized as the foundation in the computer-mediated environment. Trust is an expectation as appeared within a group with regulated, honest and cooperative behavior. The exchange of economics mainly exists due to the trustfulness among people [11]. Since online auction markets are interacting with strangers, thus, promoting trust between buyer-seller relationships are the critical issues [7, 12]. While online auction researchers focus on reputation system [13-15], bidding price [16], website design [17], and price premiums [18], the impact of consumer's psychological

decision-making factors toward online auction are limited [19].

B. e-Commerce

Online users increasingly use the Internet but do not normally use it for direct purchasing of products [20]. Undoubtedly, appropriate attitude toward Internet is critical for e-business success [21]. Therefore, well understanding online users' incentives to shop online is good for e-business development.

The study by Shang et al. [20] found that people had a cognitive absorption experience on Internet would like to shop on-line. If by giving customer incentives at their first-time purchase online may be is a big help for inexperienced customer to accept purchasing electronically. Internet allows customers become more efficient in their buying process in the digital environment with less required effort.

III. RESEARCH METHOD

The schema concept was initially introduced by Frederic Bartlett (1886–1969). Schema is a psychology and cognitive science which combined with people's mental structure. People use their own schema to organize current information and provide a framework for future understanding.

Schema is an effective tool for understanding people's thought. Through the use of schema, people can quickly organize new perceptions into their own schema and act effectively [22]. It is considered to be grounded on past experiences and provides an account for the knowledge in long-term memory, as the form of mental representation used for generic knowledge.

Many researchers suggested that relevant knowledge should be activated before reading. When new information was provided to an individual's schema, it is easily remembered and incorporated into people's perception. However, if the new information does not people's schema, it is possible the new information only simply ignore or quickly forget.

4. Data Collection

To collect information by in-depth interview (Marshall et al., 1995; Platt, 2002) is the most common data collection method in qualitative research, which the rich and correct information can be obtained, and the interviewers thought, attitude and feel to the real world can be understood.

In this study, 4 interviewers (three male and one female, the education degree are one senior high school and three University, age is one under 18, and another three are from 19 to 35) who prefer e-commerce to e-auction, we named it group 1). and another 4 interviewers (two male and two females, the education degree are ne senior high school, one college and two University, age is from 19 to 35 who prefer e-auction to e-commerce, we named it group 2) were invited for the in-depth interview separately before going into experiment so as to understand their

cognition status before the experiment (time T1). The study has set an interview cycle of 5 weeks so as to trace the development of the cognition model in order to keep the interviewers from remembering the previous questionnaire [23].

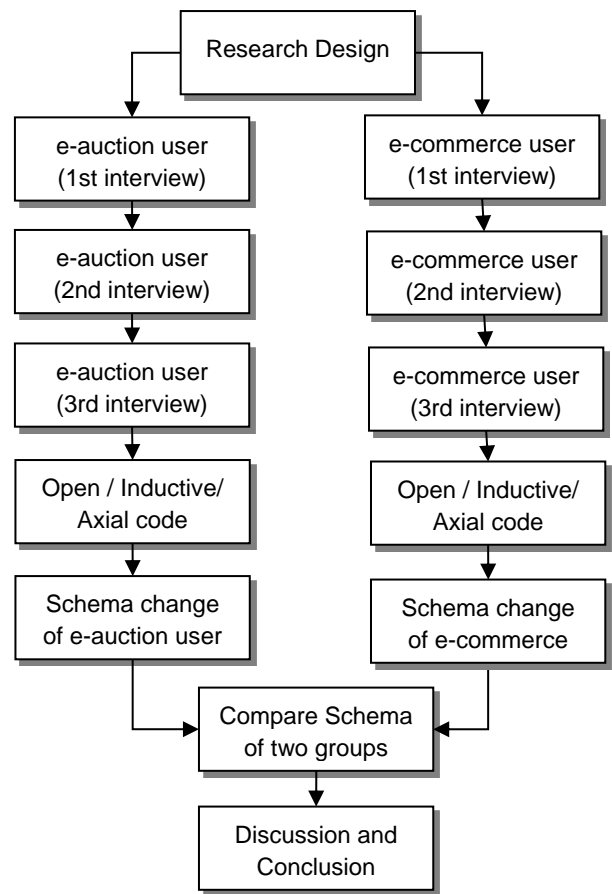


Fig. 1. Research Flow

After the end of the interview, all interviewers were requested to use the website they prefer in the next 10 weeks in buying goods; they were also informed to be in-depth interviewed again at the fifth week (time T2) and the tenth week (time T3) respectively by taking records of interviewers' cognition changes along with the time goes after accessing online-auction or online purchasing. The topics of interviewing are as follows:

- Background/demographic

Knowledge: how much and what did your knowledge of trade on internet increase during the past 5 weeks?

Experience/ behavior: such as, what is the most impressed matter when transacted at internet?

Opinion/ value: such as, what problems do you think there when browse or trade on internet? How to solve them?

Feeling: such as, what effect did it occur to your life style since use internet transaction? (friends making, knowledge obtaining or purchasing)

The transcription of the information as collected by in-depth interviews has been adopted open into key-

word (Schema), and then categorized the similar open coding according to the axial coding in order to interpret the phenomenon more accurately. This study is classified as a narrative research which is a study applies narrative story to describe human experience and behavior as mentioned by Polkinghorne [24].

IV. DATA ANALYSIS

A. The common schema of e-commerce users

After data collecting from three period interval times, the EC users' common schema is shown in Fig 2.

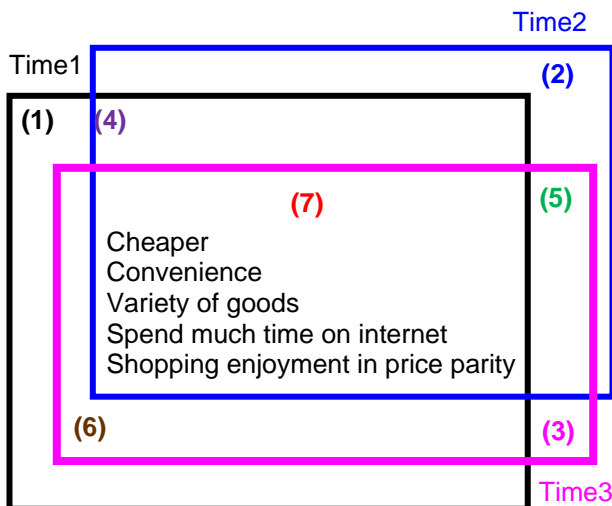


Fig. 2. The common schema of e-commerce user

The implication of e-commerce users' schema is shown in Table I. The EC user's common schema show E-commerce users spend much time in Internet for product search (Spending much time in Internet), like to compare price then choose (Like price parity), have an impression that they can see goods from difference shops at the same website (Variety of goods), consider Goods in virtual store are cheaper than physical store (Cheap price), and don't need to go outside but can buy goods, also have variety payment and delivery methods (Convenience).

TABLE I. THE IMPLICATION OF E-COMMERCE USERS' SCHEMA

Schema	Definition and Meaning
Cheaper	Cheaper than physical stores, more discount and promotion, many on-sale products, get bonus when buying lots, No transportation charges if buying 3 products
Convenience	Can use online credit card; Payment after receive goods; Express company can deliver products. Can see the various goods once, don't need to shop outdoor, can buy local inexistent products, can take produces at convenience store and not afraid of no body at home. No interest rate.

Schema	Definition and Meaning
	Can use ATM transaction, payment after delivery. Can return unsatisfy products, there are 7 days appreciation period, and guarantee is the same with physical stores.
Variety Goods	Products variety; More product information; Can understand the fashion products. Sellers will inform me to see the new arrival, information update fast and don't need to wait for DM, new products will irregular update and can know the fashion by Website. Can buy foreign products, can get products only sold on Website store or limited products
Spend much time on internet	E-commerce users spend much time in Internet for product search
Shopping Enjoyment	Enjoyment that go shopping little , can require extra gift , can is it chat , move as you like to pay with the shop assistant

B. The common schema of e-auction user

The EA users' common schema is shown in Fig 3.

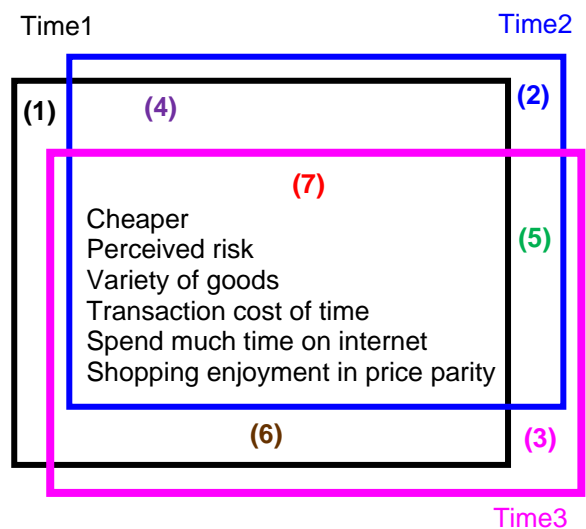


Fig. 3. The common schema of e-auction user

The implication of e-commerce users' schema is shown in Table II.

TABLE II. THE IMPLICATION OF E-AUCTION USERS' SCHEMA

Schema	Definition and Meaning
Cheaper	The price in the virtual store is cheaper than physical store; Easy to find out cheaper product;
Perceived Risk	Afraid of being deceived, letting out the personal materials, unable to know whether the goods are legal, is afraid of being usurped the account number, relatively had no guarantee to consumers easy outside. Can only see photos , afraid of the goods bought can't know the quality of the products with imagine drop, without assurance shop, afraid of buying the counterfeit product , second hand bad product , the goods are not so complete, can't try out.
Variety Goods	Can find and buy products are out of print; It is easy to compare price , variety goods can choose, click mouse can find different products
Transaction Cost of Time	Transaction process as a seven-step process including: (1) search, (2) comparison, (3) examination, (4) negotiation, (5) payment, (6) delivery, and (7) post-service, so the EA users spend more time than EC users.
Spend much time on internet	E-Auction users spend much time in Internet for product search
Shopping Enjoyment in price parity	Bidders have the feeling of exciting; Can bid with sellers, move as you like to pay with the shop assistant.

Like EC users, EA users spend much time in Internet (Spend much time in Internet), like to compare price from different products then choose (Like price parity), and consider that they run at the same auction website can see difference shops products and out of print products which are not in e-commerce website (Variety of goods), products in virtual store are cheaper than physical store (Cheap price). EA user perceived risk because of scaring the online fraud and buy the low-quality goods. Furthermore, EA users need get the goods after the bid, so they have more transaction cost of time.

In sum, EA users want to search products anytime for cheaper price. Also they would compare price, therefore, they take long time in Internet. On other hand, e-auction users like to search their favorite goods, such as out of print goods. However, people do not like online auction will feel waste time.

C. Compar the schema of EC user with EA user

From Fig. 2 we can see there are five schema cognitions from e-commerce (EC) users: (1) cheaper (2) convenience (3) variety of goods (4) spend much time in Internet, and (5) Shopping enjoyment in price parity. On the other hand, e-auction (EA) users have six schema cognitions: (1) cheaper (2) perceived risk (3) variety of goods (4) transaction cost of time (5) spend much time on the Internet, and (6) Shopping enjoyment in price parity

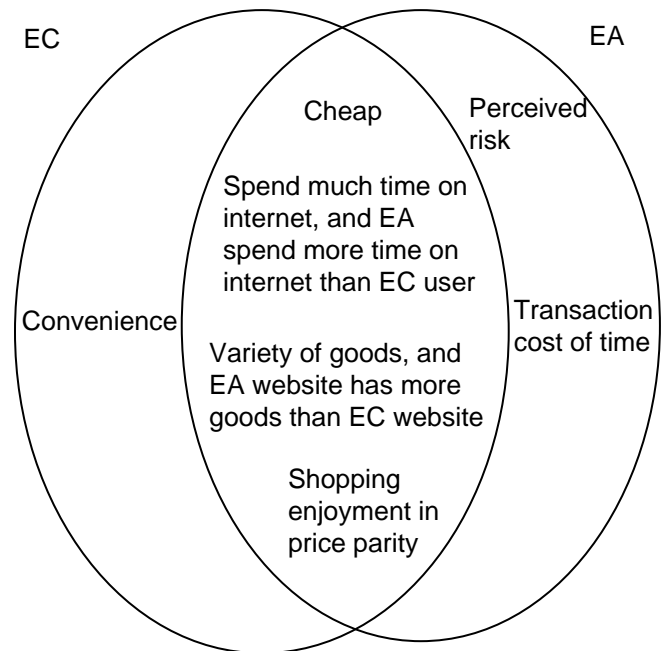


Fig. 4. e-auction and e-commerce users' schema compare from the three times interview

Obviously, comparing e-commerce users and e-auction users' schema, we find spend much time in Internet, variety of goods, shopping enjoyment in price parity, and cheap shown in both users' schema (see Fig 4). Therefore, either e-auction or e-commerce website managers want to attract more consumers; they must provide more variety and more cheap goods in their website. Importantly, how to keep users and spend more time in website is important for website management.

The EC users' schema shown it is very convenient to buy goods on EC website. Therefore, the EC website managers should pay attention to design friendly online shopping environment, such as easy to find products, variety payment and delivery method for user to choose.

Transaction costs occur in consumers' purchase decision process and affect consumers' transaction decision. Transaction process as a seven-step process including: (1) search, (2) comparison, (3) examination, (4) negotiation, (5) payment, (6) delivery, and (7) post-service (Liang and Huang, 1998). Liang and Huang (1998) pointed out the customer acceptance decision is affected by the transaction cost, but the transaction cost is affected by uncertainty. Therefore, consumers

will choose the lowest transaction cost comparing with other business channels.

Due to risk concerns, designing institution-based trust into online auction becomes an important issue. Pavlou and Gefen [25] show that institutional mechanisms influences actual online transaction activity. Especially, institution-based trust suited for online marketplaces where buyers predominantly transact with new and unknown sellers [11, 18]. In fact, many online auction marketplaces such as eBay and Amazon have established institution-based mechanisms as a means to mitigate transaction risks and build a trustworthy marketplace in order to encourage online transactions. At the meanwhile, reasonably designed feedback systems can help to promote trust and reduce risk in order to attract customers to online auction markets [18].

In spite of the perceived risk and transaction cost of time when buy goods in EA website, the EA users also spend more time in internet to compare price than EC user, because the EA websites have more goods than EC website. Therefore, the key strategy for EA website managers is providing different kinds of products in order to attract more users to shop on their auction website.

V. CONCLUSION

The research findings shown e-auction users like to search different products, and spend more time in comparing price in auction websites. Therefore, the e-auction managers should pay attention to attract more users to shop their website, also increase product variety. On the other hand, the main characteristic of e-commerce is convenience. Therefore, how to design convenience shop environment, such as easy to find goods, variety payment method, and different methods of delivery is important management strategy for e-commerce website managers.

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