Purchase decision under network environment and application of big data

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Abstract: According to the theory of traditional economics, consumers will be more rational when they make decision in the context of Internet, because they could get lots of information through the web that advance the symmetry of information. But, it is not the fact. Why would the contradiction happen? In the present paper, by the theory and literature review, we found that in the context of Internet versus tradition. Consumers are more likely to be impatient in decision-making. Consumers have more freedom and irrationality in decision-making. Therefore, consumers' network behavior is more difficult to predict.

1. Introduction
If consumers want to understand a product, they just need to type in a few keywords lightly on the web search engine, and a lot of relevant product information can be presented in front of them, which we might not have imagined 10 years ago. According to traditional economics, the more fully consumers acquire information and the more symmetrical the relative information, the more rational their behavior and behavioral tendencies should be. But the fact is far from simple. According to the data of the Internet Consumer Behavior Survey in August 2008 in the New Heng Management Research, 32.3% of Internet information browsers have no pre-purchase plan. Or under the condition of demand, affected by network information and purchasing intention. It is possible for consumers to purchase irrational products under the network environment. How to explain this contradiction theoretically will be answered from the perspective of the characteristics of rational and irrational decision-making of consumers.

2. "Rational economic man" and "limited rational man"
Traditional economic theory assumes that consumers are rational economic people. Consumers can know exactly what they need, obtain, process and use information adequately, and make rational choices according to their goals, and make rational decisions under the condition of symmetrical information. The concept of "rational economic man" is based on ideal environment and conditions, but it lacks attention to the psychological characteristics, social environment and situation of real people. In the 1980s, Richard Taylor and others, based on Simon's theory of "bounded rationality", drew inspiration from evolutionary psychology that most people were neither completely rational nor completely selfish, but related to the social environment in which they lived. In 2002, Nobel Prize winner Karniman put forward the theory of human decision-making judgment behavior and cognitive bias under uncertain conditions, which greatly advanced the theory of bounded rationality. Overall, consumers are actually more and more difficult to grasp the future information, and more and more difficult to control the situational factors. Therefore, consumers only have moderate rationality under certain conditions.
Consumer decision making process is also a process of information searching and processing. The basic goal of consumer purchase decision is still utility maximization and cost minimization. The early view holds that utility maximization is the primary goal of purchasing decision, while the recent limited rationality view holds that people's limited information processing ability restricts the realization of the goal. Because of bounded rationality, consumers often do not have the ability to evaluate all available alternatives in a complex decision-making environment. As an alternative, consumers tend to use a two-stage approach to reduce decision-making efforts. In the first stage, consumers face many kinds of products and form a large set of related products according to their beliefs and preferences, and then choose the most feasible alternative subset; in the second stage, consumers make a more in-depth evaluation of alternative subset, compare the important attributes of different products, and make a comparison. Purchase decisions.

3. The main theory of consumer decision-making process
In general, the information search process of consumers begins with internal search. Most of the information in consumer's memory comes from previous experience in products. When the information extracted from the memory is sufficient, consumers no longer search for information. When the information extracted from the internal information resources is insufficient or there is a conflict between the information in the memory, consumers search for relevant information from the outside (Li Dongjin, 2000). Internal search is carried out passively without time and cost, while external search is carried out actively in order to obtain greater search benefits under time and cost conditions.

External search is mainly through two ways: one is the source of non-marketing control information, not the source of business information. Jiang Lin (2002) divides this kind of information into Personal experience and Word of mouth information. Personal experience information, refers to the information which the consumer obtains personally, such as the information which the consumer inspects, operates or observes the product and actually uses the product obtains. Word of mouth information refers to the product related information of consumers through personal relationships. (3) Third-party organization information refers to information provided by third-party organizations other than transactions, such as inspection reports of government agencies and other non-profit organizations, professional comments or professional knowledge lectures. Second, the source of marketing control information, also known as business information sources, such information often has corporate profit intentions, such as various media advertising, exhibitions, online reviews.

The theory of consumer information search, processing and purchase decision mainly includes the following categories:

3.1. EKB model
The EKB model was proposed by Engel, Kollat and Blackwell in 1968 and revised in 1984 and 1993. The model considers that the consumption process consists of two parts: purchase decision and purchase behavior. Purchasing decision refers to the psychological activities and behavior tendency of consumers before purchasing products, which belongs to the formation process of consumers' attitude; purchasing behavior is the implementation process of purchasing decision. In real consumption activities, these two parts penetrate and influence each other and constitute a complete consumer behavior. The EKB model divides the consumer purchase decision-making process into three stages: information reception (search) information processing decision-making processing.

The information receiving stage mainly refers to the consumer gains information through the enterprise's advertising, promotion, public relations and other marketing strategies. Information processing stage refers to the processing process of consumers after obtaining information, which includes five stages: contact, attention, understanding, acceptance and retention. Consumers will selectively screen information and store it in the memory system. The decision processing stage is the core part of EKB model, which describes the whole process of consumer's purchase decision-making. It includes five stages: problem confirmation, information search, scheme evaluation, purchase choice and decision-making.
3.2. The basic mode of S-O-R theory

The stimulus response (S-R) theory was proposed by Watson in 1913. Reynolds in 1974 proposed the S-O-R theory based on the concept of psychology. S: Stimulus denotes stimulus; O: Organism denotes organism or reactant; R: Response denotes the response caused by stimulus. Based on SOR theory and consumer decision-making process, Nicosia divides the consumer behavior model into the following processes: receiving enterprise information stimulus information collection and scheme evaluation purchase decision and behavior information feedback. The Nicosia mode emphasizes the continuity of consumer purchase decisions, as shown in Figure 1.

Howard-S Heth consumer purchase behavior model was proposed by Howard and S Heth in 1969 on the basis of S-O-R theory. The model considers that behavior originates from psychological motivation and its composition includes input factors, intrinsic variables and output results. Input factors include three different stimulus factors: first, product entity stimulus factors, such as product quality, price and service; second, commercial media information, such as brand, trademark and packaging product symbol stimulus; third, consumer social environment. Intrinsic variables refer to the consumer's purchase intention, including perceptual variables and learning variables, after receiving external information or stimulation, to form product impression in the mind and through self-learning. The output result is that consumers produce certain reactions after stimulation. These reactions include arousing attention, increasing understanding, forming attitudes, generating purchasing intentions, and even triggering purchasing behavior.

3.3. ELM: Elaboration Likelihood Model.

The Elaboration Likelihood Model (ELM) proposed by Petty and Cacioppo (1986) assumes that consumers will process information along both core and peripheral routes. Route choice depends on the degree of participation and attention of consumers. If consumers have a very rational understanding of information and the ability to process information, then consumers may process information along the core line; if consumers are not rational to deal with information, do not have the ability to process information, and there is a peripheral route.

When consumers process information along the core line, their attitudes are greatly influenced by information. The core line contains three elements of attitudes: cognition, emotion and behavioral intention, but more emphasis is placed on cognition. The attitudes formed by consumers through a very rational evaluation process are likely to lead consumers to take corresponding actions. The information processing process of consumer's choice of peripheral route is more focused on the emotional aspect of attitude. Consumer's processing of information relies on those peripheral factors which have no direct connection with information content, and establishes irrational connection between these peripheral factors and brand. At this point, consumers began to exchange information, express their ways and communicate with each other. Factors such as degree of relationship will become an important factor for consumers to judge the credibility and value of information. In the state of rational core route, consumers' attitude is more likely to decide behavior. Behavior-influenced attitudes are more likely to occur in peripheral routes, such as irrational purchases and consumer attitudes towards products in the context of interest-oriented and immediate expected value.

4. Influencing factors of consumer decision making process

There are two factors influencing consumer decision-making, for example, EKB model concludes that the internal factors influencing consumer purchase decision-making include trust, risk, utility, knowledge, attitude, personality, values, motivation, lifestyle and purchase intervention, and the external factors include family, culture, social class, interpersonal influence.

On the basis of the two-factor theory, the three-factor theory adds the influencing factors of "enterprise marketing". Kotler (2001) attributes the influencing factors of consumer decision-making to four aspects: social, cultural, personal characteristics, personal psychology. In addition, product categories and characteristics have a direct impact on consumer information search and processing. According to the degree of understanding and the way consumers understand the characteristics of the
products. Nelson (1974) divides the products into search products and experience products: (1) search products: the consumers easily to obtain products information, such as soap and toothpaste and other daily necessities; (2) experience products: consumers need to be able to make judgments after they are used, such as tourism and dining entertainment. (3) Credence product: The general consumer can not obtain the relevant information about the characteristics of the product even after use, so it is impossible to verify the quality of the product, and can only give trust, such as medical services and counseling. This classification method is applied more widely in the network environment.

5. Conclusions
Compared with the traditional environment, the network is not only a tool, but also an important context for consumer decision-making. Especially when consumers combine the search and processing of network information with online shopping, the impact of network situation on consumer behavior is more significant, which may be an important aspect ignored by previous studies. There are three advantages for consumers to obtain purchase decision-making information in the network environment: greater freedom. In the network environment, netizens have more network information available, more kinds of products for choice, anonymous virtual communities and blogs appear, so that people can fully share information, and the development of online stores, consumers can stay at home, free. Choice. More convenient, because of the rapid update of network technology and equipment, the Internet has been widely used and has become one of the most important channels of information access. With the development of 3G mobile phone and network interconnection, the advantages of network information transmission will be more obvious. Search engine and network instant messaging tools make people's daily life almost soak in the network. Lower costs, the use of network technology to process information, retrieval and classification work has been simplified, information processing costs, time and energy input reduced, and the speed of unprecedented increase.

Through the summary of the advantages of network information acquisition, combined with the above-mentioned theory, the overall view: In the network situation where consumers are, there are a large number of commercial and non-commercial information such as online advertising, online word-of-mouth, and so on, and frequent stimulation, consumers are in a continuous and high-intensity stimulation state, the possibility of external information to guide consumption Increase; Consumers search and process information in the network context, relatively more active and free, less constraints, decision-making behavior may increase arbitrariness; For search costs, can almost be ignored, regardless of the cost of the state, consumers may be less from self-memory to extract information, but more dependent on the network context. Provide information resources, so that the probability of using personal experience information based on rationality will be reduced; Consumers face more sufficient information, a variety of products, a variety of prices can be selected, consumer personality choice space ahead of the expansion, while network consumers in most cases for a separate "go online", often independent decision-making, rarely with Others consult, lack of "collective decision-making" or "reference decision-making", which is undoubtedly a little less rational; The entertainment function of the network is extremely powerful, consumers in the process of surfing the Internet are mostly in a relaxed state of enjoyment, taking irrational peripheral route to search and process information is likely to increase. Therefore, compared with the traditional situation, consumers are more likely to make irrational purchasing decisions in the network situation.

Reference
[1] Te Ma, Feng Ding. Research on the dynamic effect of the intelligent urban experience to the tourists' two-way internet word-of-mouth,November 2017,International Journal of Communication Systems.
[2] Bettman,J.R. Constructive consumer choice processes. Journal of consumer research, Dec 1998, Vol.25, Issue 3, pp.187-217.
[3] Nelson,Advertising as Information,Journal of Political Economy 1974,82(July/August):729-54.
[4] Feng Ding, Te Ma. Research on the dynamic relationship of homogeneity tourist destination based on tourist data, IEEE Access, 2018.05.