Network Information Foraging Behavior Strategy of Library Mobile Reading Platform Users

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Abstract—Information foraging behavior is the most common and basic information behavior under network environment. Network information resource always increases information net income as much as possible during the course of information foraging. By investmentrevenue analysis, the article discussed network information foraging strategy of library mobile reading platform users, and expounded the behavior mechanism and the significance of information behavior.

Index Terms—library mobile reading platform users, information foraging behavior, information foraging strategy

I. INTRODUCTION

Information is an important resource element which the library mobile reading platform requires. To a great extent, the acquisition time, cost, and obstacles of useful information affect the users' willingness and satisfaction when they use library mobile reading platform. When mankind entered the network centric world, they had been drowned by huge amount of information they created. "Information explosion" or even "information overload", which make users encounter more difficulties and challenges when they use the library mobile reading platform seeking and utilizing information. Although information can be transformed into knowledge, and then it can be into behavior decision-making ability, whereas in the chain of information to knowledge to capabilities, information is the starting point, our primary task is to obtain information in the behavioral decision. Because of the complexity of the network information environment, we must take appropriate information foraging strategies to obtain information. One purpose of researching information foraging is to explain and predict how people taking the most optimal information foraging strategies to change their behavior to adapt the changing of information environment. The article studied from network information foraging strategy of library mobile reading platform users, expounding the behavior mechanism of the most favorable information source, the optimal information spectrum, the most favorable information patchy and the significance of information behavior.

II. INFORMATION FORAGING THEORY

The discussed model is given as follow:

In the 1970s optimal foraging theory was first developed by anthropologists and ecologists to explain how animals hunting for food. It suggested that the eating habits of animals revolve around maximizing energy intake over a given amount of time. For every predator, certain preys are worth pursuing, while others would result in a net loss of energy. In the foraging process, animals need to constantly evaluate the predation food contained energy and their consumption energy, by selecting different environment and different food to optimize profit, the assessment results determine the animals remain to prey there or to find another one.

In the early 1990s, Peter Pirolli and Stuart Card from PARC noticed the similarities between users' information searching patterns and animal food foraging strategies. Working together with psychologists they analyzed users' actions and information landscape that they navigated (links, descriptions, and other data), they showed that information seekers use the same strategies as food foragers. People also need to achieve optimal balance between time, money, energy and the required information during searching for information. Therefore, they first proposed the information foraging theory [1], and pointed out that in the process of searching and absorbing information, people often need to constantly adjust their information foraging strategy according to their information environment to maximize information earnings.

Information foraging theory consists of three major components: information patches, information scent, and information diet.

Information foraging is the process of people seeking, acquiring, and absorbing information. Information foraging strategy refers to various methods and measures which people adopt to obtain maximum information foraging efficiency. Information patches is an aggregate with rich information resource as a physical metaphor in the information environment, it can be a website, a paper, a book, a web and a collection of documents people seeking information through them. Information scent is a concept extension of search scent; it is a subjective evaluation between the information and the information

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correlation during information seeking process, with a navigation action determining the information seeking methods. In short, the role of information scent helps people step closer to the information they require. On the process of searching for Internet information, people use information related marker to find the best information patches. Information diet refers to the kind of foraging information. Because of the regularity of network information resource distribution, and time, money and energy etc. scarce resources people spending in foraging information, people face how to select information in seeking information. If the seek scope is too narrow, it will make people spend more time to build a seek mode and increase the seeking results one-sidedness; if the selected range is too wide, people could be flooded by the retrieved information again. Thus, it's important that people select the appropriate information diet to search information under the network information environment.

So in seeking information, we evaluate the strength of the scent (determined by relevancy), the index of patch richness (how much relevant information are we likely to find) and the distance of the patch (how difficult is it to get).

Information foraging theory is a theory which applied the animal optimal foraging theory to how people searching for information under the network environment. It's assumptions are:(1) Before seeking information, there was a "built-in" information foraging mechanism, which people judged the information(resources) by information classification based on the contents existing in their mind, then make different information foraging strategies on the basis of the specific tasks required information. By revealing, mastering and using this mechanism, it can be better to understand people's searching behavior in the network, and guide technical personnel to improve design quality and usability of website and searching engines for any other users. (2) People's browsing behavior is guided by the information scent on the Webpage. Since Peter Pirolli and Stuart Card put forward the information foraging theory, PARC researchers developed detailed and systematic on information foraging theory [2]-[4], and researched the SNIF-ACT information foraging model (Models of information foraging). At present, the research on information foraging countermeasures are developing rapidly and deeply, it has become one of the hotspots of information behavior and information retrieval theory.

III. INFORMATION FORAGING STRATEGIES

A. Choosing the Best Information Resource

According to the information foraging theory, there are a variety of information resources in network environment, and different information resources' quality, enrichment and distribution pattern are not identical. Because of the time, money and energy limitation, people choose information resources will play an important role on the gain information efficiency. Then, how people search for and digest the information in the network environment? During the process of seeking and absorbing information, people need to consume time, money and energy to obtain the necessary information, but also get some net value of information, the formula is:

Net value of information= total energy informationseeking energy dissipation-processing and absorbing energy dissipation

Ratio between net value of information and information processing time is a measure of information resources advantage, in which the information processing refers to the time from seeking to absorb [4]. The information behavior study found, people always choose the more advantageous information resources in the information foraging activities. According to the research of Gursoy and Umbreit [5], people try to choose the maximum net revenue of information resources in the network information foraging. For information seekers, they will spend more money on collecting information from the higher cost information resources, so the information net income is higher in unit search time; though low cost information resources will spend less money, the useful information resources are too little, so the information net income provided will be smaller. Therefore, people should choose middle cost information resources in the information foraging, its net income in unit searching time is almost the highest and the advantage is also greatest.

B. Choicing the Optimal Information Spectrum

In people's information foraging activities, if the most advantageous information density in the information resources is small, information acquisition efficiency is low; on the contrary, the advantageous information density is large, the acquisition efficiency is higher, so people would choose some smaller advantageous information resources. It is because that if the most favorable information density and acquisition efficiency is low, the recognition time of people choose the most favorable information will be longer, acquired information net income of unit total processing time (total processing time, including recognition time and processing time) will be small; if the people have no strict selection on the information types, the recognition time will shorten and the information net income will increase. Under the network environment, people's information spectrum should include how much smaller advantageous types of information resources? Sandatrom, Agata and Spink have conducted in-depth investigation and discussion about this [6]-[8], they put forward the optimal information spectrum elements respectively, the main points are as follows: 1) if the advantageous information availability increases, the information category in the optimal information spectrum will decrease; 2)during people's information foraging, recognition time and information average benefit will decrease with the expansion of information spectrum range; 3 according to the information advantage and recognition time, the types in the optimal spectrum information could be presumed. Due to the need of information efficiency, people's unit time which intakes information energy should be maintained at a certain level [9].It can be speculated that:

① if there is enough favorable information opportunity to meet to ignore the poor information, then no matter the number of poor information will not affect the information foragers' specific selection of favorable information; 2 if the favorable information number increases, information foragers will immediately transform various types information foraging into a single. favorable information; ③ the assumption that people have been foraging optimal information spectrum range of types of information resources, there are two kinds of new information resources of X and Y, when forage X, the intake information energy in unit total processing time more than meet the information value people demand; when forage Y, the intake information energy in unit total processing time below information numerical which people's information needs, people always forage information resource X, and refuse to Y.

Under the network information environment, the optimal information spectrum should also include specific information or information elements (such as some data information, factual information and picture information etc.), which fulfils people's necessary information needs. Foraging this kind of information, can't target information net income energy but fulfill to increase people's knowledge or change the knowledge structure. In addition, the optimal information spectrum is usually with the change of information requirements and the network information environment.

C. Choosing the Most Favorable Information Patches

Information patches is an important theory in information foraging. Information foraging theory considers [10], the network information environment presents patches structure and information patches is a spatial and temporal characteristics of cluster information. Like selecting the most favorable information resources, under the network environment, people will seek the most favorable information patches to forage, namely people prefer to forage in big amount and good quality information.

People's information foraging activities usually cause the "reduction" of information patches' valuable information, or need more cost to obtain valuable information which makes information patches availability "lower" by time [3]. Therefore, people should choose the appropriate time to stop information foraging behavior, or transfer another information patches to search for information in the condition of less expense or overcoming the low technical. What mechanism to make people transfer one information patch to another at the right time? In 2005 Ingwerson and Jarvrvo [11] from the cognitive view, pointed out: "like animal foraging behavior in nature, patches structure in network information environment has great influence on people's information foraging behavior, even a decisive role on. In the uncertain network information environment, people need to constantly assess the information seeking expected cost and information expected value to information foraging behavior." determine their Therefore, people stay or leave the information patches is determined by giving up time .(Which is the longest time between obtaining useful information first time to the next time).In the information patches with large enough information density, two information foraging time interval is short, no more than the giving up time, so people will not transfer; but with a reducing value of information density, the interval time gets useful information is gradually extended, once more than the giving up time, people will give up this information patches and transfer to another. Giving up time is related to the seeking time, information transfer costs and the difficulty degree of information foraging, it equales the time from the last obtaining the useful information to leave the information patches. In the "built-in" information foraging mechanisms, people may have a relatively fixed giving up time, as if there is an alarm clock after each information foraging, people will leave when they can't forage information.

D. Information Sampling Foraging Behaviour

From the economics view, when people choice the most favorable information patches, they will reduce investment and improve efficiency of information foraging with the help of information behaviour. So, how people learn the relative advantageous of information patches? When people enter a new information environment for information foraging, they usually obtain information patches status in information environment by information sampling foraging (test retrieval) behaviour, and make the most favorable information foraging decisions according to these information. Generally speaking, people focus on maximum information density of information patches, when the most favorable information patches quality decline, people will transfer to the second favorable information patches to continue foraging information. In addition, people usually depends on the previous web or one time information seek behaviour accumulating all kinds of information resources abundance on the network, and store relative advantageous of every information patches for use.

IV. CONCLUSIONS

The information foraging theory development is very fast although it appeared not long. At present, China has begun to study the theory [12], [13].After some general overview on the information foraging theory, this paper discussed the network information foraging strategy of library mobile reading platform users by investmentbenefit analysis method. But this method does not analyze all network information foraging theory, therefore, we also need to study other laws based investigation.

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