

# Can Online Decision Aids Support Non-Cognitive Web Shopping Approaches?

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## Abstract

This article investigates two research questions concerning web shopping tools. The first asks how online decision aids can support a consumer's non-cognitive decision processes. The second asks how these tools support non-cognitive online shopping for products of different categories. To answer these questions, the author conducted a thorough literature review in the fields of management information systems, e-commerce and consumer behaviour. The results show that e-shoppers may adopt several non-cognitive decision-making approaches. Not one tool is sufficient to support all of these, but web stores should offer a selection of decision aids to satisfy their customers' needs. These tools need to be adapted as well to the categories of products offered in each web store.

**Keywords:** B2C E-Commerce, DSS, Online decision aids, ICT, Internet, Web store, Consumer behaviour, Non-Cognitive Decision-Making Approaches

## 1. Introduction

B2C online and mobile commerce is ever increasing in popularity. For example, in 2010, 60% of US consumers shopped online at least quarterly (Vertical Web Media, 2010). Online decision aids allow customers to self-serve, thus allowing them to "get exactly what they want in a process under their control" (Hemmatfar et al., 2010, p. 158 -159). They also benefit the organisation that can "sell at a lower cost or a premium price" (Kamis et al., 2010, p. 159).

Decision Support Systems (DSS) were first developed for managers who adopt a cognitive approach to problem solving. With the ever increasing development of online commerce, DSS research turned to supporting consumers' online decision process, with great emphasis on cognitive processes (see for example Pathak, 2010, Vachon, 2005, Zeng, 2010). However, in general, consumers reserve a cognitive approach for infrequent and/or more difficult, uncertain or financially important decisions, and those in which they feel involved. For most purchases, consumers adopt non-cognitive approaches to simplify or completely avoid a cognitive decision process (Olshavsky & Granbois, 1979, 1980). Online shopping DSS should support these non cognitive decisions to meet consumers' needs. If an e-shopping website does not meet consumers' preferences, "it's easy for online users to switch over to another e-market site that provides the same kind of services" (Vijayakumar & Lakshmithi, 2010, p. 105). Therefore, the first research question is:

*Q1. How do online decision aids support non-cognitive decision approaches?*

Research demonstrates that product characteristics influence how a consumer approaches a purchase decision. A cognitive decision process is well suited for utilitarian search products. For example, it is easy to obtain information online about computers (Girard et al., 2002). A non-cognitive approach based on effect or attitude will yield better results for other products, such as perfume or candies (Pham, 1998, Powell Mantel & Kardes, 1999, Shiv & Fedorikhin, 1999). The second research question is:

*Q2. How do online decision aids support non-cognitive decision processes for different product categories?*

To answer these questions, research articles in the areas of information systems, e-commerce and consumer behaviour were reviewed and synthesised. This article is divided as follows. In section 2, various online decision aids are investigated. Section 3 concentrates on non-cognitive approaches to decision-making and decision aids to support these. Section 4 examines product categories and which selection tools correspond best to their characteristics.

## **2. Online Decision Aids Available To Consumers**

A review of e-commerce research was conducted to identify decision aids studied in the literature that support various aspects of non-cognitive decision-making. The first three decision aids are specifically geared towards locating and evaluating information.

### *2.1 Search Engines (SE)*

Search engines, such as Google and Baidu, occupy an important place in the online decision-making process (Dou et al., 2010, Zeng, 2010). They allow consumers to find information about products, their attributes, their price and their location. Consumers build their query with their own keywords. They can use a query-by-example (QBE) tool such as Baidu's Options or Google's Advanced Search to set boundaries. Major SE rank links on a search result page according to different algorithms, which generally follow two rules. First is how similar the content of the web page is to the keywords used. Secondly is according to "the absolute 'authority' of the site which is related to the number of high-quality websites linked to each result" (Dou et al., 2010).

### *2.2 Website search tools*

Website search tools are provided by web stores to query their own product catalogue. They "assist consumers in the initial screening of the alternatives available in an online store" (Parra & Ruiz, 2009, p. 253). Most web shops offer a search tool where consumers can query based on a single criterion. Customers can either type their query or make a selection from a list of keywords (Gudigantala et al., 2008). Moreover, most websites organise products by categories, which further facilitates searches (Gudigantala et al., 2008). However, only 14.7% of major websites allow multi-attribute searches (Gudigantala et al., 2008)

### *2.3 Shopping Bots (Shopbots) or Comparison Shopping Agents (CSA)*

CSAs combine both the wide reach of a search engine with the search and comparison tools of a web store. CSAs are intermediaries that search for a given product among several web shops and facilitate comparisons between competitors' offerings (Pathak, 2010, Serenko & Hayes, 2010). CSAs can select alternatives based on price or other attributes such as brand, merchant reputation or delivery (Pathak, 2010). Research shows that shoppers of different decision-making styles perceived them to be useful (Park & Gretzel, 2010). Although CSAs are becoming increasingly popular (Pathak, 2010), many Internet shoppers don't use them or don't know about them (Serenko & Hayes, 2010). Some shoppers find the user interfaces difficult to understand in part because CSAs don't have an offline counterpart (Pathak, 2010). Most Shopping Bots presently available to consumers still suffer from several deficiencies. Many are biased towards those web shops that pay to be listed (Menczer et al., 2002, Serenko & Hayes, 2010). The most popular CSAs are server-based where users access a webpage via the internet to query web servers free of charge (Serenko & Hayes, 2010). The majority of server-based CSAs depend on merchants to provide price quotes and product information (Pathak, 2010). Because of this, quotes, specials and product availability are not always up to date.

The following two decision aids, virtual carts and wish lists, are mainly used to organise information and facilitate purchases.

### *2.4 Online Shopping Carts or Virtual Carts*

"Electronic carts are virtual spaces that exist on shopping websites and are provided with a similar purpose as traditional carts – to let customers store items for subsequent purchase at that shopping session" (Close & Kukar-Kinney, 2010, p. 986). Close and Kukar-Kinney (2010) have researched other ways online shoppers use virtual carts. These are sometimes the only tool available for customers to figure out the total purchase price including taxes and shipping charges. Often the online cart will be used to take advantage of retail offers such as free delivery for a certain purchase amount. Registered customers can use persistent online carts, offered by some websites, to organise information about products considered for possible future purchase. Close and Kukar-Kinney (2010) recommend that automatic updates of persistent carts reflect changes in prices and special offers.

### 2.5 Wish Lists

A wish list is a virtual space, apart from the shopping cart, where registered customers can place items for future consideration or possible gift suggestions to friends and family (Close & Kukar-Kinney, 2010). Many consumers will prefer to use a persistent shopping cart rather than a separate wish list to avoid transferring items from one to the other (Close & Kukar-Kinney, 2010).

Some decision aids offer shoppers recommendations about products. The two main categories are electronic word-of-mouth and recommender systems.

### 2.6 Electronic Word-Of-Mouth (eWOM)

Internet allows consumers to share their opinions through various means: blogs, forums, consumer ratings and endorsements (Cheung et al., 2009, Ha, 2002, Sia et al., 2009). These allow consumers to pass along first-hand experience with a product or an e-retailer (Ha, 2002). Cheung et al. (2009) found that the credibility of eWOM was increased when the argument is viewed as “convincing or valid in supporting its position” (p.15), when the source itself is credible (p.17), when the recommendation is consistent with previous ones by users (p.18), and if the recommendation is highly rated by other readers (p.18). Culture may have an influence on the role played by eWOM. Research shows that peer customer endorsements are more trusted by consumers from a collectivistic culture than by those from an individualistic culture (Sia et al. 2009). It is important for e retailers to encourage the development of an online community of contributors to their websites (Cheung et al., 2009, Ha 2002, Tan et al., 2009) in order to attract customers and improve the credibility of their sites. They must detect and solve any customer service problem reported on the online communities so as to mitigate the effects of negative eWOM (Tan et al., 2009).

Reputation systems are another form of eWOM. They are used to rate trading partners participating in online auctions and marketplaces such as eBay and Amazon Marketplace (Jian et al., 2010). They provide pre-purchase information about sellers and, in some cases, buyers allowing prospective trading partners who don't know each other to lessen any transaction risks (Ha 2002, Jian et al., 2010). Despite the possibility of information free-riding, “more than half of the traders on eBay provide feedback” (Jian et al., 2010, p.1). However, for high valued items, eBay buyers are more likely to give feedback and pay more attention to service quality (Jian et al., 2010).

### 2.7 Recommender Systems

Recommender systems automatically generate product recommendations for shoppers. The two main categories of recommenders are ‘collaborative filtering’ and ‘content-based filtering’. Collaborative filtering consists in suggesting products chosen by other users with similar interests (Flesca et al., 2005). When an Amazon customer selects a book, a list of suggestions is proposed under the title “Customers Who Bought This Item Also Bought” (www.amazon.com). Content-based filtering bases its suggestions on content that the user has previously rated (Flesca et al., 2005). The video online provider Netflix.com proposes to users a list of film titles to rate, indicating that “The more you rate, the smarter our suggestions get” (Netflix.ca/RatingsWizard). Newer personalisation systems suggest content personalised for each customer by mining and learning from their browsing pattern (Flesca et al., 2005, Vijayakumar & Lakshmithi, 2010).

The final tools allow consumers to either try products online or build a mental representation of using the product.

### 2.8 Sampling of Digital Products

Digital products are the easiest to sell online because they can be tested and even delivered immediately through download or online services. Samples of these products are offered, for example through 30-second song excerpts, movie previews and a few pages from a book. These samples allow the consumer to “ensure the quality and authenticity of the work prior to purchasing it” (Crowne-Mohammed & Rosenszajn, 2010, p. 624). Consumers can sometimes download and install trial versions of software. These versions are limited to a specific number of uses or some functions are disabled. For example, the computer game publisher, PopCap Games, allows gamers to try their software for sixty minutes of play before buying them (www.popcap.com).

### 2.9 Virtual Product Experience

Virtual Product Experience (VPE) refers to multimedia technologies that enable customers to experience a product virtually, i.e. customers can see not only a 3-D image of a product, but can also examine it by zooming in and out and manipulating the images (Chen et al., 2008, Ha, 2002, Jiang & Benbasat, 2005).

These technologies are particularly useful for experience products that consumers must use at least once to

ascertain their quality level (Girard et al., 2002). An example is shopping online for clothes. Consumers are uncertain of the fit unless they have previously bought an identical item. A virtual model is a tool that allows customers to virtually try on clothes. The most advanced tools allow shoppers to provide their anthropomorphic measurements to create this model (Paquet & Victor, 2007). For example, [www.hawesandcurtis.com](http://www.hawesandcurtis.com) allows men to try on shirts using the 'Virtual Trying Room' application ([www.fits.me](http://www.fits.me)).

### *2.10 Social Presence*

Perceived social presence, such as pictures of people using the product, lively product descriptions and personalised greetings increase the feeling of flow and make it easier for the consumer to imagine using the product (Hassanein & Head, 2007). This is especially important for hedonic products. Direct contact with sales reps, through chat, VOIP or e-mail increases trust towards the online vendor.

Cultural adaptation is another important social aspect of online stores. Several researches have studied online shoppers from different cultural backgrounds and websites targeting these groups (Karaçay et al., 2010, Sia et al., 2009, Singh et al., 2008, Vachon & Vachon, 2010). These articles show that simple translation is not sufficient and that the websites must be adapted culturally and linguistically to their target audience.

The following section examines how these decision aids can support non-cognitive decision-making.

## **3. Non-Cognitive Approaches to Product Selection**

Section 3 focuses on the first research question "How do online decision aids support non-cognitive decision processes for different product categories?" For a large proportion of their purchases, consumers greatly simplify the decision-making process, or even circumvent it entirely, by adopting a non-cognitive approach (Olshavsky & Granbois, 1979, 1980). Olshavsky and Granbois (1979) identified several non-cognitive approaches to decision-making:

Purchases can occur out of necessity; they can be derived from culturally mandated lifestyles or from interlocked purchases; they can reflect preferences acquired in early childhood; they can result from simple conformity to group norms or from imitation of others; purchases can be made exclusively on recommendations of personal or non-personal sources; they can be made on the basis of surrogates of various types; or they can even occur on a random or superficial basis. (Olshavsky & Granbois, 1979, p.98)

Each of these non-cognitive decision approaches is explained in the following subsections. Also presented are decision aids supporting each approach.

### *3.1 Necessities*

There are times when a consumer can neither avoid the purchase nor select from a range of different products (Olshavsky & Granbois, 1979). Prescribed medication is such an example. Although the consumer cannot avoid the purchase itself, decision aids such as shopping agents or search engines can help with related sub-decisions, such as price, service, delivery and payment options. Shopping agents will be particularly useful for price-adverse consumers (Pathak, 2010). Shopping online for necessities such as groceries is more often the result of circumstances such as illness, lack of transportation or convenience "rather than by a cognitive elaboration and decision process" (Hand et al., 2009, p. 1215). If their circumstances improve, consumers will often stop shopping online for these necessities, especially if they perceived a lack of service quality (Hand et al., 2009).

### *3.2 Interlocked Purchases*

Without being a necessity per se, the purchase of a product can be required by the use of another product (Olshavsky & Granbois, 1979). For example, acquiring a printer thus makes it necessary for the consumer to buy replacement ink cartridges. A recommender system supports shoppers by reminding them to buy interlocked products. For example, on the product page for an inkjet printer, the online electronic store [www.tigerdirect.com](http://www.tigerdirect.com) adds links to interlocked products: cables, cartridges and paper. Allowing consumers to access previous orders can greatly simplify replenishment.

### *3.3 Habit*

"The consumer may have bought the same brand many times, and may not really think much about this type of choice while it is being made" (Bettman & Zins, 1977 as cited in Olshavsky & Granbois, 1979, p. 98). After using a satisfactory product a few times, it is not necessary to carry out a new decision-making process unless new information is received or the product is not available. Wish lists or persistent shopping carts can facilitate repeat purchases. [www.grocerygateway.com](http://www.grocerygateway.com) allows customers to create lists of groceries and save their favourite products and brands, removing the need for the customer to make a new grocery list upon each visit. A persistent

shopping cart or a wish list may be used for the same purpose.

Habit is also a powerful influence when it comes time to decide which website to visit and which decision aids to adopt. “We know that people do not like to learn new skills, and that they prefer to use skills they already have when they begin to use a new technology” (Murray et al., 2010, p. 239). Thus, they may be reluctant to use a shopbot requiring them to exert some learning effort or to answer detailed questions about their preferences. So-called passive recommender systems that require user minimum input and adapt to their online behaviour would better support shoppers who prefer “more natural and comfortable interactions” (Murray et al., 2010, p. 240).

### *3.4 Preferences Formed During Childhood*

During childhood, consumers form a preference for certain products, for example foods. They do not have to engage in a cognitive decision-making process before purchasing such products (Olshavsky & Granbois, 1979). In an online shopping context, shopping for preferred products becomes one of ‘where’ to buy rather than ‘what’. “The use of a search tool allows consumers to find their preferred products very easily, while expending substantially less effort than without search tools” (Parra & Ruiz, 2009, p. 260). Examples of search tools include SE, shopbots and webpage search tools. Thanks to online stores, members of ethnic minorities have access to commodities which were unavailable in their region prior to online shopping (Singh et al., 2008, Singh et al., 2009, Vachon & Vachon, 2010). In order to serve these groups, web stores must be adapted to their target audience (see subsection 2.10).

### *3.5 Delegated Decision*

Consumers may buy a product on the basis of a recommendation from a human or non-human source. Instead of evaluating the product themselves, they delegate the decision-making process by trusting the opinion of a reliable source. Offline examples of such reliable sources are relatives, friends, salespersons or journals. The decision can also be partially delegated: recommendations are used to simplify the decision-making process. A recommended product could serve as a yardstick for comparison. An evoked set of recommended products can also be formed (Olshavsky & Granbois, 1979, Rosen & Olshavsky, 1987). Consumers can obtain recommendations online through eWOM and recommender systems. According to Senecal and Nantel (2004), shoppers who had consulted recommendations were twice as likely to select a recommended product than those who hadn’t look at them. They also found that more consumers selected suggestions from recommender systems than from eWOM. However, consumers use eWOM to mitigate the perceived risk and uncertainty of shopping online, especially in online auctions (Ha, 2002). Negative information received from eWOM has a stronger impact on the buying decision than positive feedback (Fagestrom & Ghinea, 2011).

### *3.6 Social Influence*

Consumers conform to socio-cultural norms or sometimes imitate people around them. In this case, they observe the consumption behaviour of those around them in order to decide which product to purchase. Social influence can be informational or normative. Informational influence occurs when the consumer infers information about a product which is difficult to evaluate directly by observing the behaviour of others. Normative influence occurs when consumers choose the same products as other members of a social or cultural group with whom they identify. Their goal is to conform to behavioural norms or to avoid undesirable social consequences, or to benefit from the advantages of belonging to the group (Burnkrant & Cousineau, 1975, Calder & Burnkrant, 1977, Fisher & Price, 1992, Olshavsky & Granbois, 1979). Some commercial brands are perceived as prestige-conferring, for example luxury cars or certain brands of athletic shoes (Randall et al., 1998). Shoppers seeking to “keep up with trends and to create a new image” are motivated by e-stores that are attractive and offer merchandise variety (Ganesh et al., 2010, p. 111). Both normative and informative influences can be exerted through eWOM. Electronic social networks offer new opportunities to promote products or services (Arthur et al., 2009, Murray et al., 2010, Tan et al., 2009). Public health organisations use these networks to reach target groups, such as young people between the ages of 18 and 24 (Thackaray et al., 2008). Online merchants can reward consumers who already use their product to influence their social network friends to buy or try it, a practice known as viral marketing (Arthur et al., 2009).

### *3.7 Random choice*

Consumers may sometimes make a random or very superficial selection (Olshavsky & Granbois, 1979, 1980). For example, in an offline context, they may simply choose the product which is most easily accessible on the shelf. Certain decision aids will help consumers improve the quality of a ‘random’ choice. Picking the first ranked link insures that the choice at least follows the SE’s heuristics of best fit and site ‘authority’. Google

offers the option of jumping directly to the first ranked page, 'I'm feeling lucky', instead of displaying all results. A shopbot, especially an adaptive tool, could improve decision quality even more. However, would a consumer trying to eliminate all decision-related efforts be willing to learn and adopt a shopbot? More research is required to answer this question.

### 3.8 Impulse Buying

Consumers sometimes buy a product that they didn't intend to buy prior to entering a store, such as clothes or food. This could be due to the shopper's affective state, to an urgent situation, because the item is on sale, in order to replace an item or to try something new (Olshavsky & Granbois, 1980). Consumers may buy a product simply because, for them, shopping itself is a hedonic activity (Hassanein & Head, 2007). However, impulse buying can also be viewed as a risky activity due to problems such as overspending or making a selection error. Consumers rarely regret their impulse buying because of their capacity to refrain from purchases they perceive to be socially inappropriate (Dawson & Kim, 2009). Online stores must mitigate the risky aspects of online impulse shopping so that consumers don't have to refrain from buying. Security concerns can prevent shoppers from buying from an e-store (Ganesh et al., 2010, Hassanein & Head, 2007). Store security attributes include privacy protection, website certification, secure payment and reputation system (Ganesh et al., 2010, Jian et al., 2010, Verhagen et al., 2010). Return policies help mitigate inappropriate decisions (Zeng & Xu, 2010). These policies can include: money-back guarantees, no-questions-asked return period, free shipping, return package pick-up at home and offline presence.

Site functionalities aid impulse and planned buying by facilitating both browsing and searching shopping modes:

- a) Interactivity, i.e. communication with merchant and ease of accessing information (Ballantine, 2005, Bridges & Florsheim, 2008, Tan et al., 2009, Yang & Young, 2007);
- b) user interface ease of use (Detlor et al., 2003, Hassanein & Head, 2007);
- c) hassle-free transaction with one-click buying option available for registered users (Close & Kukar Kinney, 2010);
- d) availability of offered products (Detlor et al., 2003);
- e) accuracy, completeness and currentness of product information (Tan et al., 2009); and
- f) short delivery times and reasonable delivery costs (Detlor et al., 2003, Zeng & Xu, 2010).

Cues provided to online shoppers can trigger impulse shopping (Dawson & Kim, 2009). Sales and promotions (coupons, free shipping or percent off when certain limit is reached) appeal to bargain hunters. Prices of items added to wish lists or persistent carts as well as product information should be kept up-to-date. Loyalty plan members can receive e-mail price updates and coupons. Ideas (latest trends) and suggestions are other trigger cues. Shopping assistants and recommender systems can customise these cues according to the shopper's preferences (Menczer et al., 2002).

Impulse purchases often result from hedonic shopping. Consumers who are more responsive to their affective state than their cognitive state are more likely to buy impulsively online (Dawson & Kim, 2009). Therefore, the shopping experience should generate a positive affect and enjoyment. To do so, a website should be aesthetically appealing (Wang et al., 2011). Virtual visual and functional control, models and digital sampling all increase flow. "In the context of computer-mediated environments, flow is used to represent a subjective psychological experience that characterises human-computer interactions as playful and exploratory" (Jiang & Benbasat, 2005, p. 117).

### 3.9 Quality surrogates

Instead of evaluating a product directly, the consumer can resort to proxies, such as prices or brands, as quality cues. The brand ensures a constant level of quality to consumers (Alba et al., 1997, Ha, 2002, Randall et al., 1998). For consumers, shopping at a website with a well-established brand store, either offline or online, reduces perceived risks (Ha, 2002, Tan et al., 2009). Those risks include quality misrepresentation and poor service. A product's brand is one of its most important quality cues, since it reduces uncertainty about the product. SE, website search tools and CSAs are all useful to consumers looking for specific brands (subsections 2.1, 2.2, 2.3).

Product categories have an important impact on online shopping. The next section examines how decision aids support online shopping for products of different categories.

## 4. Product Classifications

Section 4 investigates the second research question "How do online decision aids support non-cognitive decision

processes for different product categories?”

Products can be classified according to their function, either hedonic or utilitarian (Verhagen et al., 2010), or according to their attributes: search, experience or credence (Andersen, 1994, Girard et al., 2002). A product's function and its attribute class have a bearing on whether or not the consumer adopts cognitive or non-decision processes.

#### *4.1 Product Function*

Utilitarian products perform purely instrumental functions, with product features that can be directly and objectively linked to the utility of the product, i.e. more RAM leads to more processing capacity. Hedonic products, on the other hand, elicit sensory stimulation, emotions and fantasies; their function lies in the pleasure they evoke. (Verhagen et al., 2010, p.142)

Whether products are utilitarian or hedonic depends largely on individual tastes and preferences. A working parent may consider the family car as utilitarian because it is used for transportation to work and family activities. Her neighbour who walks to work may consider her sports car to be hedonic. Some products, such as apparel or food, may have both utilitarian and hedonic functions.

A product's function impacts which product attributes need to be evaluated and how. Attributes of utilitarian products can usually be evaluated according to objective criteria. A cognitive decision process using a multi-attribute heuristic would lead to the best decision in terms of objective criteria (Todd & Benbasat, 2000). Decision aids that allow consumers to collect and process objective information about the product would be very helpful as these would reduce cognitive efforts. These will not be discussed further because the present article focuses on non-cognitive purchase processes.

However, even when forgoing cognitive decision processes, consumers can select utilitarian products that meet their needs. The following approaches ensure consumers pick a utilitarian product previously found to be satisfactory: habits, early preferences, recommendations and social influence. Refer to subsections 3.3, 3.4, 3.5 and 3.6 for supporting decision aids.

On the other hand, hedonic products are best considered in terms of affect. In order to support selection of the most satisfactory alternative, online decision aids must allow the consumer to evoke pleasant feelings related to product use. The following section examines how this can be achieved by looking at product classification.

#### *4.2 Product Class*

Goods can be classified as research products, experience products or credence products. While most products predominantly belong to one class, they include some characteristics of each class, depending on the quality of available information.

##### *4.2.1 Research Products*

Research goods are those whose quality can be evaluated on the basis of external information before they are purchased or used for the first time (Girard et al., 2002). Research is the class of products most preferred to purchase online because information about their features is easy to acquire (Girard et al., 2002). Search engines were developed to locate information online using a keyword search. Selecting the right keywords is easy for an expert. Expert users are able to focus on the more important attributes, those that best correspond to their needs and values (Bettman et al., 1998, Coupey et al., 1998). However, a consumer with little or no product knowledge will not be familiar with product characteristics and will not be able to understand their meaning. A shopping agent or a recommender system can help novice consumers. Unfortunately, “their lack of knowledge may prevent them from providing the tool with the type of information that is necessary for it to provide useful assistance” (Murray et al., 2010, p. 240).

A Case-Based Reasoning expert system could be an excellent tool to support a novice user. In a CBR, descriptions of past situations with their solutions are stored in a database. When presented with a new scenario, the system looks in the database for cases with similar characteristics. When the closest fit is found, the system suggests solutions initially applied to the former case. The new case is then added to the database along with its successful solutions as well as notes about unsuccessful ones (Liao, 2005). Rather than inquiring about product characteristics, the expert system would ask questions about how the product will be used. After matching this usage scenario to an existing one, it could then suggest products that best fit the consumer's needs. A scenario-based DSS would allow consumers to concentrate on how they would use the product, a more salient source of information for them, rather than think about attribute values which are meaningless to them. Murray et al. (2010) noted that online shoppers do not like to provide information nor answer questions. A CBR

shopping assistant would need to be tested to see if use cases would be more acceptable to users and yield better results than answering questions about their needs.

#### 4.2.2 Experience Products

Experience products are those which the consumer must have used at least once before in order to confirm their quality level. This initial test provides consumers with information which they carry over in subsequent purchases (Andersen, 1994, Peterson et al., 1997). Social presence such as dynamic descriptions, pictures of people and sales associate support is helpful for experience product shoppers (Hassanein & Head, 2007). Virtual reality experience tools and digital sampling are excellent for virtually trying out certain products. For now, however, taste, smell and touch cannot be experienced virtually. For example, Hand et al. (2009) found that online grocery shoppers missed the experience of selecting produce and foods themselves. A generous return policy is also helpful in diminishing the risk of buying an untried experience product (Zeng & Xu, 2010). Nevertheless, consumers may decide that returning low-cost products is not worth the effort, for example slightly withered produce. They may instead decide to stop visiting that website. Service quality, such as ensuring that only satisfactory experience products are delivered, is important to retain online shoppers (Hand et al., 2009).

#### 4.2.3 Credence Products

Consumers cannot ascertain the quality of credence products even after having used them. This is due to an information asymmetry between sellers and buyers. Organic food is an example of a credence product: it is extremely difficult for consumers to verify whether or not pesticides were in fact applied. The consumer must evaluate both the truthfulness of the information provided and the source's credibility (Alba et al., 1997, Andersen, 1994, Girard et al., 2002). The best way is often to resort to proxy quality cues. Product certification programs and well established brands reduce uncertainty and increase search characteristics of credence products (Girard et al., 2002, Ha, 2002). Those proxies must apply to both the product itself and the web store as well. Shopping at well-established web stores, if they also have a strong offline presence, increases confidence in claims about their products. Reputation systems help consumers assess the credibility of smaller or less known merchants, thus mitigating some risk of buying credence products from them.

### 5. Conclusion

Non-cognitive decision approaches are very important in e-commerce because consumers rely on them for most of their purchases. This article examined the following two research questions:

*Q1: How do online decision aids support non-cognitive decision approaches?*

*Q2: How do online decision aids support non-cognitive buying decisions for different product categories?*

These research questions were investigated by reviewing research articles in the areas of information systems, consumer behaviour and e-commerce. The results show that e-shoppers may adopt several non-cognitive decision-making approaches. Not one tool is sufficient to support all of these but web stores should offer a selection of decision aids to satisfy their customers' needs. Decision aids should be tailored to support the target audience. These tools need to be adapted as well to the categories of products offered in each web store.

This synthesis contributes to the research in e-commerce by incorporating results from different streams in an integrated framework. It offers researchers both an overview of current research and leads for further investigation. It also contributes to practice by demonstrating how shopping websites' decision aids can be geared towards supporting consumers' non-cognitive decision processes.

Nonetheless, this article presents certain limitations. To begin with, although the article is based on current research, the research questions were not empirically tested. Second of all, for reasons of conciseness, this article does not examine the consumer's cognitive decision-making process. The author proposes to pursue these lines of inquiry in upcoming research projects.

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