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Searching for Decisions Online

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Summary

The popularity of online search has gained immense momentum since the inception of the World Wide Web. With an ever expanding Internet user base, the online medium has become one of the primary sources of information for consumers looking to make a purchase.

In this context, information seeking activities have been broadly categorized into two types: browsing (i.e., no specific goal) and directed-search (i.e., specific goal). Furthermore, consumers have limited information processing capacities and as such employ a variety of decision making strategies, when choosing amongst a set of options, to deal with these limitations. The strategies evaluate options either by alternative (i.e., one product at the time) or attribute-based processing (i.e., one product characteristic at the time).

The present study investigates the relationship between information seeking activities and the type of processing employed in the online context. The effect of repeat visits to a website as an antecedent of information seeking activities is also investigated.

During the course of the experiment, thirty-eight participants were randomly assigned to either the intra or inter-website visitor groups. Participants in the inter-website group visited seven different music sites making a song selection on each site while the intra-website group was made to visit the same site seven times making a song selection on each visit. Eye-tracking was used to measure eye movements of participants throughout the course of the experiment.

Results indicate that participants with a greater proportion of time spent looking at directed-search elements of a webpage (e.g., website search engine) had longer visual sweeps across the attributes of a song, indicating a greater degree of alternative-based processing. Additionally, repeat website visits resulted in a higher proportion of time spent performing directed search. The implication of the findings in relation to website customization and tailoring according to users' information searching behavior, are discussed.

Keywords: decision strategies, information search, prepurchase information search, information processing, website quality, repeat visits, eye-tracking, scanpath

Sommaire

La popularité de la recherche en ligne s'est considérablement développée depuis les débuts du Web. Avec l'utilisation toujours croissante d'Internet dans la vie courante, ce médium est devenu l'une des principales sources d'information pour le consommateur qui cherche à faire des achats.

Dans ce contexte, les activités de recherche d'information se divisent en deux catégories générales: le «browsing» (sans but spécifique) et la recherche directe (celle poursuivant un but spécifique). Les consommateurs ayant par ailleurs des capacités limitées à traiter l'information, emploient, face à une multitude d'options, différentes stratégies de prise de décisions afin de pallier à ces limites. Ces stratégies permettent d'évaluer les options soit par produit (un produit à la fois), soit par caractéristique (une caractéristique du produit à la fois).

Dans cette étude, nous nous penchons sur le lien entre les activités de recherche d'information et le type de traitement d'information employé dans une situation d'achat en ligne. L'effet que pourrait avoir la visite répétée d'un site web a également été étudié en tant qu'antécédent à la recherche d'information.

Dans le cadre de cette recherche expérimentale, trente-huit participants ont été sélectionnés et assignés de façon aléatoire dans l'un des groupes suivants : inter-visiteur de sites web, intra-visiteur. Les participants du groupe inter-visiteur ont visité sept sites de musique différents, et ont sélectionné une pièce musicale à partir de chacun d'entre eux. Les participants du groupe intra-visiteur ont quant à eux visité le même site à sept reprises en sélectionnant une pièce lors de chaque visite. L'oculométrie a été utilisée pour mesurer les mouvements des yeux tout au long de l'expérience.

Les principaux résultats indiquent que la recherche d'information des participants qui passent plus de temps sur les éléments de recherche directe (ex.: moteur de recherche) se caractérise par un balayage visuel plus long sur, les caractéristiques d'une pièce musicale, indiquant ainsi un plus grand degré de traitement d'information par produit. De plus, le fait de visiter un site web à plusieurs reprises implique que le participant passe plus de temps à effectuer de la recherche directe. Les implications de ces résultats en relation avec la personnalisation des sites web, optimisés en fonction des comportements de recherche d'information des utilisateurs, sont finalement discutées.

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List of Acronyms

EQW: Equal Weight Heuristic

WADD: Weighted Additive Rule

LEX: Lexicographic Heuristic

EBA: Elimination By Aspect

AOI: Area of Interest

URL: Uniform Resource Locator

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Chapter 1: Research Context

1.1 Context

In the last two decades, the Internet has become an essential component for billions of people in their everyday lives. Search engines are indispensable tools in sifting through the plethora of information accessible through this medium, helping users locate the information for which they are searching. In the short time these online search technologies have been available, there has been a fundamental change in the ways the Internet is used in both the business world and personal life. These technologies are now amongst the most widely used tools on the web, reflected by a colossal 1.6 trillion searches in 2010, representing a staggering 780 billion dollars USD in the global economy (Bughin et al., 2011). In Canada, the 2010 Canadian Internet Use Survey revealed that 80% of individuals aged 16 and over had used the Internet for personal use. Of these users, 74% browsed for information online regarding goods or services, and 51% of users continued in this vein, to order a good or service online. In the Canadian economy, this amount of online purchase represented 15.3 billion dollars in 2010 (Statistics Canada, 2010).

Online search continues to evolve at a phenomenal rate, as new search technologies become more effective and the online content that is searchable is greatly expanded. This evolution has broadened the horizon of where searches can occur online, and today search technologies are included in a variety of sites including virtually all e-commerce sites. Indeed, a user visiting popular e-commerce sites such as Amazon.com or ebay.com will immediately notice the search tool, as it is generally positioned prominently in the upper center of the home page. This increased prominence of online search, accompanied by an expanding base of Internet users, indicates continued growth into the future for the online search economy and resulting online purchases of goods or services.

Consumer information search is an important initial step in the purchase decision process. When consumers are faced with a purchase problem, information search allows them to gather information necessary to evaluate the alternatives, so as to make a final purchasing decision (Bettman, Johnson, & Payne, 1991; Schmidt & Spreng, 1996). In this regard, online information search comprises two modes of searching activity being either browsing or directed search (Rowley, 2000). Browsing is a mode of information search that is elicited when users are uncertain how their shopping needs can be satisfied and do not have a precise idea of what is desired. This mode consists of gathering information without a precise objective, by scanning available information in a given space on an Internet site. On the other hand, directed search consists of seeking out specific information regarding a product, with the intent of making a purchase decision (Detlor, Sproule, & Gupta, 2003). In this case, consumers generally know what they are searching for and possess some limited information on the product being searched.

Information search allows consumers to discover options available to them for a particular purchase problem. In order to choose amongst these options, consumers employ a variety of decision strategies to narrow the number of choices so as to make a final decision on a particular option. There are numerous decision strategies which can be employed and these vary from one consumer to the next. Although it is difficult for an external observer to discern which of these decision strategies are being used by a consumer, it is possible to identify the type of information processing occurring when options are compared. The type of information processing used is a characteristic of the various decision strategies, and this can be either by alternative or by attribute (Bettman, 1979). In alternative-based information processing, the focus is on a single alternative, acquiring information across multiple attributes for the alternative before considering the next one. Conversely, in attribute-based information processing, the focus is on obtaining information on a single attribute across various alternatives, and then moving to the next attribute. In regards to the choice of decision strategies to be used by consumers, Payne (1976) asserts that decision strategies are selected in function of the task complexity faced by consumers in a choice problem. Here, the major determinants of task complexity are said to be the number of alternatives as well as the number of attributes per alternative (Bettman, Johnson, & Payne, 1990; Payne, 1976).

Interestingly, much of the literature on decision-making theories suggest that decision strategies employed in making a choice are not mutually exclusive but rather used together sequentially (Howard & Sheth, 1969; Newell & Simon, 1972; Payne, 1976). In other words, a consumer is postulated to first adopt an attribute-based decision strategy to eliminate certain options followed by the adoption of an alternative-based decision strategy to evaluate the each of the remaining options to arrive at a final choice. In contrast to this notion of the sequential use of these two information processing types for decision-making, an experiment using eye-tracking technology by Shi, Wedel, and Pieters (2013), demonstrated a high incidence of switching between attribute and alternative-based modes of information processing, when navigating an e-commerce site with the intent to make a purchase. Here, participants seemed to consider clusters of attribute and product information with the amount of information gathered on attributes inducing a switch away from alternative-based information processing. Conversely, information gathered on products induced a switch away from an attribute-based mode of information processing (Shi et al., 2013).

It is important to note that certain characteristics of the online context can affect information seeking activities. A website's complexity can impose a varying degree of effort on users (Schmutz, Heinz, Métrailler, & Opwis, 2009), which may affect the way in which they seek out information on that particular site. In addition, users become more efficient using a website as they gain experience through repeat visits (Johnson, Bellman, & Lohse, 2003). In turn, this efficiency in using a website may also have an effect on the types of information seeking activities employed when using the website.

1.2 Research Objectives

The studies pertaining to the decision-making process described above investigate the two information processing types in relation to decision strategies. Some studies have investigated the possible links between the aforementioned search activities (browsing and directed search) and information processing, but do so in an offline context, referring to search activities and choice selection in function of predetermined preferences (Chernev, 2003b; Simonson & Tversky, 1992). The online context offers an immense availability of information and seeing as users have limited information processing capacity (Bettman, 1979) the amount and type of information seeking activities may be affected in this environment. It is unclear in the literature, whether the proportions of online information search activities described above, affect the type of information processing employed by consumers engaged in online pre-purchase information search. This study seeks to contribute to information processing literature by investigating participant's online search and browse behaviors and the resulting processing of information when making a purchase decision online. Furthermore, the effects of mediators such as experience using a website on the proportions of information search activities carried out have not been probed thus far. Clarifying this mediating effect is another goal of this study as there are important practical implications for website design and creating a user experience that supports the type of information search undertaken by consumers. In view of these observed gaps, the objectives of the present study are two-fold:

i. To assess the relationship between online browse and directed-search information seeking activities and the type of information processing employed by a consumer when deciding amongst alternatives in an online pre-purchase context.

ii. To examine the effects of repeat visits to a website on the proportions of time spent on browsing and directed-search information seeking activities.

The rest of this thesis will be structured as follows: next a literature review will look at the various theories used to formulate the research model and the hypotheses will be presented. Following this review, the research methodology to test these hypotheses for the present study, will be described. Finally, the results of the study will be presented and discussed as well as the limitation of the study and possible avenues for future research suggested in the last section of the thesis.

Chapter 2: Literature Review

The objectives of the literature review is to present the concepts related to the research question as well as situating this paper amongst the existing studies regarding information seeking behavior and information processing in decision strategies leading up to online purchase. The chapter begins by investigating the literature regarding information search, followed by a review of decision-making strategies and the manner in which information is processed in function of these strategies. Subsequently, research on information processing in online pre-purchase information search and the division of search behaviors into the overarching categories of browsing and directed search is examined. This review will also examine possible antecedents of browse and search behaviors and will conclude with the known linkages between eye-movements and types of information processing exhibited, thus validating the use of eye-tracking technology for such a study.

To complete the literature review several databases of scientific articles were consulted including: HECtor, ABI/Inform, ACM Digital Library, IEEE_Xplore, JSTOR: Journal Storage, PsycNet and ScienceDirect. Keywords for the article search included: decisions, decision strategies, information search, prepurchase information search, information processing, website quality, repeat visits, website experience, eye-tracking, and scanpath. The articles retained allowed the identification of other related articles which were found using the Google Scholar search tool.

2.1 Information Search

Consumer information search is a crucial component of the purchase decision process. This process is typically comprised of steps evolving from problem recognition, onto information search, before evaluating alternatives, in order to formulate a purchase decision (Bettman et al., 1991; Olshavsky, 1985; Schmidt & Spreng, 1996). This information search is one of the most persistent topics in consumer research (Beatty & Smith, 1987) and the literature is divided into three major streams regarding consumer information search models (Srinivasan, 1990): motivational/psychological approach, the economic approach (using a cost-benefit framework for information search) and the information processing approach. Schmidt & Spreng (1996) suggest that this third category, information processing, is encompassed in the motivational/ psychological approach, which includes both motivation and ability to search. They further include the economic approach in their model by considering costs and benefits of search to be antecedents of the motivation to search.

The amount and cost of information search may differ depending on the type of good a consumer is seeking. Here it is useful to elucidate the difference between a search and experience goods to illustrate this discrepancy. According to Nelson (1970)'s classification, a search good has a majority of attributes for which information can be acquired prior to purchase, such as price or model. In contrast, an experience good is dominated by attributes for which the value cannot be ascertained before purchase and use of the product, such as quality. From the economic approach of a cost/benefit framework to information search, Nelson (1970) states that, in an offline setting, "information about quality differs from information about price because the former is usually more expensive to buy than the latter" (p. 311). In this sense, a product is also considered an experience good when the cost of information search is greater than experiencing the product directly.

2.1.1 Internal/ External Search

Consumer information search can be broadly categorized into internal and external searches (Bettman, 1979). An internal information search is one which involves individual memory and previous experience and is said to occur prior to an external information search effort (Peterson & Merino, 2003). External information search has been defined as "the degree of attention, perception and effort directed towards obtaining environmental data or information related to a specific purchase under consideration" (Beatty & Smith, 1987, p. 85). In addition, Schmidt & Spreng (1996) include information acquired but not specifically related to an imminent purchase, as part of a more comprehensive definition of external information search. In contrast to internal information search, which uses memory and prior experience as information sources, several types of information sources can be used in external search. Olshavsky & Wymer (1995) categorize these information sources as: marketer controlled, reseller information, third-party independent organizations, interpersonal sources, and direct inspection of the item(s) under consideration.

2.1.2 Pre-purchase Information Search

Pre-purchase information search can be characterized in the same way as the external search as defined by Beatty & Smith (1987) above. Indeed, in a pre-purchase context, information search centers on obtaining information to aid decision-making amongst options in relation to a potential purchase. Using the economic approach to external information search, put forward most notably by Stigler (1961), a pre-purchase information search can be viewed in a cost benefit framework. Here Stigler states that the chief cost of a search is time and that there is a reduction of search activities as the marginal benefit derived from continued search decreases. Moorthy et al. (1997) suggest that the benefit of search to a consumer comes from what the authors refer to as “problem framing” as well as “involvement” and the consumer’s level of risk aversion. Problem framing represents the consumer’s uncertainty amongst the different considered options (choice environment) while involvement pertains to the importance a consumer gives to a product category. Ultimately, the pre-purchase information search should serve to reduce uncertainty amongst options so as to quell a consumer’s aversion to risk. Uncertainty can be further classified as either choice or knowledge uncertainty, each having a different effect on search activities (Urbany, Dickson, & Wilkie, 1989). Uncertainty in choice intentions (choice uncertainty) relates to the ambiguity in selection of a particular product or brand, whereas knowledge uncertainty refers to ambiguity about the products or brands themselves and even the criteria on which to evaluate each option. Urbany, Dickson, & Wilkie (1989) found that choice uncertainty increased search activities while knowledge uncertainty was potentially associated with higher search costs which, in turn, are suggested to have a negative relationship with search activities.

The motivational/ psychological approach to pre-purchase information search considers ability and motivation to search as antecedents of search activities. In their model of external search, Schmidt & Spreng (1996) propose that an increase in both the motivation and ability to search positively affect external information search activities. Their model employs Stigler (1961)'s cost/ benefit framework by proposing that an increase in a consumer's perceived risk will increase the perceived benefit of search thus increasing motivation to do so, while an increase in search cost will negatively affect motivation to search.

2.1.3 Ongoing Search

In contrast to pre-purchase external search for information, which pertains to a purchase under consideration, ongoing information search is one where the information acquired is not necessarily related to an impending purchase. This type of search is defined as "search activities that are independent of specific needs or decisions" (Bloch, Sherrell, & Ridgway, 1986, p. 120) and is included in the definition of external search effort in Schmidt & Spreng's proposed model (1996). The distinction between pre-purchase and ongoing search is, however, difficult to distinguish in practice despite their conceptual difference, seeing as the activities involved appear identical when observed externally (Bloch et al., 1986). Despite the similarity between these two types of search, it is important to note that the motivations for pre-purchase and ongoing search are different. The motive in pre-purchase search are to make better purchase decisions, while ongoing search motives include building an information bank for future internal searches or for recreation (hedonic purposes) and could lead to future purchasing efficiencies (Bloch et al., 1986).

2.1.4 Offline/Online Search

In the offline setting of external information search, as we have seen above, sources of information can include advertising, product brochures and information on packaging (market controlled), catalogues and charts (reseller information), magazines, newspapers (3rd party independent organizations), word-of-mouth (interpersonal), and observation (direct inspection) of the product, product category or brand. In the online setting the sources of information are similar, albeit in electronic format, yet the online format offers a "vast number of alternatives that become available to consumers" (Alba et al., 1997, p. 41). In terms of the economics of information put forward by Stigler (1961), Bettman et al. (1991) further assert that higher availability of information in the environment will lower search costs. This exemplifies the online setting where an immense breadth of information is highly accessible and search costs are lowered substantially.

Online search also reduces search costs in other ways than the high availability of information, which is by offering consumers a way to have experience with a good prior to purchase. The capacity of the online setting to offer "virtual experience" provides enormous value to the consumer by allowing him to experience the product without actual ownership (Klein, 1998). As an example, currently in the online environment, most, if not all, music websites offer a consumer the ability to sample music tracks before purchasing them. The experience simulation through multimedia content creates a virtual experience for online shoppers. This, coupled with the ability of consumers to access the experience of others via online customer reviews, creates a setting where more attributes of a the product become searchable, in turn decreasing the difference between search and experience goods (Huang, Lurie, & Mitra, 2009).

2.2 Decision-Making Strategies

The choices consumers make regarding the selection, purchase, and use of a given product or service has been studied extensively in consumer behavior literature (Bettman et al., 1991; Bettman, Luce, & Payne, 1998; Howard & Sheth, 1969; Payne, 1976). According to Bettman et al. (1991) consumer choice is composed of alternatives, attributes and uncertainties. In turn, these affect the choice task complexity which can vary greatly between choices. One of the most important determinants of task complexity was shown to be the number of alternatives available (Payne, 1976). The number of attributes per alternative has also been shown to be a determinant in task complexity (Olshavsky, 1979) as well as the presentation of information (Bettman, 1979; Bettman et al., 1991). Task complexity is particularly important in decision-making studies as it has a demonstrated effect on the strategies used by consumers in formulating a choice (Newell & Simon, 1972; Payne, 1976). In the discussion of choice strategies used by consumers in a particular task environment, it is important to outline the assumption of limited information processing capacity of consumers.

2.2.1 Limited Cognition

The economic approach to information processing assumes "rational choice" theory (Bettman et al., 1998) whereby a decision maker is rational, with clear preferences that are independent of the attributes of the options. Additionally, this decision maker is assumed to possess the necessary skills required to calculate the value of the options, so as to select the most valuable one (Bettman et al., 1991). In contrast, other theories of decision-making, such as Bettman's (1979) approach, assume bounded rationality (Simon, 1955). Here decision-makers have limited information-processing capacity. They do not possess the ability to consider all the attributes of all possible options so as to be perfectly "rational" in selecting the best option. In this stream of thought, preferences arise more spontaneously, in response to a choice, rather than being clearly predefined (Bettman et al., 1991). In view of this limited information-processing capacity, decision-makers are posited to adopt simplifying choice strategies to reduce cognitive effort, hence the previously described relationship between task complexity and choice strategy selection (Newell & Simon, 1972; Payne, 1976).

2.2.2 Choice Heuristics

The limited information processing capacity of a consumer affects the chosen approach to the choice problem. Different decision strategies require varying amounts computational effort to execute as there are differences in the amount of information to be processed for each strategy. Ultimately, the choice of a strategy is a trade-off between the strategy's demand for cognitive effort and its ability to produce an accurate response (Bettman et al., 1990). The decision-maker must select heuristics, or rules of thumb, that allow him to evaluate the alternatives from which he must choose, as well as the criterion from which one alternative is selected from amongst the others (Bettman, 1979). Bettman (1979) asserts that a choice heuristics is also characterized by the type of information processing involved. These processing types will be developed further below, after an elaboration on some of the choice heuristics commonly employed by decision makers in faced with a choice problem.

Payne (1976) suggests that one of the earliest proposed types of choice heuristics is the additive model of choice. In this model, also known as the linear model, each alternative is evaluated separately with a value assessed for attributes of each alternative. These values are then summed and the alternative with the highest total value is selected. This type of heuristic is equivalent to the equal weight heuristic (EQW) described by Bettman (1979) and is considered an accurate simplification of the choice process. A variant of the additive model is the weighted additive rule (WADD) whereby the value given to each attribute is multiplied by a weight, which represents the importance of the attribute to the decision-maker, before summation to discover the preferred option. This approach, however, requires more computational skills then the EQW heuristic.

The principle of satisficing (Simon, 1955) revisits the concept of a consumer's bounded rationality. The decision-maker establishes a cutoff level for each attributes of an alternative and the attributes for each alternative are inspected in the order they appear in the set. When one of the alternative's attributes does not meet this pre-determined level, the alternative is removed from the choice set at that moment. With this approach, however, there is no comparison between alternatives of their relative values. This is similar to the conjunctive model of decision-making described by Payne (1976), when an alternative must surpass a set standard for all relevant attributes.

Another type of decision strategies proposed by Tversky (1969) is the additive difference model. Here, the difference on individual attributes for each of the alternatives in the choice set are determined and the results summed to choose the best option. A variant of this strategy is the lexicographic heuristic (LEX) elucidated by Bettman (1979). This heuristic evaluates options based on their attributes, but establishes which of the alternative's attributes are most important to the decision-maker for the order of comparison. When one alternative is favored over the others on one of these attributes (by order of importance), it is selected from the choice set.

The elimination-by-aspect (EBA) heuristic first proposed by Tversky (1972) is remnant of the satisficing heuristic in that a minimum cutoff for attributes of alternatives must be established. It differs, however, in that the decision-maker must first determine the most important attribute. Following the establishment of order of importance, all alternatives that do not meet the cutoff for the most important attribute are eliminated from the choice set. The process is repeated for the next-most important attribute until only one alternative remains.

Perhaps the simplest decision heuristic that can be adopted is the affect referral strategy (Wright, 1975). In this strategy, a decision maker does not evaluate the attributes of each alternative but rather performs an internal information search from memory to evoke previously determined evaluations or preferences for each alternative. This approach exemplifies a "choose the best" criterion of a decision strategy (Bettman, 1979) .

There are many other decision heuristics that exist but for the purposes of this study, the ones presented above suffice in illustrating the various amounts of computational ability required by various strategies. Interestingly, these models of decision strategies can be used in a complementary fashion in function of the demands or complexity of the decision task (Payne, 1976). This approach has been referred to as phased strategies (Bettman, 1979) or combined heuristics (Bettman et al., 1991) and consists of a decision-maker using a certain type of heuristic in a first phase to eliminate alternatives from the choice set and then another strategy for the second phase, making comparisons amongst a smaller choice set. The selection of choice heuristic(s) can be a matter of preference; however, some determinants of choice heuristics selection can be generalized.

2.2.3 Determinants of Choice Heuristics Selection

As previously discussed, the limited information-processing capabilities of a decision maker mean that the complexity of the task influences the decision heuristics chosen in terms of the amount of information processed to arrive at a preferred option in a choice set (Payne, 1976). Here, the relative advantages and disadvantages of a given strategy will vary according to the choice environment. Other determinants such as experience and prior knowledge can also affect the decision strategy selected (Bettman, 1979).

A decision-maker is assumed to have a stored bank of strategies for selecting a preferred option in a choice set, which may have been gained through prior experience (Bettman et al., 1998). Lacking the prior experience for selecting an appropriate choice heuristic may result in the consumer constructing a strategy. This can be accomplished either by using elements of strategies developed for other products, external information search for the product class involved in the choice problem, or experiencing the product via consumption for future use in decision heuristics (Bettman, 1979). Prior knowledge is also useful in determining specific choice heuristics as it can help a consumer decide which information regarding the product is most relevant to the decision task. Alba & Hutchinson (1987) describe these prior knowledge and experience components as expertise and familiarity and assert that an increase in familiarity results in an increase in expertise.

Decision heuristics are also selected based on their ability to accomplish the goals of a consumer (Bettman, 1979). Bettman et al. (1998) propose four important goals for decision makers, where the first is maximizing the accuracy of choice, the second is minimizing the cognitive effort required in making the decision. As stated previously, the selection of a choice strategy is often the result of the trade-off between these two goals (Bettman et al., 1990). Interestingly, some studies have postulated that strategies aimed a cognitive simplification can maintain a high level of accuracy while reducing effort, while others have stated that effort-saving heuristics can lead to errors (Payne, Bettman, & Johnson, 1990). The third goal is the minimization of negative emotions experienced when making a choice, seeing as some decisions can involve tough trade-offs between aspects of the options. Finally, the fourth goal revolves around maximizing the ability to justify the decision. This justification can be to the decision-maker himself or to others as they evaluate the choices made.

Overall, decision heuristics vary in their capabilities of accomplishing the goals of the decision-maker in a given choice task (Bettman et al., 1991). The capacity for these strategies to fulfill the stated goals may be a function of the decision-maker's prior knowledge and experience and computational aptitudes. In view of these limitations, a consumer then selects the strategy for the given choice environment, according to its perceived ability to best meet his goals.

Each of the aforementioned choice heuristics employs varying types of information processing which distinguishes them in terms of the cognitive effort required to successfully employ them. Below we will expand the discussion on the types of information processing possible when making a purchase decision.

2.3 Information Processing Types and Related Heuristics

As pointed out by Bettman (1979), decision strategies are common to a multitude of disciplines and as such have been described in varying manners with different proprieties. Common to these descriptions of various decision-making strategies is the underlying properties of the type of information processing involved. The properties most relevant to the heuristics described above are discerning the strategy as compensatory or noncompensatory, whether it comprises selective or consistent processing and if it employs processing by attribute or by alternative.

In compensatory processing, a weak value on an attribute deemed highly important can be compensated for by a high value on an attribute that is seen as less important (e.g., less quality could be compensated for by a lower price). In noncompensatory processing, no compensation mechanism is used (e.g., less quality than expected would mean eliminating the alternative from the choice set). It has been suggested that decision-makers may find making these trade-offs emotionally difficult (Hogarth, 1987) and that this type of processing is costly in terms of cognitive effort (Bettman et al., 1991).

2.3.1 Alternative-Based versus Attribute-Based Processing

Examination of sequences of information acquisition from an information display during external information search have revealed two type of information acquisition, either by alternative or by attribute. In alternative-based processing, the information on multiple attributes of an alternative is obtained and considered before moving to the next alternative. Conversely, in attribute-based processing, information is obtained on a single attribute for multiple alternatives. To demonstrate the difference, consider a consumer who is shopping for a new computer tower on the Dell website. If the consumer is acquiring information via alternative-based processing, when viewing the list of tower models available and all of their specifications, he would then be obtaining information regarding the processor speed, memory capacity, hard drive space, etc. for a single tower model before moving to the next model for comparison. In contrast, if the consumer is acquiring information through attribute-based processing, he would investigate a single attribute of a first tower model, for example processor speed, before moving to the next model to examine the same attribute for comparison. Table 1 below illustrates the various decision heuristics previously discussed, categorized according to the type of information processing.

	Compensatory	Non-compensatory
Alternative -based processing	• Weighted additive rule • Equal weight heuristic	• Satisficing • Conjunctive heuristic • Affect referral heuristic
Attribute-based processing	• Additive difference heuristic	• Lexicographic heuristic • Elimination by aspect

Table 1: Example of decision heuristics according to processing types adapted from Bettman et al. (1991)

Interestingly, it has been asserted that the format of the information display strongly affects the type of information processing employed (Bettman, 1979). Furthermore, many foundational decision-making theories postulate a sequential shift in the type information-processing by a consumer when making a choice (Howard & Sheth, 1969; Newell & Simon, 1972; Payne, 1976). In this case, the consumer first assumes attribute-based processing to screen out certain options and then switch into alternative-based processing to evaluate the remaining alternatives in the choice set for a final selection. In contrast to this notion of sequential shift between these two information-processing types, a more recent online study by Shi et al.(2013) demonstrated a “high incidence of switching between acquisition states” (p. 10). It was noticed, in the study, that participants limited attention to roughly three attributes for an alternative and about two alternatives for a single attribute. Furthermore, the experiment revealed that the information collected on attributes induced switching away from alternative-based processing while information collected on alternatives induced switching away from attribute-based processing. This suggests that instead of the sequential shift in information processing from attribute to alternative-based as previously stated, consumers may sample parcels of adjacent product and attribute information (Shi et al., 2013).

Product comparisons at the heart of decision strategies are preceded by information seeking activities, whereby a consumer forms a choice set. It has been suggested that, like information processing, these information seeking activities also change as consumers refine their information requirements (Rowley, 2000). In the following section, these activities will be reviewed in more detail to further explore the issue.

2.4 Search versus Browse Online Information Seeking Activities

As mentioned earlier, two main types of online seeking activities have been identified: browsing and directed search. Browsing is a seeking activity that is associated with situations in which the consumer is uncertain about the information available and is unsure whether his shopping requirements can be met, hence seeking out information in an exploratory fashion (Detlor et al., 2003; Rowley, 2000). In the case of directed search, the consumer has fairly specific requirements (Rowley, 2000) and is actively seeking out information with the intent of making a decision (Detlor et al., 2003). In this sense, directed search is more goal-oriented than browsing activities.

The goal-orientation of a consumer performing an online seeking activity is important as it can point to the type of information processing employed. Chernev (2003a) postulated that consumers with clearer preferences are more probable to use an ideal attribute combination when evaluating alternatives. Here, the ideal attribute combination represents a combination of product characteristics that best represent the preferences of the consumer and hence indicative of information processing by alternative. In contrast, those without these clear preferences or ideal attribute combination to compare alternatives, are more probable to use attributes of various alternatives for comparison (Simonson & Tversky, 1992) indicating information processing by attribute. Essentially, it would seem that those with a clear goal in mind when searching are more likely to use alternative-based processing whereas those that do not seem to favor attribute-based processing. In addition, Detlor et al. (2003) remarked that consumers who were in a directed-search mode “preferred detailed product information” (p. 81) in terms of product specifications, although it is unclear if this indicates a preference for alternative-based processing.

Rowley (2000) suggested that consumers refine their strategies and information requirements as they consider information gathered throughout the search process. This refinement may cause a gradual shift from an exploratory browsing mode to a more focused directed search (Shim, Eastlick, Lotz, & Warrington, 2001). The viewpoint of phased information seeking activities seems analogous to previously described phased strategies or combined heuristics (Bettman, 1979; Bettman et al., 1991) whereby one decision strategy is first used to eliminate alternatives and then another strategy adopted to compare the remaining options in the choice set. In a more recent study, Montgomery, Li, Srinivasan, and Liechty (2004) propose a model of web browsing that accounts for the two states of navigation, browsing and directed search. Their model acknowledges that a user may switch between these two information seeking activities many times during a visit to a website “depending on the user’s current goals or state of mind” (p. 584). The proposed dynamic change between browsing and directed search departs from the notion of sequential shifts from one mode to the next and seems tantamount to the observed switching between information processing types (Shi et al., 2013) previously described.

The relationship between information seeking activities and information processing types has not been clearly demonstrated in an online context, yet the above mentioned parallels hint at a possible relationship. To further explore the phenomenon in an online pre-purchase information search context, the following hypothesis is proposed:

H1: In an e-commerce setting, users engaged in proportionally more time on directed search activities will adopt alternative-based processing to a greater *degree than users engaged in proportionally less time on directed search activities.*

H1a: Users engaged in proportionally more directed search activities will consider more attributes per alternatives than users engaged in proportionally less directed-search activities,, indicating a greater degree of alternative-based processing.

H1b: Users engaged in proportionally more directed search activities will revisit attributes of the same alternative more than users engaged in proportionally less directed-search activities, indicating a greater degree of alternative-based processing.

2.4.1 Antecedents of Information Seeking Activities

Certain characteristics of a website affect the way in which information is searched and processed by a user. These characteristics include the format of the information displayed, meaning how information is organized on screen, the quality of the website itself and the previous experience a user has with the website. Below is a detailed review of previous experience with a website and its impacts on information processing and searching activities, seeing as it is a topic of investigation in the present study. The information display format and website quality, for their part, are outside the scope of this study.

2.4.1.1 Experience with websites

The cognitive costs of decision making relate to the costs of making sense of various information sources and considering information gathered (Payne, Bettman, & Johnson, 1993). In the online environment, browse and directed search reflect the cognitive processes at work seeing as "different types of information are associated with different cognitive processes that affect the way information is acquired, the amount of information acquired, and the time spent processing each piece of information" (Huang et al., 2009, p. 55).

In this regard, it has been asserted that cognitive costs involved in using a website decrease with experience. This is reflected online by users that appear to become more efficient the more they use a site, a phenomenon referred to as the power law of practice (Johnson et al., 2003). Results from the study, which used clickstream data, showed that visit duration decreased as users repeated visits to a website, suggesting an increase in efficiency over multiple visits. Another study using clickstream data, by Bucklin and Sismeiro (2003), suggested that in subsequent visits to the same websites, users may be able to arrive at pages of interest faster than inexperienced users. Here, efficiency gains were reflected by users needing less total pages to complete a search task. This demonstrates what the authors refer to as a “spill-over” effect as users carry forward knowledge acquired from a previous visit to a site, to the subsequent visits.

It is important to underline that neither of the above mentioned studies investigates the changes in the time dedicated to either browsing or directed-searching types of information seeking activities. The efficiency gained by a user upon repeat visits to a particular website is quantified, in these studies, by fewer page views and lower overall visit durations. It has been asserted that in terms of information seeking activities, directed-search is a more efficient form of information seeking activity than browsing (Janiszewski, 1998), whereby users can arrive more quickly to result pages containing relevant information sought after. This reinforces the observation that users are able to arrive at pages of interest faster as they gain experience using a website. As an example, many people use Amazon.com as a homepage to search for goods they would like to purchase, with the site averaging 76.1 million U.S. visitors per month in 2012 (The Guardian, 2012) . Between 2011 and 2012 the site saw a 73% growth in product searches (Miller & Clifford, 2012) indicating that seasoned users may be executing more directed searches for the things they would like to buy, exemplifying the previously discussed “spill-over” effect.

With regards to the way in which cognitive costs affect information seeking activities, Rowley (2000) suggests that browsing may be preferred over directed search in instances where “the cognitive burden, including what the user needs to know about how to search, and how to search a specific system, is less than it might be for directed searching” (p. 25). This, in turn, implies that as cognitive costs are lowered with repeat visits to a website, the decreased cognitive burden may favor an increase in directed-searching activities. Additionally, Rowley (2000) states that when the search goal is not well defined, browsing behavior is a preferred method of information seeking. As such, consumers may start with exploratory browsing and then progressively move towards goal-directed search with a more targeted focus, as they refine their information needs (Shim et al., 2001). This amalgamation and evolution of information seeking activities may, in turn, lower cognitive costs for users (Detlor et al., 2003)

In contrast to the clickstream studies mentioned earlier which describe site and session level user activity, this study attempts to fill the gap related to the proportions of time devoted to browsing or directed searching during a page view. In this way, a more detailed account of the way in which users gain efficiency with repeat site visits can be investigated. Recall that the cognitive costs of using a website decrease with experience and efficiency gains result in less page views. This, along with the assertions that directed search is a more efficient form of information seeking and that users refine their information needs marked by transitions between exploratory browsing and directed search, it is proposed that:

H2: In an e-commerce setting, repeat visitors to a site will engage in proportionally more time on directed-search activities than new visitors.

2.5 Research Model

The hypotheses previously presented are summarized in the research model below to demonstrate their inter-relations. A user's experience using a website (through repeat visits) is proposed to have a positive relationship with the time spent on directed-search activities (H2). In turn, it is suggested that the proportion of time spent on directed-search activities is positively related to the degree of alternative-based processing employed by a user (H1).

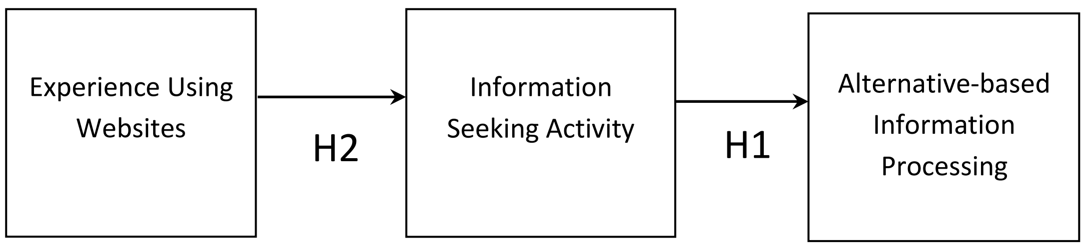


Figure 1: Research model with hypotheses

Chapter 3: Methodology

The objective of this study is two-fold. The first is to assess the relationship between online information seeking activities and the processing of the information found. The second is the examination of the effects of repeat visits to a website on the proportions of time spent on either browsing or directed searching information seeking activities. In this chapter, a short review of eye-tracking and the methodological strategy used for the experiment is first discussed, followed by the presentation of the experimental design and protocol. Subsequently the tools used for data collection are discussed and finally, the operationalization of psychometric and eye-tracking measures, are presented.

This project has been approved by the HEC Montreal's Ethics Committee, under the project name "A Neurophysiosiological Perspective on How Consumers Respond to Well-Known Vs. New Websites: Phase 2", on December 1st, 2012. The submission included approval for gathering data from human subjects and the accompanying privacy statements (see appendix I).

3.1 Methodological Strategy

To meet the stated objectives of the study, an experiment was conducted in a laboratory setting. The accurate measurement of eye movements was of paramount importance in this study as its reveals the type of information processing employed (Shi et al., 2013) as well as the type of information seeking activity taking place. In order to track the eye movement patterns of participants while navigating websites, in the context of online product selection, sensitive eye-tracking equipment must be used in a controlled environment, which makes this setting ideal. Furthermore, the laboratory experiment allowed tracking of repeat visits to a website which has a mediating effect on information seeking activities, according to the literature. Additionally, this setting allowed for equable measurements across all study participants as they were made to use the Internet Explorer browser to carry out site visits. This ensured that all websites selected for the experiment would display uniformly for each participant.

3.2 Experimental Design

The study is based on a single-factor, two treatment design so as to compare responses between treatments (Duchowski, 2007). The treatments used here were between subject, being either inter-website (visits to different websites) or intra-website visits (repeat visits to the same site). In this way, the hypothesized effect of repeat visits as an antecedent of information seeking activities could be validated by comparing the changes in proportions of these activities between the first and last site visits, and how these changes differed between the two treatments. Eye movement data was recorded throughout the course of the experiment tracking the visits of participants in both groups.

3.2.1 Participant Recruitment

In the context of this study, it was important to select participants that had no prior experience with online music purchase, in view of the experiment's goal to observe user information search behaviors and their evolution over multiple site visits. Although there were no specific inclusion criteria other than being of legal age, the following exclusion criteria were used in the selection of participants:

- Prior experience with online music purchase – Seeing as the goal of the experiment is to observe search behaviors in the context of online music purchase, it is possible that participant may exhibit different search habits if there is an experience bias. This exclusion does not pertain to participants having downloaded music freely or having made previous online purchases other than music.

- Needing glasses to view websites – The eye-tracker works by firing infrared light pulses on the eye and captures the reflection off the cornea and the pupil with a camera, so as to infer the direction of the gaze; this is known as the Pupil Centre Corneal Reflection (PCCR) technique. Glasses can obstruct the eye-tracker's reading of the corneal reflection, rendering it inaccurate.

- Having a neurological diagnosis – In view of the above mentioned flashing infrared pulses from the eye-tracker, it is possible that certain neurological conditions may be exacerbated by it. As such, it is prudent to exclude these participants.

For recruitment, a call was made to both undergraduate and graduate students of HEC Montreal, as well as anyone else of similar age and educational background. Participant recruitment was completed largely via the HEC Student Panel but also through direct solicitation by the research directors, lab technicians and the researcher. By targeting this participant profile, a certain level of homogeneity in the sample could be reached in relation to prior web experience and habits, so as to reduce individual differences in navigation during the experiment, although this could not be assured. Participants registering through the HEC Student Panel were able to select timeslots according to their availabilities and those of the lab. A financial compensation was offered in the form of an Amazon.com gift certificate with a value of $40, given to participants directly after having completed the experiment. The recruitment effort resulted in a sample of 48 participants, of which 10 did not present themselves at the scheduled timeslot, leaving a final sample of 38 participants to complete the experiment. Reasons for participants having missed their scheduled timeslots varied but mostly were due to having forgotten or having mistaken the timeslot. To minimize this occurrence, participants were given reminders via a call 48 hours before their scheduled timeslot and an email to the same effect, sent 24 hours beforehand.

3.2.2 Website Selection

In this study, music tracks were selected as the type of product from which participants would have to choose. Music tracks are experience goods and the use of the web medium to search for these types of goods offers the possibility for virtual experience, in turn reducing the difference in search costs between these and search goods (Klein, 1998). Furthermore, the attributes for music tracks are homogeneous and are presented in a consistent horizontal format across music websites, making for stable regions of interest used to capture eye-movement data when arriving at a results page. Finally, the cost of music tracks is stable throughout various music sites (usually around one dollar) meaning price sensitivity is not a factor in the decision-making process, which focuses more on experience attributes.

For the experiment, seven music websites were selected according to three criteria: first, the websites had to provide the ability to purchase and subsequently download a single music track; second, the websites had to make their services available to Canadian consumers. In addition, three web experts were asked to complete a purchase on each candidate website and complete an evaluation using an adapted version of the WebQual scale (Loiacono, Watson, & Goodhue, 2002) using a Likert-type scale from 1 to 7 where 1 is the weakest rating and 7 the strongest. This follows the recommendations of Mack and Nielsen (1994), who advise the use of three to five experts for usability evaluations. Between the three web experts an inter-rater reliability of 0.603 was reached (see appendix IV), which is considered to be a moderate strength of agreement (Landis & Koch, 1977). Below is a table of the final website selected to represent the spectrum of website quality ratings.

Site name	URL	Website Qual.
7 Digital Canada	http://ca.7digital.com/	6.22
Archambault ZIK	http://www.archambault.ca/musique-mp3-zik-ZIK-fr-ct	4.67
Artistxite	http://artistxite.com/ca/index.html	4.67
Beatport	http://www.beatport.com/	6.78
CDbaby	http://www.cdbaby.com/	6.44
Fairshare	http://www.fairsharemusic.com/	6.78
Othermusic	http://www.othermusic.com/	4.33
Palmares	http://www.palmares.ca/content/	5.67

Table 2: List of websites selected for the experiment

Note that although the music website Othermusic.com was originally part of the seven websites selected, a drastic change in the website's user interface early in the experiment required it be pulled from the list as the website quality score was no longer valid. The site was replaced by Archambault ZIK, seeing as this site was evaluated by the three expert judges to be equivalent to the original Othermusic.com site (before the update), in terms of website quality on the WebQual scale.

3.2.3 Eye-tracking and Information Processing

Process-tracing approaches have been used in studies on decision-making (e.g. Jacoby, Chestnut, Weigl, & Fisher, 1976; Payne, 1976; Payne, Bettman, & Johnson, 1988), where the study authors try to measure the decision process directly without interfering it. A variety of process-tracing techniques exist such as verbal protocols, information display boards and tracking eye movements. In the past, eye-tracking technologies have been criticized for their obtrusive and expensive apparatuses, which restricted a subject's head movements and difficulty in localizing eye movements (Bettman, 1979). Today, advances in eye-tracking have rendered the apparatuses unobtrusive and virtually unnoticeable to a user whose eye movements are being captured. As well, the data yielded from these types of experiments is vastly more accurate than previously and allow detailed analysis of captured eye movements. Eye movements are relatively effortless and so encourage information acquisition from the stimuli. In contrast, other process tracing techniques (such as verbal protocols) require relatively more mental effort and may encourage use of information already stored in memory hence becoming unobservable in an experimental setting (Russo, 1978). In view of these improvements in eye-tracking and the ability to observe information acquisition without disturbing the information search process, this is the method elected for this study. Below is a description of the properties and use of this technology.

3.2.3.1 Eye Movements and Eye-tracking

In order to further elucidate the utility of eye-tracking tools and measures, it is important to briefly describe eye movement types and the technology used to record them. Rayner (1998) makes an excellent summary of eye movements and their cognitive implications. Eye movements generally consist of two types: saccades and fixations. Saccades are rapid eye movements during which sensitivity to visual input is reduced. Fixations occur between saccades, when the eyes remain still for 200-300 ms. The visual field consists the fovea, parafovea and peripheral regions. The fovea consists of the central 2° of the field of vision, where visual acuity is the highest. The parafovea extends 5° outward from either side of the fixation and visual acuity drops significantly from the fovea. The peripheral region lies beyond the parafovea to complete the visual field and acuity is lowest in this region.

The limitations of our visual field dictates eye movements as we look to derive more information from a particular stimulus. By placing the foveal region of vision on a stimulus we can see it clearly and get the most visual information available. Saccades are made to stimuli in the parafoveal or peripheral region of the visual field to determine if these should become the new focus of the foveal region for greater information (Rayner, 1998). Research has shown that two separate neural pathways are involved in object localization and identification (Ungerleider, 1982) and produce different eye-movement patterns. Seeing as humans have limited-information processing capabilities, attentional mechanisms are needed to select relevant information from the field of vision. This “where” (localization) and “what” (identification) in a visual stimulus requires us to focus attention on one or the other (Van Der Lans, Pieters, & Wedel, 2008). This can be useful when trying to derive the cognitive state via eye movements with more dense fixations during localization (Van Der Lans et al., 2008).

Information acquisition processes, such as the information processing types seen earlier, are “latent cognitive states that direct the eyes in a search for information on the display” (Shi et al., 2013, p. 2). Wedel and Pieters (2000) caution that eye movements are indicative of these states in a way that is probabilistic more than deterministic. In so far as the mechanism involved in switching between the two modes of information processing (alternative or attribute based), it seems to be the result of sampling of bits of information by the decision maker. It is interesting to note that Shi et al.(2013) underline the fact that information sampled is contiguous on the display. In this sense the eyes do not need to travel very far to fixate on the next meaningful piece of information to aid decision-making.

3.2.3.2 Area of Interest Coding

Areas of interest (AOIs) are defined as "rectangular regions of interest that represent units of information in the visual field" (Salvucci & Goldberg, 2000, p. 75). These AOIs use a duration threshold to distinguish fixations from passing saccades within the defined region, which was parameterized at a minimum of 100 milliseconds in this experiment. This parameterization is in line with the assertion that fixations are "rarely less than 100 milliseconds and most often in the range of 200-400 milliseconds" (Salvucci & Goldberg, 2000, p. 72).

The AOIs in this study were coded onto both static and dynamic recordings of participants using Tobii Studio software (Tobii Technology AB, Danderyd, Sweden). This was in response to the fact that Tobii studio was not able to make static images of all the pages on the websites, due to a large number of flash elements being present. On static screenshots of the websites, areas relating to browse or search were coded in accordance with Detlor et al. (2003)'s definition of directed search and browsing. Accordingly, areas that were related to searching included the website's search tool as well as areas where a user showed a predetermined preference, such as searching for music using a specific genre (e.g., jazz, classical). In contrast, browsing AOIs were defined as areas of information search that showed no predefined preferences, such as a site's "new releases" or "staff picks" sections. In addition, result pages with information pertaining to a user's search criteria were coded as result lists, so that the direction of the gaze could be observed on these listings (see appendix VI).

In the case of dynamic participant recordings of website visits, dynamic AOIs were used to capture eye-movement data. AOIs were coded with the same criterion as those used for static images in relation to browse, search and results listings. These dynamic AOIs had to be resized and shifted to match a participant's navigation while scrolling through webpages. Since all AOIs on a dynamic recording must be present throughout the recording, when participants visited new webpages, certain AOIs had to be activated while others were de-activated. This was done so that only AOIs relevant to the current page viewed would capture eye-movements. To illustrate this point, on the opening page of a music site, active AOIs included those for browsing and searching while those pertaining to results listings were de-activated. When arriving at a results page, the results listings AOIs were activated while those for browse and search were made inactive.

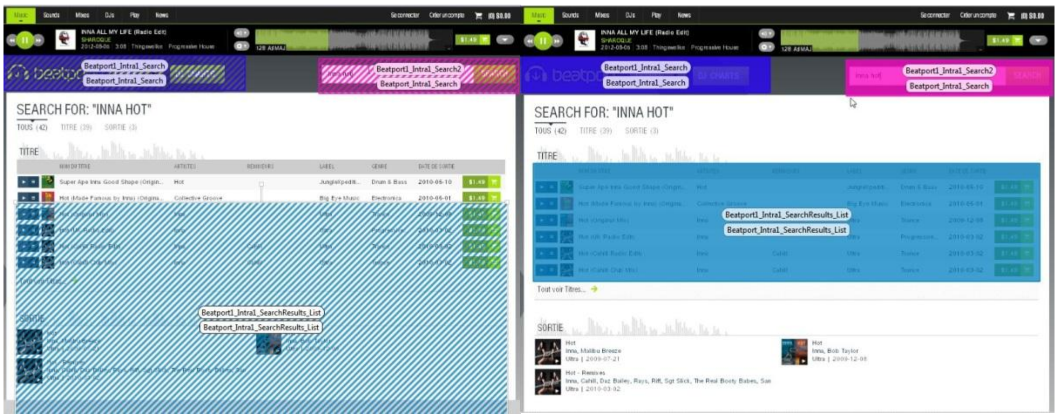


Figure 2: Illustration of dynamic AOI activation process; AOIs are resized and repositioned, to match user scrolling, before being activated.

To ensure AOIs captured all of the necessary elements of information seeking activities, various classes of search and browse AOIs were coded for each specific region. For example, AOI classes included “browse new releases” or “browse staff picks” and “search main site” as well as “search genres”. Classes were created for each type of searching and browsing activity possible on the website until no new classes of either could be added. At this point, AOIs were grouped into the overarching categories of browse and search for later data export from the application. It is important to note that although the AOI classification scheme was completed by a coder, there were a multitude of meetings with the research team to discuss the results of the AOI coding. These discussions allowed for the validation of the steps taken in coding the AOIs and ensured the uniformity of the classes assigned.

3.3 Experimental Protocol

3.3.1 Experimental Process

The experimental protocol in this experiment was built upon a similar protocol used by Senecal, Léger, Fredette, and Riedl (2012). In their study, a two treatment design was used, whereby one group performed multiple visits on different music websites and the other performed an equal number of repeat visits to the same site. Additionally, the websites retained in the present study were selected based on the same criterion as their experiment. Although the goal of their experiment differed from the goals of this one, the protocol was judged ideal in terms of being able to measure information seeking activities and processing as well as the effect of repeat visits to a website, in the present study.

Before starting the experiment, participants were asked to sign a research consent form and complete a questionnaire outlining the steps they would take to complete the task of purchasing a music track. As well, participants were asked before the experiment, to make a list of 10 songs they would like to purchase during the experiment. The participants were then informed, at the beginning of the experiment that they should not attempt to purchase any of the songs included in their list. This was done so as to reduce the amount of predetermined preferences for certain music tracks, before starting the exercise. Following this, the participants were asked to complete the task of making music purchases on the predetermined websites using the Internet Explorer browser. It is important to note that actual purchases were not, in fact, carried out seeing as the process of entering payment information and downloading each song locally proved to be too time-consuming to fit in the limited duration of the experiment. Instead, participants were asked to put selected songs in the site's "shopping basket" without completing the final checkout, as this would have no incidence on the nature of the experiment or its results. A multitude of studies on information search and the decision-process have used similar product choice decision to assess decision making (e.g. Chernev, 2003b; Jacoby et al., 1976; Payne, 1976; Shi et al., 2013).

Participants were divided into two groups, one being the intra-website visitor group and the other being inter-website visitor group. The participants in the intra-website group were made to visit the same music website seven times, making a simulated product selection of a single track on each visit. For the inter-website visitor group, participants were made to visit seven different music websites and complete a simulated product selection for each site. The websites visited for the inter-website group were randomly ordered for each participant.

There was a possibility of a "spill-over" effect in terms of predetermined song preferences whereby a participant could select a song that was considered but not selected in a previous visit. The inclusion of inter and intra website visitor groups in the experimental protocol could control for the possibility that repeated consecutive visits to a site might affect subsequent visits. To this end, the "spill-over" effect could be distinguished from the effects of repeat visits, seeing as the phenomenon could apply equally to both participant groups, yet the effect of experience gained from repeated visits would apply only to the intra-website visitor group.

3.3.2 Tools for data collection

The primary instrument used for data collection was the Tobii X60 eye-tracker (Tobii Technology AB, Danderyd, Sweden), which recorded participant eye-movements throughout the experiment. Additionally, the Tobii Studio software was used to store the tracking data as well as the mouse-clicks accompanying them. Before the start of each experiment, the eye-tracker was calibrated for each participant to ensure the most accurate readings possible.

Tobii Studio was used to design the sequence of sites each participant would visit. For the inter-site group, a total of 16 different sequences with a randomized site order were parameterized in the application. Additionally, 2 more sequences were created for the intra-site visitors so that the same website could be repeated for multiple visits (see appendix V). These 2 sequences were made using two different websites for repeat visits, with varying website quality ratings so that the effects of a particular site's quality over another could be excluded as a rationale for changes in the information seeking behavior of participants. Once the experiment was initiated, users visited each site via Internet Explorer, which displayed automatically with the preset website from the sequence selected in Tobii Studio. In between each visit a black screen was displayed with white text indicating instructions for the next visit and advising users to close their eyes to rest for 2 minutes so as to avoid fatigue during the experiment.

3.3.3 Operationalization of the Variables

Tobii studio offers a plethora of interesting measurements relating to eye-movements of participants during the experiment. Below is a description of the variables and measures used to evaluate information search behavior.

Alternative-based processing: consideration of attributes of an alternative

In order to compare the degree of alternative-based processing employed between participants, the visual sweep length is used as a proxy for this type of information processing. These visual sweeps are subsets of the overall scanpath.

The scanpath theory first advocated by Noton and Stark (1971), observes the sequence of fixations when viewing a pattern. Foulsham et al. (2012) defined the scanpath as an ordered sequence of fixations, according to the fixations' x and y coordinates, made in a particular viewing. As mentioned above, scan paths are said to contain multiple "sweeps", which are defined as a sequence consisting of saccades that move in the same direction, and fixations which are the endpoints to these saccades (Aaltonen, Hyrskykari, & Räihä, 1998). The direction of the first saccade in the sweep defines the direction for the entire sweep. In terms of the saccades involved in a given sweep, Shi et al. (2013) identify alternative-based saccades as a jump between attributes of a single product.

For the experiment, the measure of alternative-based processing was calculated using horizontal sweep length because all websites used in the experiment presented alternatives (songs) horizontally on their result pages (Figure 3), meaning rows of alternatives, with each row composed of the alternative's attributes (song title, artist, album, etc.). It has been asserted that longer saccadic amplitudes are indicative of a stronger mental representation of the pertinent components of the task (Goldberg, Stimson, Lewenstein, Scott, & Wichansky, 2002), in this case being the attributes of a given alternative. This being the case, horizontal sweep length offers a comparative measure of how many attributes are considered as the participants sweep across the attributes for an alternative being considered. Those with longer sweeps are considered to employ alternative-based processing to a greater degree than participants with shorter sweeps.

Alternative based processing: revisits on attributes of an alternative

The number of sweeps for a participant was considered as a measure of revisits on the attributes of a given alternative, since a greater number of saccades have been shown to indicate more searching (Goldberg & Kotval, 1999) across the attributes of an alternative. In this way, a greater number of sweeps could indicate a higher degree of alternative-based processing.

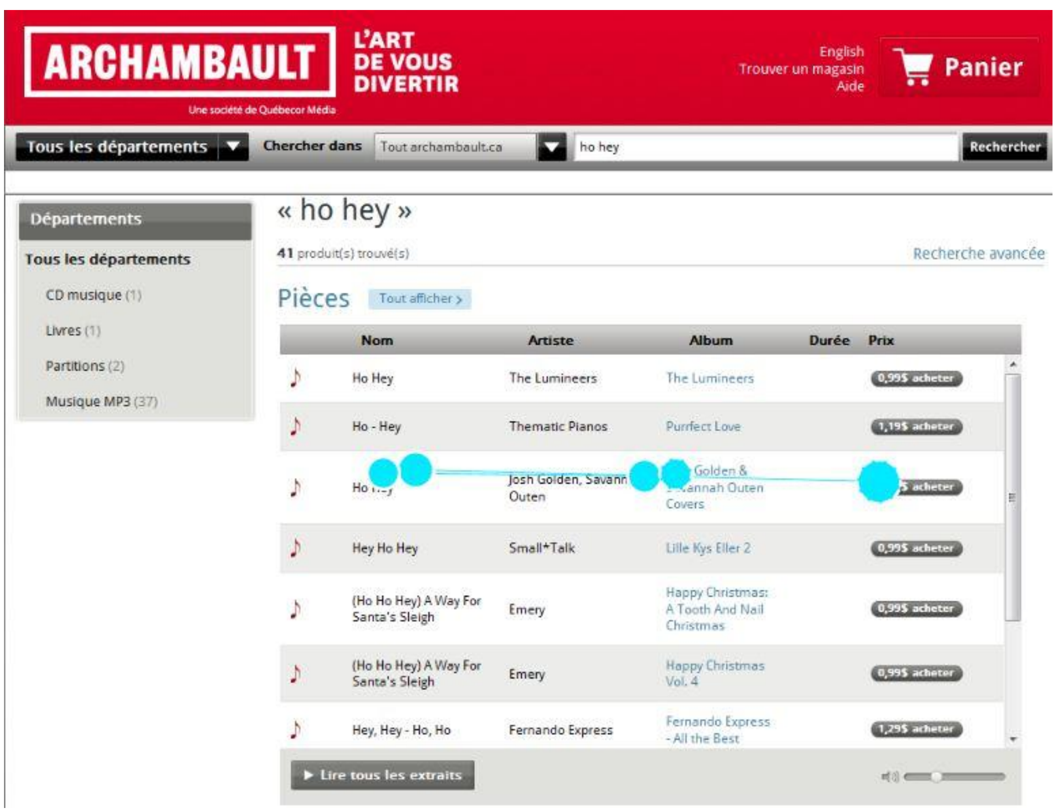


Figure 3: Gazeplot demonstrating a series of horizontal sweeps across attributes of a song.

Horizontal sweeps across result listings were calculated by isolating the x and y coordinates of successive fixations with a maximum height of 40 pixels (equivalent to 1 centimeter) which is the height of one alternative in the list of results. The height of one alternative was equal throughout the result listings on all the music sites visited. Once these coordinates were isolated, saccade length was calculated by the change in the x coordinate of successive fixations running in the same direction. The result was a sweep length, in pixels, as well as a number of fixations per sweep, and the number of sweeps for a participant. A minimum of three fixations per sweep was specified so as to have at least two saccades in each sweep. Because of the use of both static and dynamic AOIs in this experiment, vertical sweeps were not included as the change in the Y coordinate could not be reliably calculated due to the resizing and shifting of these AOIs.

Information seeking activities: browse & directed-search

In order to evaluate the proportions of information seeking activities, being either browse or directed-search, the total fixation time as well as the visit count on AOIs defined in the Tobii studio software suite were used.

Total fixation time, also known as total dwell time (Salvucci & Goldberg, 2000), has a starting and endpoint within a given area. Tobii studio defines the total fixation time as the sum of the duration of all fixations within a specific area of interest during the course of a viewing episode. Dwell time within an AOI is valuable in explaining collections of fixations on specific visual targets. In this experiment, total fixation time on browse as well as search category AOIs was used.

The visit count is a measure available in the Tobii studio application and measures a visit from the first fixation on the AOI to the next fixation outside that AOI, with the parameterized minimum threshold for a fixation being no less than 100 milliseconds. Each time a fixation within a region is followed by another fixation outside that region the visit counter is incremented by one. This measure can be used to corroborate and compare concentration of fixation time within a given AOI. Like the total fixation time, the visit count was collected on both browse and search category AOIs.

Experience using a website

The measure of the effect of experience using a website on information seeking activities was evaluated using the total fixation time on directed-search and browse type AOIs. The proportions of fixation time on search AOIs was compared between the first and last site visit to examine changes in search behavior.

Variable	Measure	Description	Source
Consideration of attributes	**Sweep length**	The sweep length is used as a proxy to indicate more attributes verified for an alternative.	Foulsham et al. (2012) Aaltonen et al. (1998)
Revisit on attributes	**Number of sweeps**	The number of sweeps indicates a greater number of revisits on the attributes of an alternative.	Goldberg and Kotval (1999)
Experience using websites	**Total fixation duration**	The difference in the proportions of time spent on search AOIs between the first and last site visit.	Salvucci and Goldberg (2000)
Information seeking activity	**Total fixation duration, visit count**	The proportions of time and visits on search and browse type AOIs.	Salvucci and Goldberg (2000) Tobii Studio

Table 3: Summary of the measures used

Chapter 4: Results

4.1 Sample Profile

Of the 38 participants completing the experiment 17 participants were female while 21 participants were male. All those taking part in the experiment were aged between 18 and 35 years old and were enrolled as students at HEC Montreal from the bachelor to the doctorate level of education. In terms of the divisions between treatments, 18 participants were assigned to the intra-website visitor group and 20 participants assigned to the inter-website visitor group. Participants took on average two hour to complete the experimental protocol.

4.2 Analysis of Alternative-based Information Processing

Due to unforeseen technical difficulties with the software used to extract the eye-tracking data, the various websites visits in the intra-website visitor group, which repeated visits to the same site, could not be disaggregated. The repeat visits to a site generated the same homepage URL containing the target AOIs for a given participant in this group, without a unique visit number identifier. In contrast, extracting data from the inter-website visitor group did not face this problem as each site visit was unique to the participant and so was disaggregated by nature. This being the case, to complete the analysis, a multivariate linear regression with random effects was used to account for the correlation for repeated observations coming from the inter website visitor group. The SAS statistical analysis software (SAS Institute Inc., Cary, USA) suite was used to perform these regressions. Table 4 below represents the results of the four models of regression, whereby two different measures were used to measure the dependent variable, sweeps, and two used to measure the independent variable, search.

The proportion of time spent on search activities is expressed as a percentage of the total information seeking activities, which are the sum of the time spent on browsing and search AOIs, for a given web-page view. The sweep length, which was calculated by taking all sequential saccades moving in the same direction (Aaltonen et al., 1998) horizontally, within a limited height (40 pixels), is expressed in pixels. Results indicate that there is a relationship between the proportions of time spent on directed searching AOIs and the length of the sweep. As can be seen in Table 4 below, the estimate of 109.02 means that for every 1% increase in the proportion of time spent on search AOIs, there is a related increase of 1.09 pixels in the sweep length, and the relationship had a t-value of 3.87. This value indicates that the relationship is highly significant (p-value of 0.0002). When controlling for the two groups, no significant difference was found between inter-website and intra-website visitors (p-value of 0.2996).

The number of visits on search AOIs is calculated as a percentage of the proportions of total visits on search and browse AOIs, for a given page-view. Here, the results indicate a significant relationship between the percentage of visits on search AOIs and the length of the sweep, in pixels (Figure 4). The table below indicates that for every 1% increase in the number of visits on search AOIs, there is an increase in the length of the sweep of 1.81 pixels, and the relationship had a t-value of 5.09. The significance of this result was even higher than that of the proportion of time spent searching (p-value = <0.0001; Table 4). Again, when controlling for the participant groups, no significant difference was found between inter and intra-website visitors.

Figure 4: Heatmap showing concentration of fixations on search AOIs. Resulting sweeps are longer for those with proportionally more search.

When examining the relationship between the proportions of time spent on search AOIs and the average number of sweeps for a site visit, no significant relationship between these two measures was found (p-value = 0.1162; Table 4). For the relationship between the number of visits on search AOIs for a given website visit and the average number of sweeps, no significance was found in the relationship (p-value = 0.788; Table 4). In this case, controlling for both visitor groups did not show any significance in relation to the results.

Measure	Estimate	P-value
Time search → Sweep length	109.02	0.0002*
Visits on search → Sweep length	181.40	<0.0001**
Time search → Number of sweeps	-5.0109	0.1162
Visits on search → Number of sweeps	-1.0961	0.7880

Table 4: Analysis of the relationship between proportions of time as well as number of visits on search AOIs and the length and average number of sweeps. Inter and intra visitor groups are controlled for.

Overall, results indicate that both proportions of time spent on search AOIs as well as the number of visits to these same AOIs have a significant relationship with the resulting sweep length while no significant relationship was found with the average number of sweeps for a given website visit. In light of these findings, H1 was supported by the increase in sweep length representing alternative-based processing. The relationship between time spent as well as number of visits on search AOIs and the number of sweeps was however not significant.

4.3 Analysis of Experience with websites

For the analysis, the proportion of time spent on search AOIs was compared between the first and last of the seven consecutive site visits for both the intra and inter-website visitor groups. For the intra-website visitor group, the first and last website visits were segregated using segments at the beginning and end of participant recordings. For the inter-website visitor group, the preset sequences of site visits in Tobii studio was used to determine which site was the first and last visited for each participant. The analysis was completed using a linear regression.

Results from the analysis reveal that there is an increase in the proportions of time spent on search AOIs on the last visit to a website compared to the first visit for the intra-website visitor group, of 14.3%. This change in proportion of time spent on search AOIs was found to be marginally significant with a one-sided p-value of 0.0554. It is important to note that in comparison, the inter-website visitor group showed almost no difference in proportion of time spent on search AOIs between the first and last site visited, with a very small increase of only 0.518% which is not significant. It is interesting to note that for the inter-website visitor group, the number of visits on search AOIs was 8.2% higher than for the intra-website visitor group as well as the proportions of time spent on search AOIs was 9% higher for the same group.

Measure	**Estimate**	**P-value**
Repeated visits → Time on Search AOIs	0.1433	0.0554

Table 5: Analysis of the change in proportions of time spent on search AOIs between the first and last site visit for the intra-website visitor group.

Table 6 summarizes the findings in the present study, showing the measures that were used in validation of each hypothesis. In addition, the relationship is shown as either significant or not, and indicates whether or not the related hypothesis is supported in light of the said relationship.

H1: In an e-commerce setting, users engaged in proportionally more time on directed search activities will adopt alternative-based processing to a greater degree than users engaged in proportionally less time on directed search activities.		
H1a: Users engaged in proportionally more directed search activities will consider more attributes per alternatives than users engaged in proportionally less directed-search activities,, indicating a greater degree of alternative-based processing.		
Measure	**Correlation**	**Hypothesis**
Proportion of time on search AOIs → Sweep length	Significant	Supported
Number of visits on search AOIs → Sweep length	Significant	Supported
H1b: Users engaged in proportionally more directed search activities will revisit attributes of the same alternative more than users engaged in proportionally less directed-search activities, indicating a greater degree of alternative-based processing.		
Measure	**Correlation**	**Hypothesis**
Proportion of time on search AOIs → Number of sweeps	Not Significant	Not supported
Number of visits on search AOIs → Number of sweeps	Not Significant	Not supported
H2: Repeat visitors to a site will engage in proportionally more time on directed-search activities then new visitors.		
Measure	**Correlation**	**Hypothesis**
Intra-website visitors search time increase	Significant	Marginally supported

Table 6: Summary of hypotheses and correlations of measures

Chapter 5: Conclusion

5.1 Summary of Results

5.1.1 Alternative-based Processing

The results of this study revealed that both the proportions of time spent on directed-search type of information seeking activities and the number of visits in these same directed-search AOIs had a positive relationship with the length of sweeps. When users spent more time looking at directed-search AOIs, the horizontal sweeps on the subsequent results page where users could make a decision on the product to be selected, became longer as well. The number of sweeps on these result pages, however, was not influenced by the time spent on search.

As previously explained, longer saccadic amplitudes demonstrates a greater mental representation of salient components in the task (Goldberg et al., 2002). Taken from this perspective, the longer sweeps resulting from a greater amount of time spent on directed-searching activities indicate attention across a greater number of attributes per alternative. This, in turn, reveals a greater use of alternative-based information processing for users spending proportionally more time searching, thus supporting the first hypothesis presented in this study (H1).

From a behavioral standpoint, it would seem that users searching for specific songs via directed search activities may be verifying a greater portion of the attributes for an alternative so as to ensure the song selected matches the one searched. For example, a user may want to be sure that the song selected is the album version being sought out and so verifies the attributes of the song to confirm it is not a live or acoustic version, which are often presented as part of the results since they carry the same song name as the original search term.

It should be noted that a higher proportion of time spent on search activities did not have a significant relationship with the number of sweeps. One possible explanation for this observation is that music is an experiential good, and so users may be less sensitive to attributes in terms of making comparisons between alternatives. As such, users may not inspect the song attributes in detail as these attributes are not used as a point of comparison that would eliminate certain songs while retaining others, as might be the case for a different product where an attribute such as price is important for comparison. Alternatively, it is possible that the attributes of a song are simpler to process as compared to technical specifications type attributes, for a product such as a car or computer. In this case, these attributes may be easier to remember and hence do not require the consumer to re-examine them as would be evidenced by an increased number of sweeps across these attributes.

Inversely, when a lower proportion of time was spent on directed-search activities and hence more time spent on browsing type of information seeking activities, horizontal sweeps were shorter on the results presented. As such, this may hint at a more attribute-based type of information processing whereby users verify a fewer number of attributes per alternative before going to the next alternative, although this was not specifically investigated in the present study. Nevertheless, the variation in the lengths of sweeps lends credence to the findings by Shi et al. (2013) that users switch between alternative and attribute based processing many times during a website visit. The switch between the information processing types is also in line with users switching between the two states of navigation, browse and directed-search. This was demonstrated by the division in the proportions of time spent on the AOIs representing these information seeking activities, during the course of the experiment.

Relating these findings back to the decision strategies that could be employed by a user when selecting amongst songs presented in a results screen, these can be examined according to the amount of information processed which can be interpreted as the amount of attributes considered (Kim, Dong, Xian, Upatising, & Yi, 2012). As previously stated, certain decision strategies can be categorized as alternative-based processing strategies. In this study, participants may have employed a satisficing type of decision strategy (Simon, 1955), whereby the first alternative to meet the predetermined cutoff (in this case the cutoff being the correct genre, song title or artist that was searched) is the alternative selected from the result set.

Another type of strategy that may have been employed by users in this study is the affect referral strategy (Bettman, 1979). Here, users would elicit from memory a preferred predetermined alternative hence limiting the amount of external information search. Instead they would simply select the alternative matching the one in memory in terms of the song's attributes.

Finally, in line with the observed behavior of user in this experiment employing both browsing and directed search activities, it is possible that some individuals employed combined heuristics or phased strategies whereby one type of strategy is first used to eliminate certain alternatives and then another strategy used to decide amongst the remaining alternatives (Payne, 1976).

5.1.2 Experience with Websites through Repeat Visits

Results from the experiment showed that as users perform repeat visits on a site, they spend a higher proportion of time per page view on elements related to directed search compared to elements related to browsing. These findings indicate an increase in directed search activities as users become familiar with a website and confirm the "spill-over" effect described by Johnson et al. (2003) that is characteristic of the power-law of practice. The authors state that with these "spill-over" learning effects in subsequent visits, less efficient methods of accomplishing the task are abandoned in favor of more efficient methods they are discovered (Johnson, Bellman, Lohse 2003). As pointed out by Janiszewski (1998), directed search is a more efficient method of information retrieval and so it makes sense that this type of information seeking activity is undertaken with greater frequency after repeated visits.

The power-law of practice as applied to electronic commerce also states that the cognitive costs of using a site are reduced with repeat visits. It follows then, that the reduced cognitive costs of using the site and understanding its layout as well as how to search it, may make the directed search function a more appealing avenue (Rowley, 2000). Rather than exploring the site structure through exploratory browsing, users who are familiar with a website may want to arrive at relevant results pages more quickly, and do so via directed-search activities. In addition, repeated visits to the website may also allow the user to formulate clearer preferences and goals which favors directed search as opposed to browsing type of information seeking activities.

5.2 Theoretical Contributions

Most importantly, the present study demonstrated the relationship in an online context between the directed search information seeking activity and the use of alternative-based processing in making a selection amongst a set of alternatives. This relationship had previously only been hinted at in an offline context, with the supposition that individuals with predetermined preferences had a tendency towards alternative-based processing (Chernev, 2003b). In this study, the relationship was drawn empirically by quantifying the proportions of time spent on directed-search activity and measuring the relationship with the resulting visual sweeps across the attributes of a given alternative.

In terms of examining the effects of repeat visits to a website on information seeking activities, Moe and Fader (2004) state that an important area for potential investigation is the activity that takes place within a site visit. Past studies investigating the effects of repeated website visits did so using clickstream navigation data (Bucklin & Sismeiro, 2003; Johnson et al., 2003; Montgomery et al., 2004), which revealed behavior on a website or user session level. In contrast, this study showed how users gain efficiency with experience using a website by examining the change in information seeking behavior on a page-view level, in response to repeat visits. This was accomplished by measuring eye-tracking data on directed search and browsing elements of a website page, which gives a much more specific account of user activity than is available through examination of clickstream data.

5.3 Practical Implications

For website designers, the findings that increased search activities leads to longer visual sweeps across the attributes of an alternative, have important implications. The ability to predict the type of information processing used when viewing results based on eye-movements of users on preceding pages where information is sought, opens the way for website customization. Website pages could be customized to best present the information in function of how the user has navigated the site, rendering the experience easier, more enjoyable and efficient. In this regard, a match between the shopping task and the information format has been shown to allow users to search the information space more efficiently (Hong, Thong, & Tam, 2004). Website designers should prepare several different presentations of result page information, in order to display the one that best fits the user's information seeking behavior, as discussed below.

Websites could be customized in a variety of ways based on information seeking behavior on previous pages. For users that display greater visual attention to the browsing elements of webpages, shorter visual sweeps can be expected. Thus, websites should facilitate this type of information processing behavior. As such, the information displayed on results listings could limit the number of product attributes per alternative presented on results pages, seeing as these primarily browsing users have shorter sweeps and hence inspect less attributes per alternative before proceeding to the next alternative. Moreover, the most important attributes could be presented in the leftmost position seeing as users have a tendency to proceed from left to right when processing information (Shi et al., 2013). Additionally, and perhaps more importantly, a sorting functionality on attributes should be proposed in order to facilitate attribute-based information processing, and potentially pre-sort the results listing on certain attributes, based on browsing history. These types of customizations could help a consumer who is weighing alternatives by attribute (attribute-based processing) to arrive at a decision more quickly and accurately based on an improved presentation format.

Along the same lines, for these primarily browsing users, the size of the primary attributes (the first product attributes on the row representing an alternative) could be increased to attract greater attention and allow for easier comparison between options. For users who give greater visual attention to the search-related elements of a webpage, the attributes along the rows of alternatives could be placed more closely together, without overcrowding the elements, so that a greater number of attributes could be read across a visual sweep when comparing options by alternative (alternative-based processing).

As previously described, repeat website visits led to an increase in directed search activities in this study. This indicates that as users formulate preferences and gain knowledge of how to navigate a site they resort to more focused and efficient information seeking behaviors of directed-search. In this respect, website designers might consider adding a lower level search tool within product category pages, allowing the user to search only the category of interest. In this way the site would aid users who have formulated their goals and preferences and would like to carry out more focused search activities. Although this category level search capability does exist on some e-commerce websites, such as Amazon.com, it has not become common practice, yet could highly benefit seasoned website users. Furthermore, the home page of a website could be dynamically customized for repeat visitors, who are identified with cookies, by presenting a greater amount of directed-search areas above the fold of a webpage. These types of dynamic customizations and tailoring to users' navigation patterns could increase user retention by catering to their information search needs.

5.4 Limitations of the Study & Future Research

Insofar as the limitations of the present study, it is important to note that in terms of information processing, the alternative-based processing was empirically measured using horizontal sweeps. In order to definitively measure attribute-based processing it would be necessary to measure vertical sweeps across a result set, which was not possible in this study due to the use of dynamic AOIs. These AOIs had to be resized to match the scrolling behavior of participants, meaning a variable length, making the calculation of the change in Y coordinates used to measure the sweep unreliable. Future research on information processing should aim to measure attribute-based processing while attempting to relate it to the proportions of time spent on browsing activities to determine if a relationship exists. This would add another level of richness in predicting how users process information, based on eye-movements on preceding web pages leading to a result set. It bears mentioning that the commercial analysis software used in the experiment had unforeseen limitation for long experiments causing some errors in screen captures, hence the use of dynamic AOIs directly on participant recordings. In the future, alternate software solutions may be considered for such rich data capture.

In this study, music was the product of choice to measure information seeking activities and information processing on results pages. Music sites offer a plethora of search and browsing tools that are well organized to aid users in their information search. In terms of information processing, the most important attribute, being how the song sounds, is an experiential one. Furthermore, music tracks across the various websites in the experiment have a fairly stable and low price, meaning users are not price sensitive when making comparisons between options. Future studies could select a product with a higher attribute sensitivity to observe if the change in product type impacts the form of information processing employed by users when making a decision. It would be interesting to examine whether or not the length and number of sweeps would increase with a product having greater attribute sensitivity.

Another limitation of the study revolves around the exclusive use of the horizontal information format presented in the result pages. Seeing as the information format has a known effect on the type of information processing used (Bettman, 1979) it would be interesting to use different information presentation formats to measure the effect on the relationship with information seeking activities. In this respect, future studies could use the vertical information format (columns of alternatives with the attributes in the rows below) or the matrix format (grid of product information). These formats could be used in the measurement of sweeps and by extension the type information processing employed in relation to the preceding information seeking activities.

Finally, it should be noted that the device used for participants' interaction with the various music websites was the desktop computer. Advances in technology over the last decade have seen an explosion of mobile devices used to access and search on the Internet. Subsequent studies could make use of a variety of different mobile devices from smart phones to tablets so as to investigate whether or not the type of devices used to interact with websites have an effect on the breadth and depth of information search and processing activities.

5.5 Concluding Remarks

Recall that the objectives of this study were two-fold. The first objective was to assess the relationship between online information seeking activities and the type of information processing employed by a consumer when deciding amongst alternatives in an online pre-purchase context. The second objective was to examine the effects of repeat visits to a website on the proportions of time spent on directed-search information seeking activities. Both of these objectives were met in the study and eye-tracking proved to be an invaluable tool in doing so.

In studying information search and information processing, eye-tracking has proven to be an excellent process-tracing method as it is an unobtrusive technology that does not distract users from the task at hand as data on eye movements can be collected without the user being aware of it. Furthermore, eye-tracking offers a rich data set, in terms of user behavior in an online context, by being able to pinpoint the exact location of fixations on the display as well as the saccades between these fixations. In addition, eye-tracking can offer temporal information in the duration of fixations and dwell times within region of interest as well as sequential information regarding the order of these fixations.

The most interesting findings of the present study are that it is possible to predict how product information will be processed by consumers based on the type of information they focused on in preceding website pages during a website visit. This being either by alternative or by attribute, can be derived based on eye movements involved in information search on webpages leading up to a product pages where a decision can be made.

It has been suggested that one application strategy for neuroscience tools, such as eye-tracking, is that they be included as built-in functions of IT devices (Vom Brocke, Riedl, & Léger, 2013). In this regard, economies of scale and advances in technology have rendered eye-tracking more accessible on a variety of devices, including mobile. The ubiquity of forward-facing cameras on smartphones as well as webcams on laptop and tablet devices, mean that eye-tracking is no longer confined to the laboratory setting using expensive equipment but rather is accessible to the masses. The release of the Samsung Galaxy IV smartphone has already made the addition of eye-tracking technology to mobile devices a reality, with eye motion-sensitive controls to scroll down webpages during navigation.

In the near future, information collected via eye-tracking on these devices could be used to dynamically customize a website based on how the user is looking at the information displayed. This concept of customization has already been introduced using clickstream data in a concept known as “website morphing” (Hauser, Urban, Liberali, & Braun, 2009), whereby the look and feel of a website is “morphed” to match a user’s navigational patterns. The addition of eye-tracking data to this type of customization can potentially offer unparalleled tailoring of websites for users, based on conscious click-through for site navigation and unconscious eye movements recorded during webpage views. This would allow a website to offer content that is relevant in a format that is useful to the consumer. Overall, the continued evolution of this technology paints a bright future for eye-tracking as it moves beyond its use as a diagnostic tool and into the hands of the population as a tool for dynamic tailoring of websites to match users’ information needs and purchase goals.

Appendix I: Consent form

FORMULAIRE DE CONSENTEMENT À UNE EXPÉRIMENTATION AU TECH³LAB

1. PRESENTATION DU PROJET DE RECHERCHE

Nous vous invitons à participer au projet de recherche portant sur l'expérience des utilisateurs en contexte d'achat en ligne.

Ce projet est réalisé sous la supervision du professeur Sylvain Sénécal que vous pouvez rejoindre par téléphone au 514 340-6980 ou par courriel à sylvain.senecal@hec.ca

2. DESCRIPTION DE L'EXPÉRIMENTATION

Lors de cette expérience, il vous sera demandé d'accomplir des achats en ligne. Un budget vous sera octroyé pour effectuer des achats de musique au cours de la prochaine heure. S'il-vous-plaît, procéder à ces achats de la même manière que vous le feriez en d'autres circonstances.

3. DESCRIPTION DES OUTILS DE MESURE UTILISÉS DANS CETTE RECHERCHE

Durant l'expérience, vous devrez répondre à un questionnaire. S'il-vous-plaît, répondez à ces questions sans hésitation parce que, généralement, votre première impression reflète souvent le mieux votre véritable opinion. Il n'y a pas de limite de temps pour compléter ce questionnaire.

A) Collecte des données de conductance de la peau (activité électrodermale) et de respiration

Nous allons collecter des données physiologiques lorsque vous participerez à cette expérience. Pour mesurer vos signaux physiologiques, nous allons placer des petits senseurs adhésifs et jetables sur certaines parties de votre corps. Un ordinateur enregistrera les données transmises par ces senseurs. Il est donc possible que le chercheur vous touche aux endroits où doivent être placés ces senseurs. Aucun des senseurs utilisés ne contient du latex. En cas d'allergies ou de sensibilités cutanées aiguës, vous ne pourrez pas participer à cette expérimentation. Les senseurs placés sur votre main permettront de déterminer les niveaux de conductibilité électrique de la peau. Ceux-ci seront placés sur deux doigts de la main (ou sur la paume). Les senseurs jetables placés sur votre torse détectent le courant du muscle cardiaque lorsqu'il se contracte, alors que la mince bande élastique placée autour du torse, en haut de la poitrine, mesure l'étirement de la cage thoracique lors de la respiration. Veuillez indiquer au chercheur si vous êtes inconfortable avec le placement des senseurs dont certains pourront être disposés à différents endroits selon votre préférence. Il vous sera aussi offert d'installer vous-mêmes les senseurs dans un endroit que vous jugez privé. Les senseurs sont jetables après utilisation, ne provoquent aucune douleur, ne nécessitent aucune piqûre et ne blessent la peau en aucune manière. Lorsque qu'ils sont retirés après l'expérimentation, cela ne causera pas plus d'inconfort que de retirer un pansement adhésif. **Vous avez le droit de refuser qu'ils soient placés sur votre corps. Dans ce cas, vous ne pourrez pas participer à l'expérimentation**.

B) Collecte du signal électrique de votre cerveau

De plus, nous allons collecter le signal induit par les ondes électriques de votre cerveau. Pour ce faire, nous allons placer un filet de capteurs sur votre tête. Le filet utilisé aura été complètement désinfecté avant son utilisation. Le filet est imbibé d'une solution d'électrolyte (eau salée) avant d'être installé sur votre tête. Cette solution ne comporte aucun risque pour votre cuir chevelu. Au moment de l'installation du casque, une légère quantité d'eau pourrait couler du filet; des serviettes seront posées sur vos épaules et genoux pour éviter des désagréments. Il est nécessaire que le chercheur vous touche à la tête au moment où doit être placé le filet car il vous sera impossible de l'installer vous-même. Veuillez indiquer au chercheur si vous êtes inconfortable avec la mise en place du filet. **Vous avez le droit de refuser que le filet soit placé sur votre tête. Dans ce cas, vous ne pourrez pas participer à l'expérimentation.** Ces capteurs ne provoquent aucune douleur, ne nécessitent aucune piqûre et ne blessent la peau en aucune manière. Lorsque le filet sera retiré après l'expérimentation, cela ne causera pas plus d'inconfort que de retirer un casque de bain. À la fin de l'expérience, vos cheveux seront légèrement mouillés et dépeignés. Une serviette vous sera fournie pour vous essuyer les cheveux.

C) Collecte des données du mouvement des yeux (oculométrie)

Aussi, nous allons collecter des données oculométriques lorsque que vous participerez à cette expérience. L'oculomètre utilise une caméra à lumière infrarouge pour calculer la direction de votre regard à l'écran. Au début de l'expérience, une courte calibration est requise; on vous demandera de fixer des points précis sur l'écran de l'ordinateur. L'utilisation de l'oculomètre est complètement non intrusive. La lumière infrarouge utilisée ne comporte aucun risque. **Vous avez le droit de refuser que l'oculomètre soit utilisé. Dans ce cas, vous ne pourrez pas participer à l'expérimentation.**

D) Collecte des données vidéos de l'expérimentation

Cette expérimentation sera filmée. Si vous acceptez d'être filmé, toutes les vidéos seront confidentielles, protégées par un mot de passe et conservées dans un endroit sécurisé. Les vidéos seront utilisées pour analyser vos actions et vos conversations durant l'expérience. Ces vidéos ne seront jamais publiées ou rediffusées publiquement d'une quelconque façon. Seuls les chercheurs impliqués dans ce projet y auront accès. **Vous avez le droit de refuser que l'expérimentation soit filmée. Dans ce cas, vous ne pourrez pas participer à l'expérimentation.**

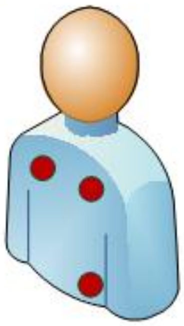
Les équipements utilisés par le Tech³Lab pour mesurer les signaux physiologiques ont tous été homologués au Canada et répond aux normes de sécurité de Santé Canada ou du Conseil canadien des normes (organisme relevant du Parlement du Canada) pour une utilisation dans un contexte de recherche. Le CÉR (Comité d'éthique de la recherche) de HEC Montréal autorise l'utilisation de ces instruments et logiciels. Le personnel du Tech³Lab ne détient aucune formation pour **l'interprétation médicale** des données physiologiques, neurophysiologiques et oculométriques; par conséquent, aucune interprétation individuelle de vos données ou diagnostic de santé, ne sera fourni à la fin de l'expérience.

Votre participation à ce projet de recherche doit être totalement volontaire. Vous pouvez refuser de répondre à l'une ou à l'autre des questions. Il est aussi entendu que vous pouvez demander de mettre un terme à la rencontre, ce qui interdira au chercheur d'utiliser l'information recueillie. Pour toute question en matière d'éthique, vous pouvez communiquer avec le secrétariat du Comité d'éthique de la recherche (CÉR) de HEC Montréal par téléphone au 514 340-7182 ou par courriel à cer@hec.ca. N'hésitez pas à poser au chercheur toutes les questions que vous jugerez pertinentes.

4. POSITIONNEMENT DES SENSEURS

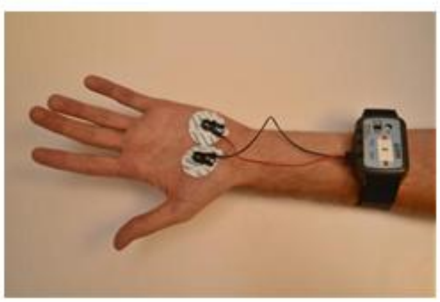
Les sections suivantes illustrent le positionnement des divers capteurs utilisés dans cette expérimentation

ÉLECTROCARDIOGRAPHIE (EKG)



RESPIRATION

RÉPONSE ÉLECTRODERMALE



ÉLECTROENCÉPHALOGRAPHIE (EEG)

OCULOMÉTRIE

5. CONFIDENTIALITE DES DONNÉES RECUEILLIES

Le chercheur, de même que tous les autres membres de l'équipe de recherche, s'engage, le cas échéant, à protéger les renseignements personnels obtenus de la manière suivante :

A. En assurant la protection et la sécurité des données recueillies auprès des participants ou participantes et à conserver les enregistrements dans un lieu sécuritaire;

B. En ne discutant des renseignements confidentiels obtenus auprès des participants ou participantes qu'avec les membres de l'équipe;
C. En n'utilisant pas les données recueillies dans le cadre de ce projet à d'autres fins que celles prévues, à moins qu'elles ne soient approuvées par le CER de HEC Montréal. **Notez que votre approbation à participer à ce projet de recherche équivaut à votre approbation pour l'utilisation de ces données pour des projets futurs qui pourraient être approuvés par le CER de HEC Montréal;**
D. En n'utilisant pas, de quelque manière que ce soit, les données ou les renseignements qu'un participant ou une participante aura explicitement demandé d'exclure de l'ensemble des données recueillies.

Toutes les personnes pouvant avoir accès aux données ont signé un engagement de confidentialité.

Le CER de HEC Montréal a statué que la collecte des données liée à la présente étude satisfait aux normes éthiques en recherche auprès des êtres humains.

6. DÉROULEMENT DE L'EXPÉRIENCE

Cette section précise le déroulement de l'expérience.

- Avant le début de l'expérience, une explication du but de la recherche et du déroulement de l'expérience sera donnée au participant;
- Le participant devra ensuite signer l'accord de consentement qui présente les diverses conditions de l'expérience;
- Selon le cas, les outils de mesures physiologiques et neurophysiologiques seront installés aux endroits appropriés sur le participant et ce, avec son accord;
- Les outils de mesure seront ensuite calibrés (2 à 10 minutes selon les outils utilisés);
- Par la suite, le participant se verra attribuer une période de calme avant de lancer l'expérience afin d'obtenir des données physiologiques de référence pour la suite de l'expérience.
- Par la suite, vous serez amené à utiliser différents outils informatiques pour réaliser des tâches.
- Selon le cas, nous vous demanderons de répondre à un questionnaire pour commenter votre perception de l'utilisation de ces équipements.

7. APRÈS L'EXPÉRIMENTATION :

- Les capteurs seront enlevés. Pour ce faire, il est possible que le chercheur touche les participants aux endroits où se trouvent les capteurs.
- Les capteurs seront retirés délicatement; les participants seront informés que cela ne cause pas plus de malaise que de retirer un pansement adhésif ou le retrait d'un casque de bain selon l'outil de mesure.
- Selon le contexte de recherche, les participants seront invités à remplir un questionnaire post-expérimental.
- Un *debriefing* sera également offert aux participants en fonction du contexte de la recherche. Toutefois, aucune interprétation clinique des données brutes ne pourront être fournies aux participants.

8. AGE DU PARTICIPANT

Êtes-vous âgé de 18 ans ou plus?

OUI ☐ **NON** ☐

Si vous avez répondu NON, vous ne pouvez **PAS** participer à cette expérimentation.

9. AUTRES CONDITIONS DE PARTICIPATION

Avez-vous des allergies cutanées ou des sensibilités particulières?

OUI ☐ **NON** ☐

Avez-vous un stimulateur cardiaque ?

OUI ☐ **NON** ☐

Avez-vous une correction de vue au laser ou de l'astigmatisme ?

OUI ☐ **NON** ☐

Avez-vous besoin de lunettes pour travailler à l'ordinateur ?

OUI ☐ **NON** ☐

Souffrez-vous ou avez-vous souffert d'épilepsie?

OUI ☐ **NON** ☐

Si vous avez répondu OUI à une de ces questions, vous ne pouvez **PAS** participer à cette expérimentation.

CONSENTEMENT A L'EXPÈRIMENTATION

Le chercheur, qui mène cette étude, m'a expliqué ce que je devrai faire durant l'étude et j'accepte d'y participer. Ni mon nom ou toute autre information permettant de m'identifier ne seront divulgués. Je comprends que toutes les informations que je fournirai seront gardées strictement confidentielles. De plus, je comprends que ma participation à cette étude est volontaire et que je suis libre de retirer mon consentement et de mettre fin à ma participation à tout moment.

- ☐ **J'accepte de participer à cette expérimentation**
- ☐ **Je refuse de participer à cette expérimentation**

CONSENTEMENT A L'ENREGISTREMENT AUDIO-VISUEL

Cette expérimentation sera filmée. Si vous acceptez d'être filmé, toutes les vidéos seront confidentielles, protégées par un mot de passe et conservées sous clef. Les vidéos seront utilisées pour analyser vos actions et vos conversations durant l'expérience. Ces vidéos ne seront jamais publiées ou rediffusées publiquement d'une quelconque façon. Seuls les chercheurs impliqués dans le projet y auront accès.

- ☐ **J'accepte que l'expérimentation soit filmée**
- ☐ **Je refuse que l'expérimentation soit filmée**

10. SIGNATURES DU PARTICIPANT ET DU CHERCHEUR :

Prénom et nom du participant : ____________________________________

Signature du participant: ________________________ Date (jj/mm/aaaa): __________

Prénom et nom du chercheur : ____________________________________

Signature du chercheur : ________________________ Date (jj/mm/aaaa): __________

Appendix II: Compensation Form

A Neurophysiosiological Perspective on How Consumers Respond to Well-Known Vs. New Websites : Phase 2

Formulaire J

FORMULAIRE DE COMPENSATION POUR LA PARTICIPATION À LA RECHERCHE

Chaque personne qui participe à cette recherche recevra une compensation de 40$ sous la forme d'une carte cadeau Amazon. Une telle somme vous sera versée en compensation du temps que vous consacrez à cette recherche. Il ne s'agit de pas d'une rémunération. Afin que nous puissions acheminer la compensation, les participants sont tenus de remplir ce document d'identification. Dans le but de maintenir l'anonymat des répondants, les documents d'identification ne pourront être rattachés aux questionnaires remplis une fois ces derniers retournés au chercheur.

Je confirme avoir reçu ma compensation de 40$ sous la forme d'une carte cadeau Amazon.

Nom du répondant	
Courriel	
Les 4 derniers caractères du numéro de chèque-cadeau	
Adresse :	
Ville :	
Code postal :	
N^{o} de téléphone :	
Signature	

Je suis intéressé(e) à participer à des expériences futures du Tech3Lab. J'accepte d'être contacté par courriel. Oui [ ] Non [ ]

Appendix III: Experiment Procedure

Procédure de collecte de données
« Neuroscript: Achat de musique en ligne »

Plusieurs jours avant…

Chère participante, Cher participant,

Le message suivant confirme votre participation à l'étude étude sur l'achat de musique en ligne. Nous vous remercions de votre inscription.

Vous êtes le participant numéro: P03.

En préparation à votre participation, veuillez visiter la page suivante afin d'obtenir plus d'information sur l'étude et nous fournir un numéro de téléphone pour vous joindre 24h avant votre participation:

http://ww3.unipark.de/uc/tech3lab/

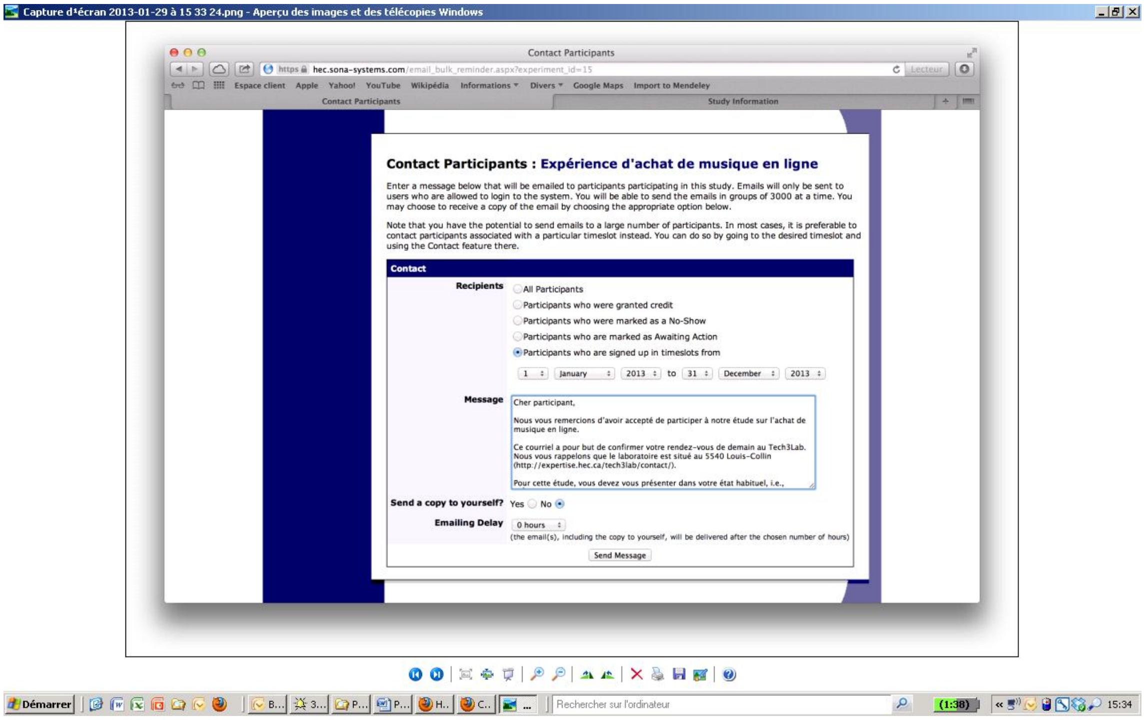
Nous vous remercions de votre participation.

Cordialement,

Prof. Sylvain Sénécal, Ph.D.
Co-directeur
Laboratoire Tech3Lab
sylvain.senecal@hec.ca

Avant (24h)

Effectuer un rappel par courriel aux participants 24h avant leur rendez-vous au T3L et les conditions de participation et toutes consignes supplémentaires via le système SONA du panel HEC :



SVP utiliser le texte ci-dessous dans ce système :

Chère participante, cher participant,

Nous vous remercions d'avoir accepté de participer à notre étude sur l'achat de musique en ligne.

Ce courriel a pour but de confirmer votre rendez-vous de demain au Tech3Lab. Nous vous rappelons que le laboratoire est situé au 5540 Louis-Colin (http://expertise.hec.ca/tech3lab/contact/).

Pour cette étude, vous devez vous présenter dans votre état habituel, ex.:
- Veuillez ne pas prendre plus de café ou autres stimulants qu'habituellement;
- Veuillez vous laver les cheveux et ne pas avoir de produits coiffants (ex. : gel coiffant) dans les cheveux pour cette étude;
- Si vous êtes enrhumé et avez une toux, veuillez nous contacter dès maintenant (tech3lab@hec.ca).

Afin de vous préparer à l'expérience, veuillez écrire sur une feuille les 10 chansons que vous souhaitez acheter lors de l'expérimentation et apporter cette feuille avec vous.

Pour vous remercier de votre participation à notre étude, nous vous rappelons que vous obtiendrez une compensation financière d'une valeur de 30$.

Dans l'attente de vous accueillir demain au laboratoire,

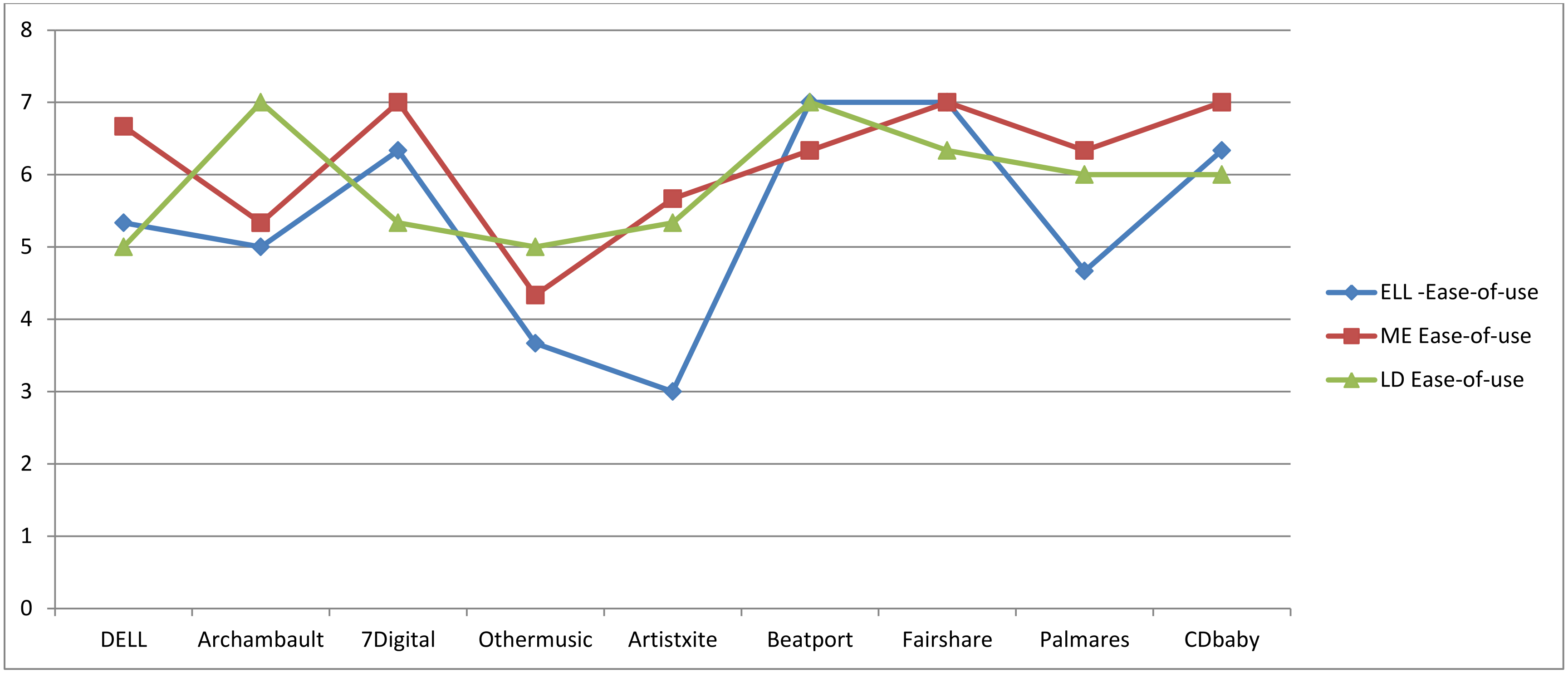
Tech3Lab

Appendix IV: Website Evaluation

	Questions	**DEL L**	**Archambau lt**	**7Digita l**	**Othermusic**	**Artistxite**	**Beatport**	**Fairshar e**	**Palmare s**	**CDbab y**
ELL	Learning to operate the Web site is easy for me.	5	5	6	4	3	7	7	5	6
ELL	It would be easy for me to become skillful at using the Web site.	5	6	7	5	4	7	7	6	7
ELL	I find the Web site easy to use.	6	4	6	2	2	7	7	3	6

	Questions	**DEL L**	**Archambau lt**	**7Digita l**	**Othermusic**	**Artistxite**	**Beatport**	**Fairshar e**	**Palmare s**	**CDbab y**
ME	Learning to operate the Web site is easy for me.	7	5	7	4	6	7	7	6	7
ME	It would be easy for me to become skillful at using the Web site.	7	6	7	5	6	6	7	7	7
ME	I find the Web site easy to use.	6	5	7	4	5	6	7	6	7

	Questions	**DEL L**	**Archambau lt**	**7Digita l**	**Othermusic**	**Artistxite**	**Beatport**	**Fairshar e**	**Palmare s**	**CDbab y**
LD	Learning to operate the Web site is easy for me.	6	7	5	5	5	7	6	6	6
LD	It would be easy for me to become skillful at using the Web site.	6	7	6	6	6	7	7	6	6
LD	I find the Web site easy to use.	3	7	5	4	5	7	6	6	6

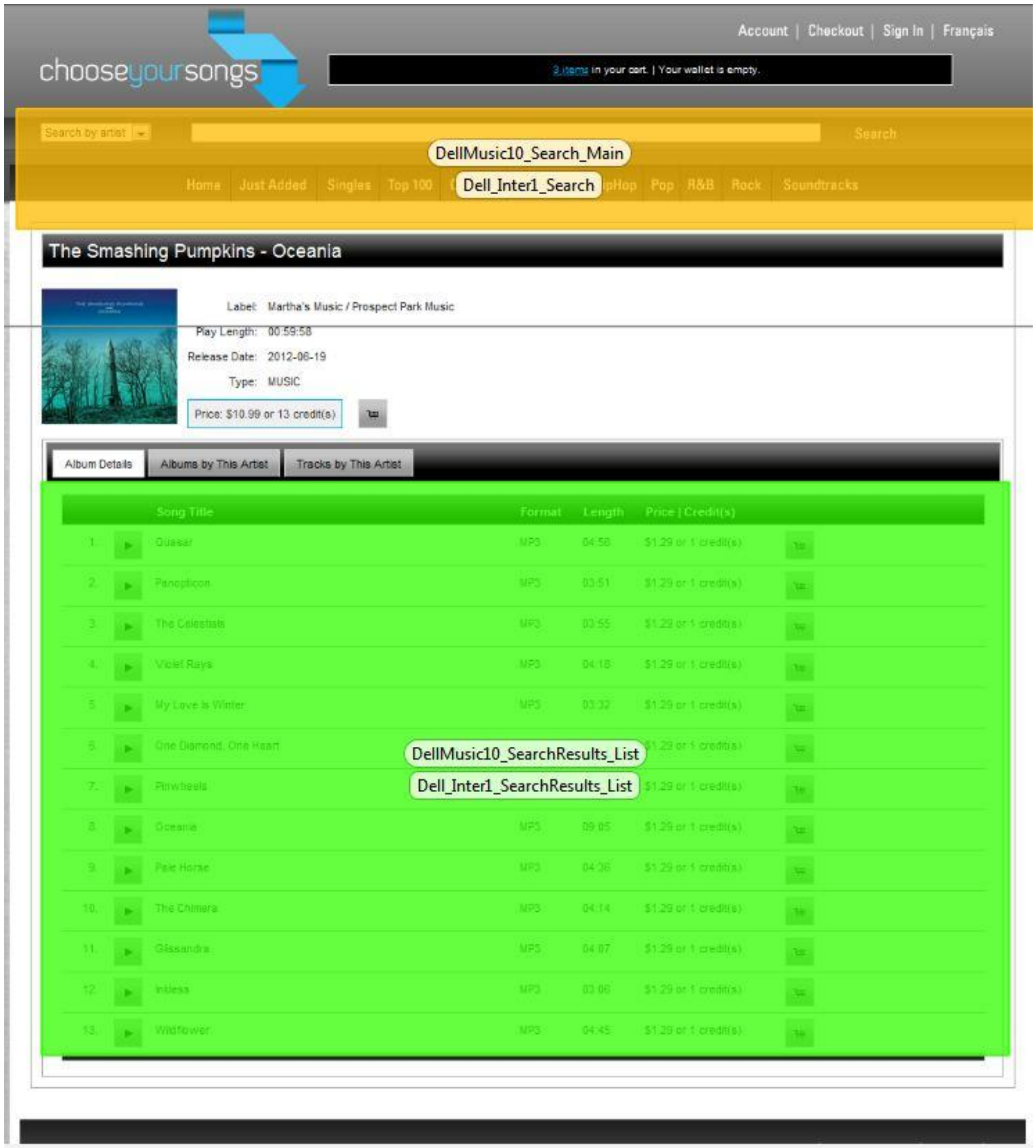

8
7
6
5
4
3
2
1
0
DELL
Archambault
7Digital
Othermusic
Artistxite
Beatport
Fairshare
Palmares
CDbaby
ELL -Ease-of-use
ME Ease-of-use
LD Ease-of-use

Appendix V: Website Visit Sequences

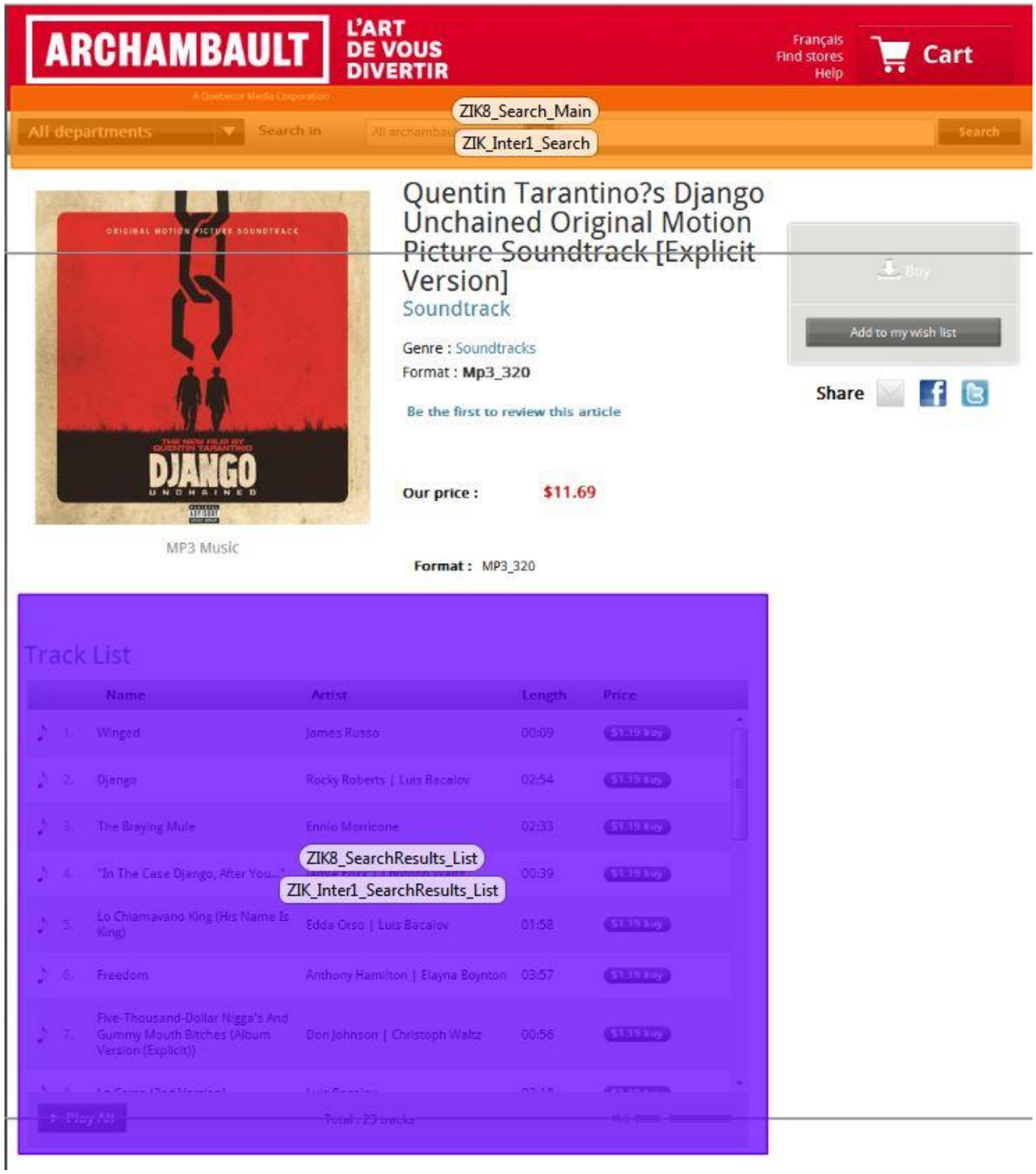
Site	Sequence #1	Sequence #2	Sequence #3	Sequence #4	Sequence #5	Sequence #6	Sequence #7	Sequence #8
1	Beatport	Artistxite	Beatport	Beatport	Artistxite	Beatport	Artistxite	Beatport
2	Othermusic	CDBaby	Othermusic	ZIK	ZIK	Palmares	ZIK	7Digital
3	Fairshare	Palmares	Artistxite	Palmares	Palmares	7Digital	Beatport	Palmares
4	Artistxite	7Digital	Palmares	Artistxite	Beatport	Artistxite	Palmares	Fairshare
5	7Digital	ZIK	Fairshare	7Digital	CDBaby	ZIK	Fairshare	ZIK
6	Palmares	Beatport	7Digital	Fairshare	Fairshare	CDBaby	CDBaby	CDBaby
7	CDBaby	Fairshare	CDBaby	CDBaby	7Digital	Fairshare	7Digital	Artistxite

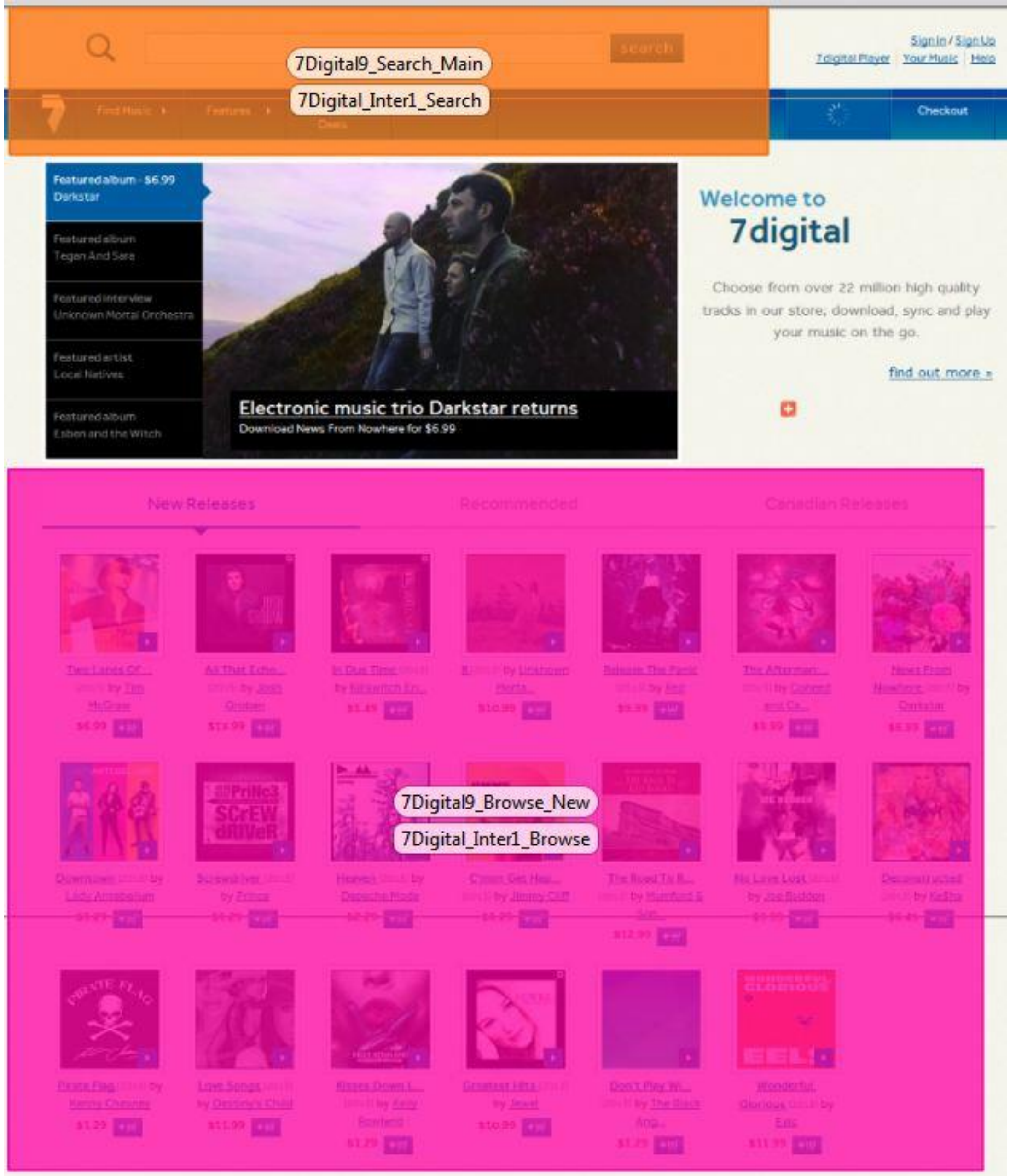
Site	Sequence #9	Sequence #10	Sequence #11	Sequence #12	Sequence #13	Sequence #14	Sequence #15	Sequence #16
1	Artistxite	Artistxite	Beatport	Beatport	Artistxite	Artistxite	Beatport	Artistxite
2	Beatport	Beatport	Palmares	Palmares	Palmares	Palmares	ZIK	CDBaby
3	Fairshare	Othermusic	7Digital	ZIK	ZIK	CDBaby	Artistxite	ZIK
4	Othermusic	Fairshare	ZIK	Artistxite	CDBaby	ZIK	7Digital	7Digital
5	7Digital	Palmares	Fairshare	7Digital	Beatport	7Digital	Fairshare	Palmares
6	Palmares	7Digital	CDBaby	CDBaby	7Digital	Beatport	Palmares	Fairshare
7	CDBaby	CDBaby	Artistxite	Fairshare	Fairshare	Fairshare	CDBaby	Beatport

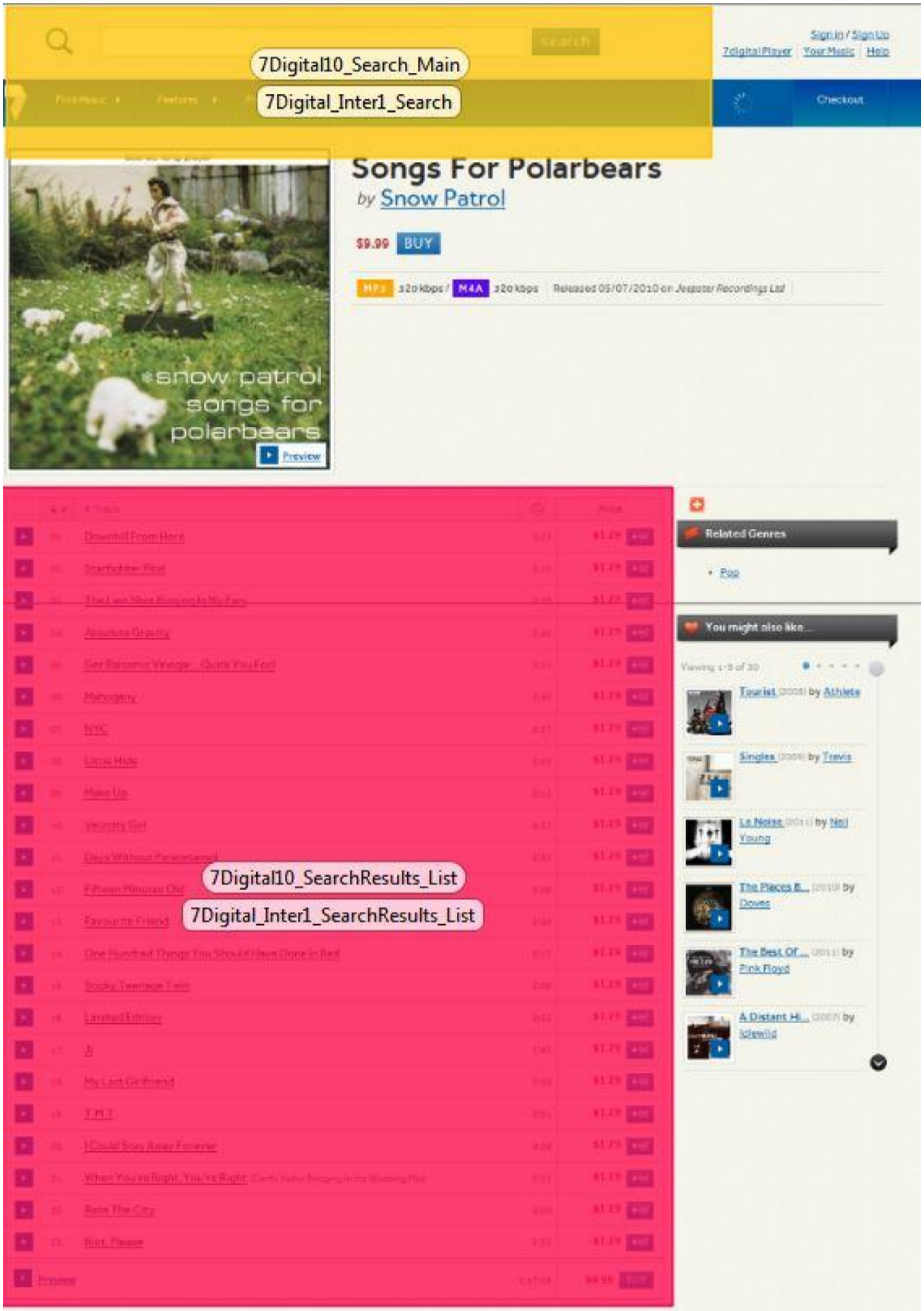
Appendix VI: AOI Coding


Account | Checkout | Sign In | Français
chooseyoursongs
DellMusic10_Search_Main
Dell_Inter1_Search
The Smashing Pumpkins - Oceania
Label: Martha's Music / Prospect Park Music
Play Length: 00:59:58
Release Date: 2012-06-19
Type: MUSIC
Price: $10.99 or 13 credit(s)
Album Details
Albums by This Artist
Tracks by This Artist
DellMusic10_SearchResults_List
Dell_Inter1_SearchResults_List


ARCHAMBAULT
L'ART DE VOUS DIVERTIR
Français
Find stores
Help
Cart
ZIK8_Search_Main
ZIK_Inter1_Search
ZIK
ARCHAMBAULT
MILLIONS OF SONGS AVAILABLE WHEREVER YOU ARE, WHENEVER YOU WANT
HOLLYWOOD UNDEAD
ZIK8_Search_Genre
ZIK_Inter1_Search
New Releases MP3
Promotions
New Releases
MP3 Audiobooks
ZIK8_Browse_New
ZIK_Inter1_Browse
2012
ZIK8_Browse_Top
ZIK_Inter1_Browse
ACCLAIMED BY THE CRITICS
Archambault MP3
E-mail Address :
Subscribe
Suggestions
Institutional Services
MP3 Deals
ZIK8_Browse_Recommend
ZIK_Inter1_Browse

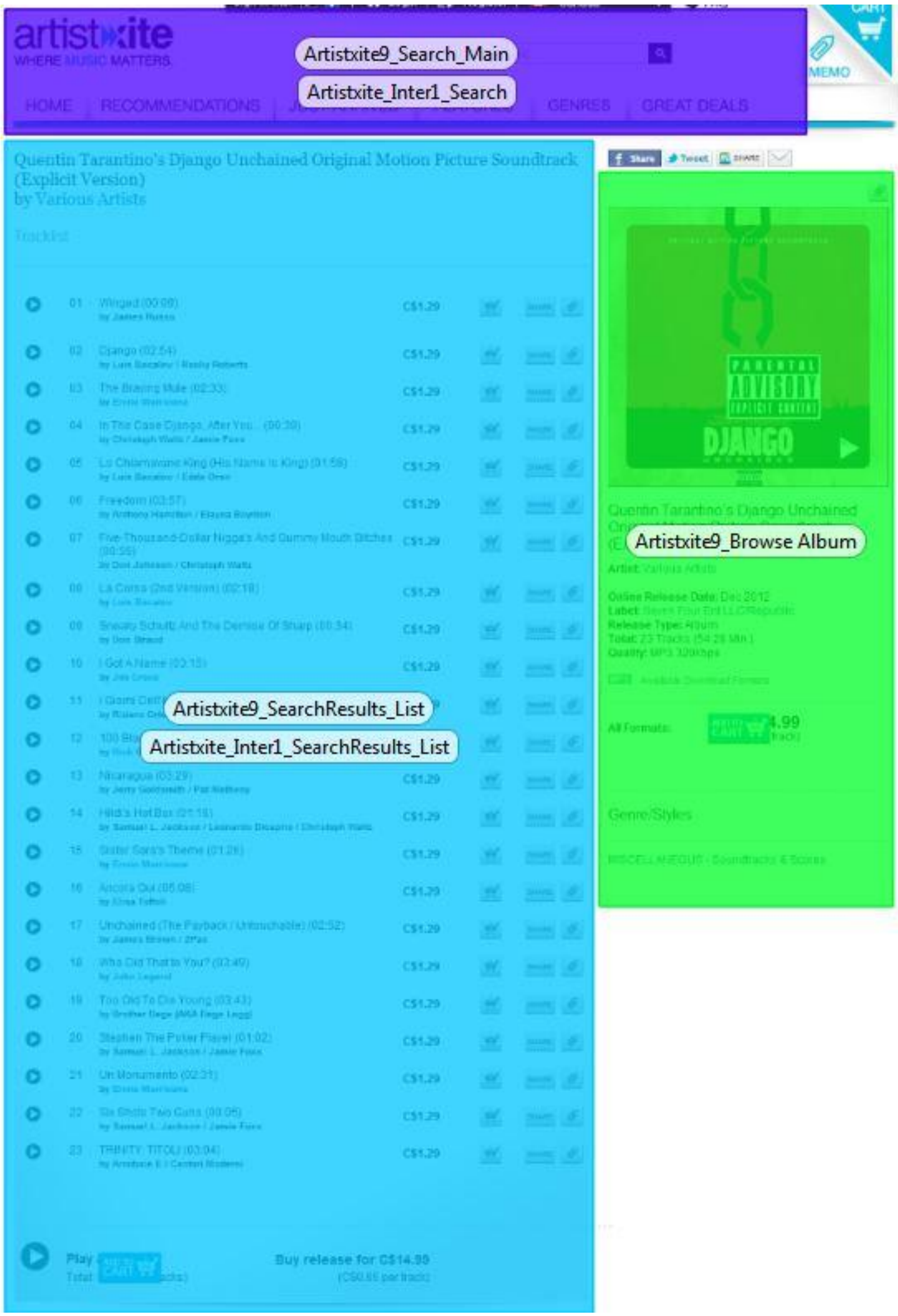

ARCHAMBAULT
L'ART DE VOUS DIVERTIR
Français
Find stores
Help
Cart
All departments
Search in
Search
ZIK8_Search_Main
ZIK_Inter1_Search
Quentin Tarantino?s Django Unchained Original Motion Picture Soundtrack [Explicit Version]
Soundtrack
Genre : Soundtracks
Format : Mp3_320
Be the first to review this article
Buy
Add to my wish list
Share
Our price : $11.69
MP3 Music
Format : MP3_320
Track List
Name
Artist
Length
Price
ZIK8_SearchResults_List
ZIK_Inter1_SearchResults_List

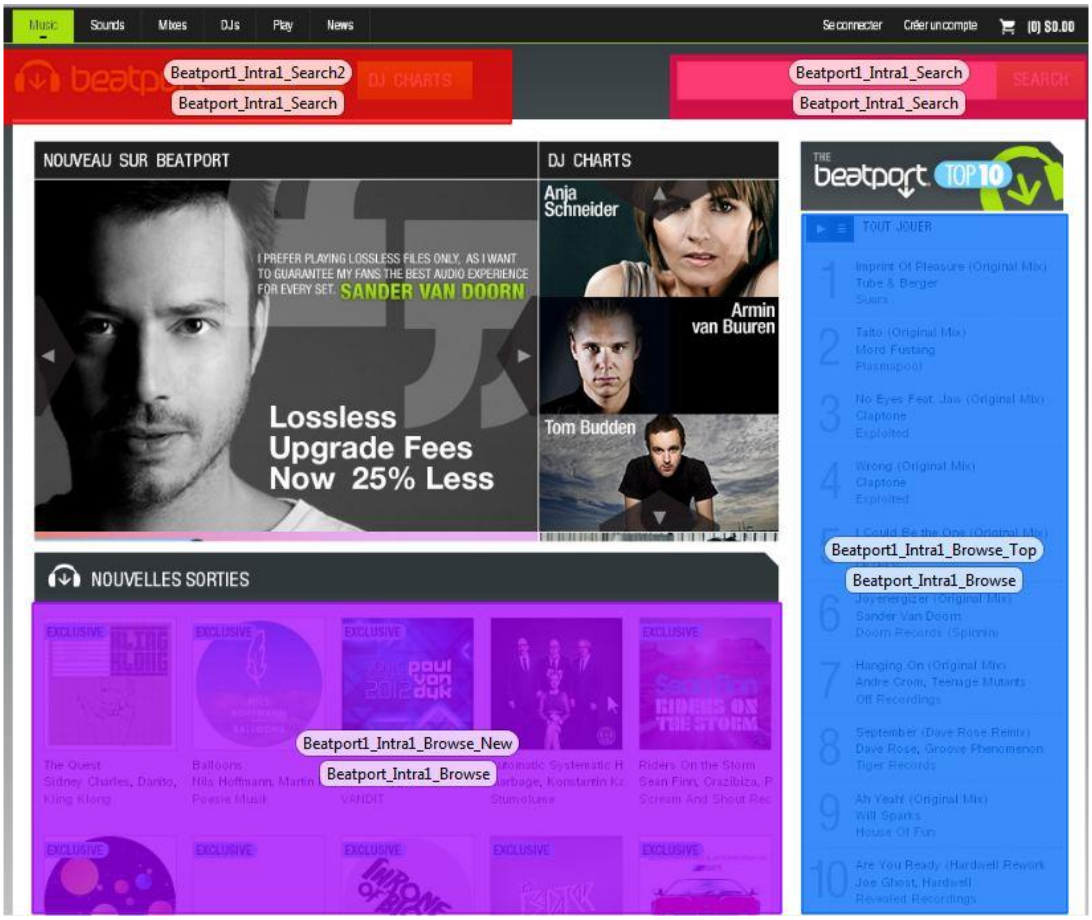

7Digital9_Search_Main
7Digital_Inter1_Search
Sign in / Sign Up
7digital Player
Your Music
Help
Checkout
Featured album - $6.99
Darkstar
Featured album
Tegan And Sara
Featured interview
Unknown Mortal Orchestra
Featured artist
Local Natives
Featured album
Esben and the Witch
Electronic music trio Darkstar returns
Download News From Nowhere for $6.99
Welcome to
7digital
Choose from over 22 million high quality tracks in our store; download, sync and play your music on the go.
find out more »
7Digital9_Browse_New
7Digital_Inter1_Browse

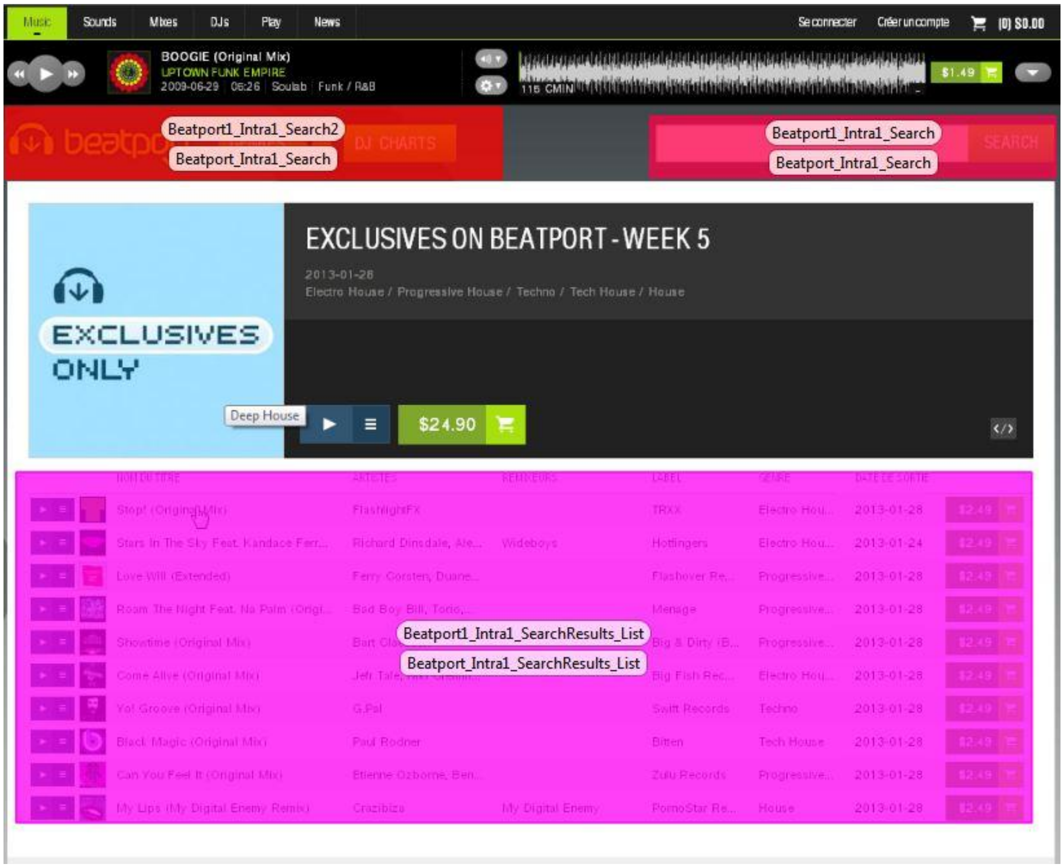


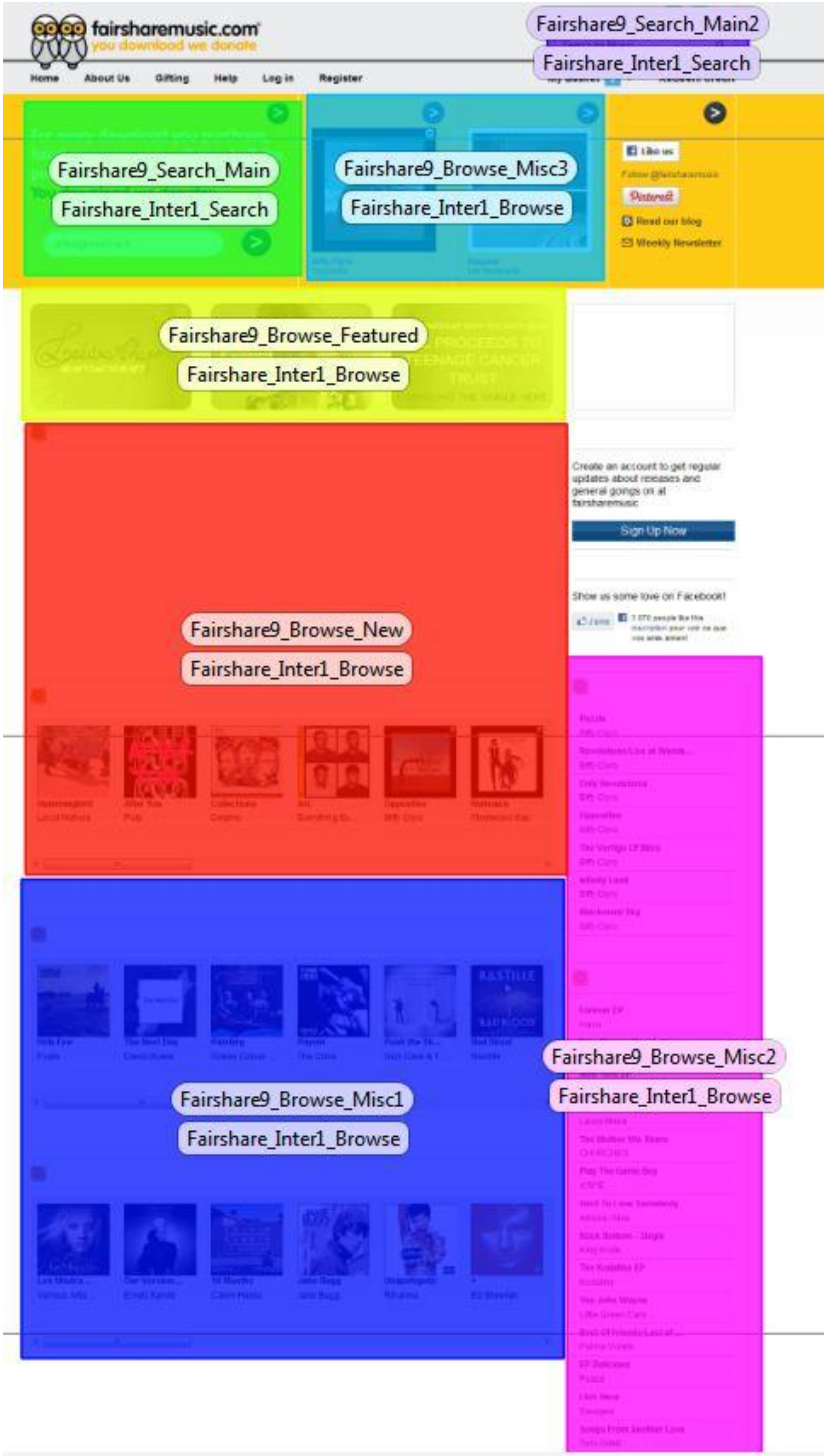
7Digital10_Search_Main
7Digital_Inter1_Search
Sign in / Sign Up
Checkout
Songs For Polarbears
by Snow Patrol
$9.99 BUY
MP3 320kbps / M4A 320kbps
snow patrol
songs for
polarbears
Preview
Related Genres
You might also like...
7Digital10_SearchResults_List
7Digital_Inter1_SearchResults_List

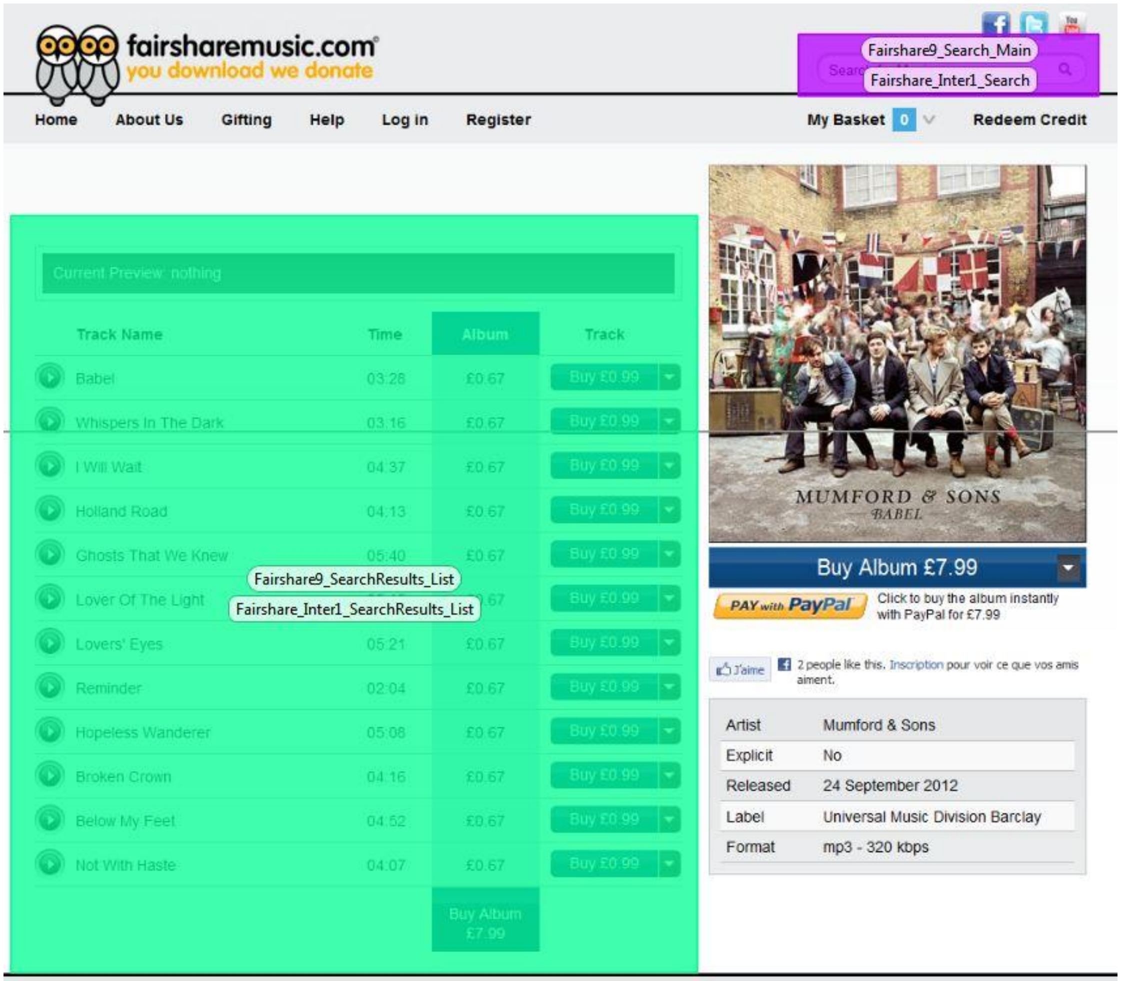

Artistxite9_Browse_featured
Artistxite_Inter1_Browse
Artistxite9_Browse_Recommend
Artistxite_Inter1_Browse
Artistxite9_Browse_Misc
Artistxite_Inter1_Browse
Artistxite9_Browse_New
Artistxite_Inter1_Browse


Artistxite9_Search_Main
Artistxite_Inter1_Search
Artistxite9_Browse Album
Artistxite9_SearchResults_List
Artistxite_Inter1_SearchResults_List
Quentin Tarantino's Django Unchained Original Motion Picture Soundtrack (Explicit Version)
by Various Artists

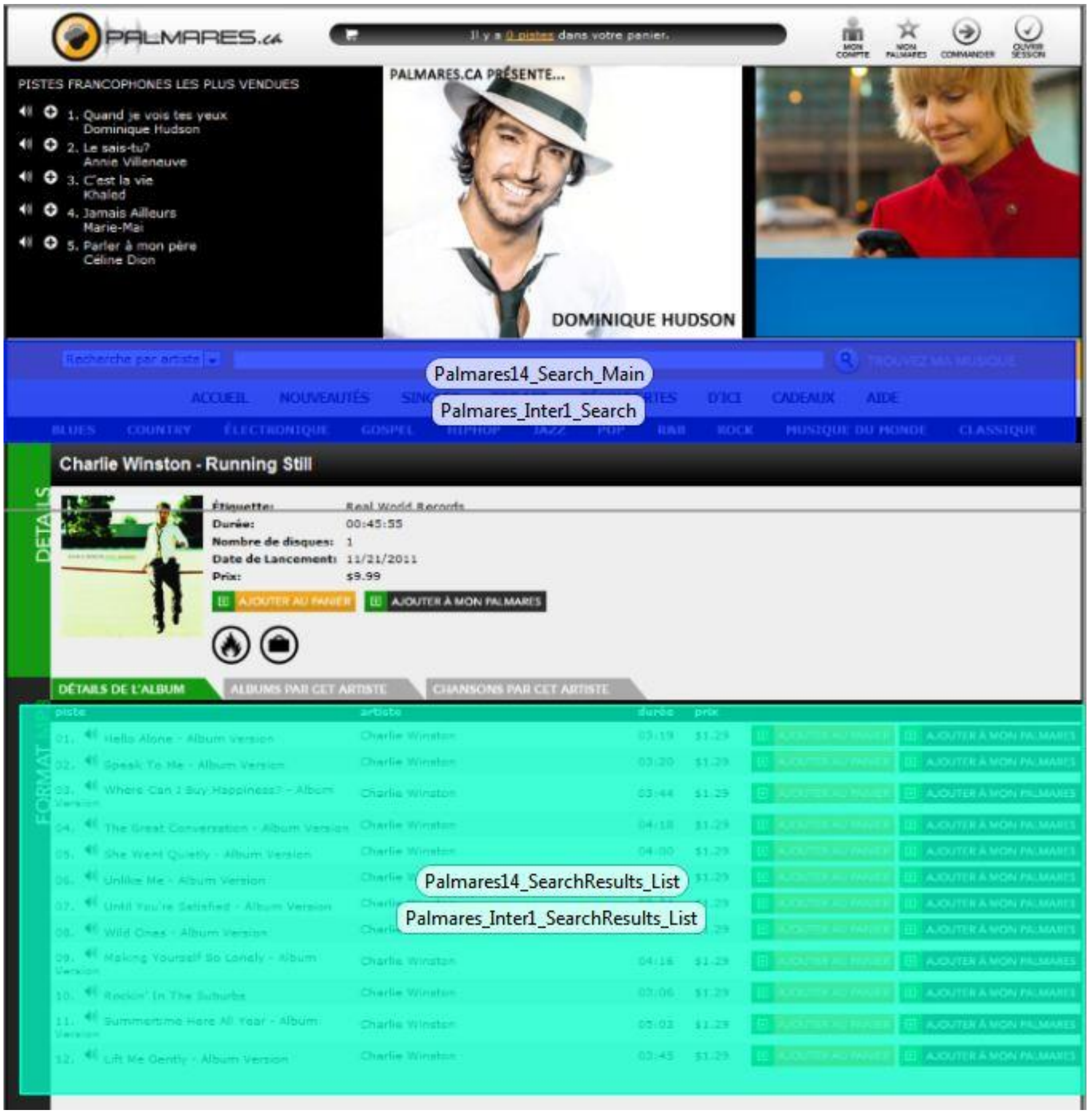

Music
Sounds
Mixes
DJs
Play
News
Se connecter
Créer un compte
(0) $0.00
Beatport1_Intra1_Search2
Beatport_Intra1_Search
Beatport1_Intra1_Search
Beatport_Intra1_Search
NOUVEAU SUR BEATPORT
I PREFER PLAYING LOSSLESS FILES ONLY, AS I WANT TO GUARANTEE MY FANS THE BEST AUDIO EXPERIENCE FOR EVERY SET. SANDER VAN DOORN
Lossless
Upgrade Fees
Now 25% Less
DJ CHARTS
Anja Schneider
Armin van Buuren
Tom Budden
NOUVELLES SORTIES
Beatport1_Intra1_Browse_New
Beatport_Intra1_Browse
Beatport1_Intra1_Browse_Top
Beatport_Intra1_Browse

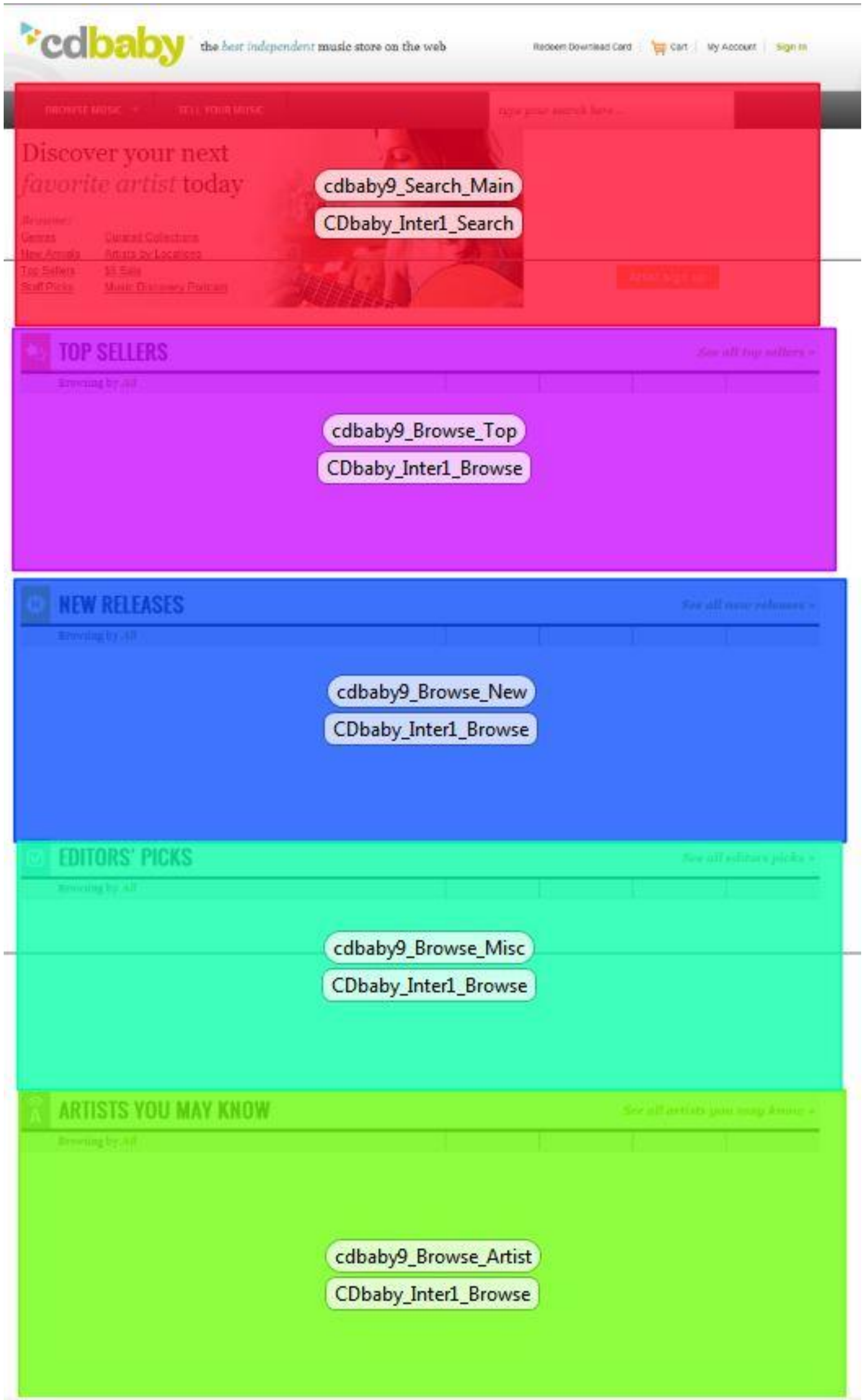

Music
Sounds
Mixes
DJs
Play
News
Se connecter
Créer un compte
(0) $0.00
BOOGIE (Original Mix)
UPTOWN FUNK EMPIRE
2009-06-29 06:26 Soulab Funk / R&B
$1.49
Beatport1_Intra1_Search2
Beatport_Intra1_Search
Beatport1_Intra1_Search
Beatport_Intra1_Search
EXCLUSIVES ON BEATPORT - WEEK 5
2013-01-28
Electro House / Progressive House / Techno / Tech House / House
EXCLUSIVES ONLY
Deep House
$24.90
Beatport1_Intra1_SearchResults_List
Beatport_Intra1_SearchResults_List


fairsharemusic.com
you download we donate
Home
About Us
Gifting
Help
Log in
Register
Fairshare9_Search_Main2
Fairshare_Inter1_Search
Fairshare9_Search_Main
Fairshare_Inter1_Search
Fairshare9_Browse_Misc3
Fairshare_Inter1_Browse
Like us
Pinterest
Read our blog
Weekly Newsletter
Fairshare9_Browse_Featured
Fairshare_Inter1_Browse
Create an account to get regular updates about releases and general goings on at fairsharemusic
Sign Up Now
Show us some love on Facebook!
Fairshare9_Browse_New
Fairshare_Inter1_Browse
Fairshare9_Browse_Misc2
Fairshare_Inter1_Browse
Fairshare9_Browse_Misc1
Fairshare_Inter1_Browse


fairsharemusic.com
you download we donate
Fairshare9_Search_Main
Fairshare_Inter1_Search
Home
About Us
Gifting
Help
Log in
Register
My Basket 0
Redeem Credit
Current Preview: nothing
Track Name
Time
Album
Track
Babel 03:28 £0.67 Buy £0.99
Whispers In The Dark 03:16 £0.67 Buy £0.99
I Will Wait 04:37 £0.67 Buy £0.99
Holland Road 04:13 £0.67 Buy £0.99
Ghosts That We Knew 05:40 £0.67 Buy £0.99
Lover Of The Light
Lovers' Eyes 05:21 £0.67 Buy £0.99
Reminder 02:04 £0.67 Buy £0.99
Hopeless Wanderer 05:08 £0.67 Buy £0.99
Broken Crown 04:16 £0.67 Buy £0.99
Below My Feet 04:52 £0.67 Buy £0.99
Not With Haste 04:07 £0.67 Buy £0.99
Buy Album £7.99
Fairshare9_SearchResults_List
Fairshare_Inter1_SearchResults_List
MUMFORD & SONS
BABEL
Buy Album £7.99
PAY with PayPal
Click to buy the album instantly with PayPal for £7.99
J'aime
2 people like this. Inscription pour voir ce que vos amis aiment.
Artist Mumford & Sons
Explicit No
Released 24 September 2012
Label Universal Music Division Barclay
Format mp3 - 320 kbps


PALMARES.ca
Palmares9_Browse_Recommend
Palmares_Inter1_Browse
Saskia, notre animatrice chouchou,
nous parle d'elle, de sa vie de maman, d'amoureuse, de femme.
Palmares9_Search_Main
Palmares_Inter1_Search
Palmares9_Browse_Featured
Palmares_Inter1_Browse
Palmares9_Browse_New
Palmares_Inter1_Browse
Palmares9_Browse_Top
Palmares_Inter1_Browse


PALMARES.ca
Il y a 0 pistes dans votre panier.
PISTES FRANCOPHONES LES PLUS VENDUES
1. Quand je vois tes yeux
Dominique Hudson
2. Le sais-tu?
Annie Villeneuve
3. C'est la vie
Khaled
4. Jamais Ailleurs
Marie-Mai
5. Parler à mon père
Céline Dion
PALMARES.CA PRÉSENTE...
DOMINIQUE HUDSON
Palmares14_Search_Main
Palmares_Inter1_Search
Charlie Winston - Running Still
DÉTAILS
Durée: 00:45:55
Nombre de disques: 1
Date de Lancement: 11/21/2011
Prix: $9.99
AJOUTER AU PANIER
AJOUTER À MON PALMARES
DÉTAILS DE L'ALBUM
ALBUMS PAR CET ARTISTE
CHANSONS PAR CET ARTISTE
Palmares14_SearchResults_List
Palmares_Inter1_SearchResults_List


cdbaby
the best independent music store on the web
Redeem Download Card
Cart
My Account
Sign In
Discover your next favorite artist today
cdbaby9_Search_Main
CDbaby_Inter1_Search
TOP SELLERS
cdbaby9_Browse_Top
CDbaby_Inter1_Browse
NEW RELEASES
cdbaby9_Browse_New
CDbaby_Inter1_Browse
EDITORS' PICKS
cdbaby9_Browse_Misc
CDbaby_Inter1_Browse
ARTISTS YOU MAY KNOW
cdbaby9_Browse_Artist
CDbaby_Inter1_Browse


cdbaby
the best independent music store on the web
Redeem Download Card
Cart
My Account
Sign In
cdbaby8_Search_Main
CDbaby_Inter1_Search
Home > DJ Pon-3 > My Little Bass Cannon
My Little Bass Cannon
by DJ Pon-3
© Copyright - DJ Pon-3 / DJ Pon-3 (887516156786)
available for download only
Log in to view wishlist
Angry and growly Dubstep, mixed with Drumstep and Complextro mostly included with Rastafarian mood.
Genre: Electronic: Dubstep
Release Date: 2013
Go To Artist Page
MORE ALBUMS BY THIS ARTIST
TRACKS
cdBaby8_SearchResults_List
CDbaby_Inter1_SearchResults_List
Recommended if You Like
Feed Me
Knife Party
Skrillex
More Artists From
Czech Republic
Other Genres You Will Love
Electronic: Dubstep
Reggae: Dub
Moods: Mood: Angry
ABOUT THIS ALBUM
Album Notes
Second time sparking in the music industry in a short time period with a second EP right here. If you're looking for Dubstep from the one and only Vinyl Scratch aka DJ Pon-3, you're on the right note.
I realy hope you all will enjoy it and it's always pleasure to continue in work i love and get such a wonderful support.
Not what you're looking for? Use advanced search.
Read more...


Othermusic1_Search_Main1
Othermusic_Inter1_Search
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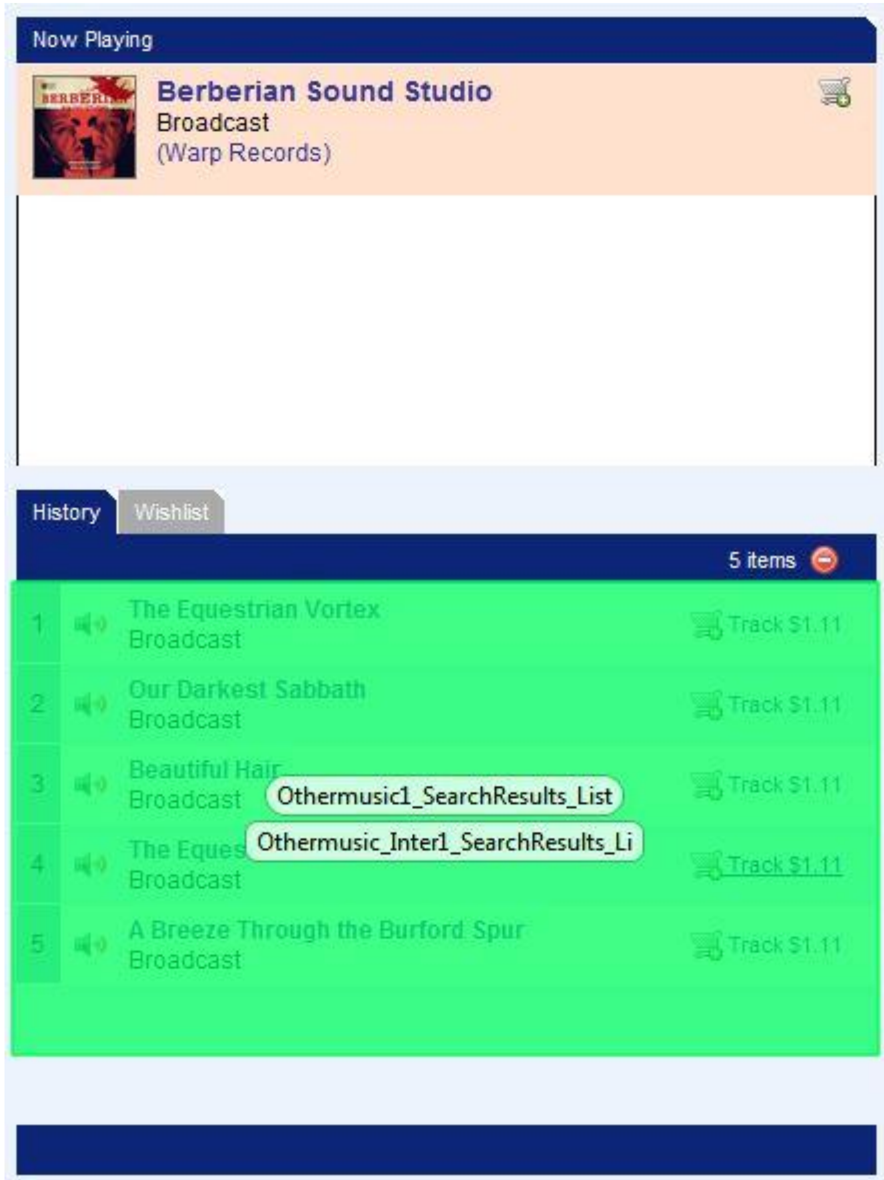
Now Playing
Berberian Sound Studio
Broadcast
(Warp Records)
History
Wishlist
5 items
1 The Equestrian Vortex
Broadcast
Track $1.11
2 Our Darkest Sabbath
Broadcast
Track $1.11
3 Beautiful Hair
Broadcast
Track $1.11
Othermusic1_SearchResults_List
4 The Eques
Broadcast
Track $1.11
Othermusic_Inter1_SearchResults_Li
5 A Breeze Through the Burford Spur
Broadcast
Track $1.11

Appendix VII: Eye-tracking Measures Tables

Sweep length and number of sweeps for the inter-website visitor group

Participant	WebSite	% Search	% browsing	Fixation Duration Browse	Fixation Duration Search	Visit Count Browse	Visit Count Search	Sweep length	total # of sweeps
P07	Artistxite	0.104567468	0.895432532	334.65	39.08	23	27	156.1428571	21
P07	7 Digital	0.451844597	0.548155403	16.79	13.84	5	15	255	9
P07	Cdbaby	0.027872246	0.972127754	262.98	7.54	9	7	245.6666667	3
P07	Fairshare	0.067065073	0.932934927	42.15	3.03	10	4	280.525	43
P07	Palmares	0.017906172	0.982093828	164.54	3	21	5	286.1333333	44
P01	Artistxite	0.431610942	0.568389058	59.84	45.44	10	8	114	6
P01	Othermusic	0.296614797	0.703385203	51.53	21.73	12	12	246	5
P01	Fairshare	0.081981693	0.918018307	114.33	10.21	12	10	212.3	10
P11	Beatport	0.039238768	0.960761232	48.97	2	8	4	174.3333333	3
P11	Artistxite	0.494647689	0.505352311	42.96	42.05	10	12	167.2941176	17
P11	ZIK	0.216163311	0.783836689	28.03	7.73	5	5	319.6666667	14
P11	Cdbaby	0.38120819	0.61879181	61.05	37.61	17	12	350.3333333	3
P11	Fairshare	0.07337214	0.92662786	68.45	5.42	20	4	227	4
P11	Palmares	0.016229713	0.983770287	78.8	1.3	18	7	193.8	14
P12	Artistxite	0.004663003	0.995336997	394.89	1.85	22	5	138.9230769	26
P12	7 Digital	0.379612258	0.620387742	19.84	12.14	3	7	292.3181818	21
P12	Fairshare	0.133909287	0.866090713	60.15	9.3	24	22	184.3571429	13
P12	Palmares	0.243490178	0.756509822	16.56	5.33	12	8	324.3157895	18
P12	Cdbaby	0.061663234	0.938336766	145.78	9.58	26	22	151.5	12
P12	Beatport	0.411469234	0.588530766	14.06	9.83	9	2	373.5	8
P13	7 Digital	0.731012658	0.268987342	0.85	2.31	2	5	353.6666667	9
P13	Fairshare	0.170502984	0.829497016	9.73	2	4	6	247	4
P13	Palmares	0.585279859	0.414720141	9.41	13.28	13	15	369.4	5

Participant	WebSite	% Search	% browsing	Fixation Duration Browse	Fixation Duration Search	Visit Count Browse	Visit Count Search	Sweep length	total # of sweeps
P13	Beatport	0.308447937	0.691552063	14.08	6.28	12	14	408.75	4
P14	Artistxite	0.384993984	0.615006016	56.23	35.2	28	38	217.25	4
P14	7 Digital	0.439448441	0.560551559	18.7	14.66	11	14	305.4	5
P14	Cdbaby	0.411752908	0.588247092	58.66	41.06	23	32	230.6666667	3
P14	Fairshare	0.419983753	0.580016247	14.28	10.34	11	23	262.2222222	8
P14	Palmares	0.225207756	0.774792244	27.97	8.13	13	11	216.375	16
P15	7 Digital	0.315300434	0.684699566	33.16	15.27	9	13	323.5	3
P15	ZIK	0.27759652	0.72240348	26.57	10.21	10	8	337.5	8
P15	Cdbaby	0.508614748	0.491385252	28.52	29.52	3	11	272.3333333	3
P15	Fairshare	0.063747585	0.936252415	29.08	1.98	7	6	204.5714286	14
P15	Palmares	0.093531224	0.906468776	64.74	6.68	31	20	239	6
P15	Beatport	0.434412668	0.565587332	23.93	18.38	12	12	209.5	2
P35	7 Digital	0.220705164	0.779294836	97.03	27.48	13	17	220.9	10
P35	ZIK	0.213350785	0.786649215	126.21	34.23	25	15	228.0909091	33
P35	Cdbaby	0.453421855	0.546578145	130.9	108.59	22	46	440	5
P35	Fairshare	0.125811966	0.874188034	25.57	3.68	14	7	194.5	6
P35	Palmares	0.418126216	0.581873784	20.93	15.04	6	2	221.125	8
P35	Beatport	0.603534054	0.396465946	23.11	35.18	9	13	270	5
P40	Artistxite	0.186746988	0.813253012	10.8	2.48	4	2	291	2
P40	7 Digital	0.481352294	0.518647706	19.33	17.94	6	10	327	4
P40	Cdbaby	0.83213966	0.16786034	3.75	18.59	1	10	251	3
P40	Palmares	0.022988506	0.977011494	22.1	0.52	8	2	237.5	2
P45	Artistxite	0.334856273	0.665143727	34.94	17.59	11	11	113.5	2
P45	7 Digital	0.762547448	0.237452552	5.63	18.08	5	7	344.4285714	9
P45	Cdbaby	0.545564031	0.454435969	11.32	13.59	3	5	230.6666667	3
P45	Palmares	0.863212435	0.136787565	1.32	8.33	3	2	125	2
P45	Beatport	0.527284681	0.472715319	14.38	16.04	6	6	291.7142857	7

Participant	WebSite	% Search	% browsing	Fixation Duration Browse	Fixation Duration Search	Visit Count Browse	Visit Count Search	Sweep length	total # of sweeps
P02	7 Digital	0.073572322	0.926427678	44.45	3.53	9	8	179	15
P02	Othermusic	0.081537302	0.918462698	121.88	10.82	15	8	133	2
P02	Fairshare	0.007839038	0.992160962	37.97	0.3	12	2	117.5555556	9
P02	Palmares	0.022925033	0.977074967	58.39	1.37	9	2	162.625	8
P02	Beatport	0.547958215	0.452041785	19.04	23.08	19	18	266.3333333	3
P08	Artistxite	0.74443455	0.25556545	5.74	16.72	2	9	238	4
P08	7 Digital	0.90990991	0.09009009	1.1	11.11	1	7	303.4666667	15
P08	Cdbaby	0.966322407	0.033677593	1.5	43.04	2	15	473	1
P08	Fairshare	0.662838392	0.337161608	4.11	8.08	11	9	102.5	2
P08	Palmares	0.565513997	0.434486003	18.47	24.04	14	13	194.625	8
P08	Beatport	0.273045618	0.726954382	76.81	28.85	26	22	219.3333333	3
P16	Artistxite	0.313043478	0.686956522	11.85	5.4	10	8	151.3333333	6
P16	ZIK	0.107584855	0.892415145	72.83	8.78	16	7	326.4285714	7
P16	Cdbaby	0.430473952	0.569526048	29.08	21.98	14	13	309.25	4
P16	Palmares	0.056497175	0.943502825	50.1	3	10	10	274.8333333	7
P17	Artistxite	0.307827757	0.692172243	43.24	19.23	13	11	284.5	2
P17	7 Digital	0.469402448	0.530597552	14.74	13.04	5	11	378	2
P17	ZIK	0.118868215	0.881131785	57.3	7.73	10	8	279.8571429	14
P17	Fairshare	0.178976615	0.821023385	35.46	7.73	5	7	262.1	10
P17	Palmares	0.054232134	0.945767866	18.66	1.07	4	3	138.5	6
P17	Beatport	0.510684222	0.489315778	22.67	23.66	15	12	238	1
P18	7 Digital	0.261152142	0.738847858	25.01	8.84	5	14	193	5
P18	Fairshare	0.119444444	0.880555556	22.19	3.01	7	9	330.5	2
P18	Palmares	0.399211712	0.600788288	32.01	21.27	14	23	349.1111111	18
P18	Beatport	0.240486341	0.759513659	48.1	15.23	12	7	274.2857143	7
P19	Artistxite	0.126144229	0.873855771	39.14	5.65	13	5	184.5714286	14
P19	7 Digital	0.076567587	0.923432413	87.92	7.29	12	10	435.8333333	6

Participant	WebSite	% Search	% browsing	Fixation Duration Browse	Fixation Duration Search	Visit Count Browse	Visit Count Search	Sweep length	total # of sweeps
P19	Fairshare	0.065791415	0.934208585	63.33	4.46	6	7	317.7333333	15
P20	Artistxite	0.21341286	0.78658714	54.07	14.67	7	17	225.25	4
P20	7 Digital	0.39742638	0.60257362	48.7	32.12	9	20	298.4615385	13
P20	ZIK	0.213451658	0.786548342	33.68	9.14	15	9	255.2352941	17
P20	Cdbaby	0.507162214	0.492837786	38.19	39.3	10	24	402.3333333	3
P20	Palmares	0.28256941	0.71743059	87.34	34.4	35	25	202.6	5
P20	Beatport	0.328257191	0.671742809	47.64	23.28	18	4	108.5	2
P36	Artistxite	0.364112388	0.635887612	49.79	28.51	18	36	292.7777778	9
P36	7 Digital	0.422214557	0.577785443	16.75	12.24	8	12	266.6666667	3
P36	Palmares	0.259713701	0.740286299	21.72	7.62	12	9	258.1666667	6
P36	Beatport	0.92481203	0.07518797	0.1	1.23	1	5	329.5555556	9
P41	7 Digital	0.138554217	0.861445783	61.49	9.89	12	11	404	5
P41	ZIK	0.185827815	0.814172185	61.47	14.03	18	16	249.6666667	3
P41	Cdbaby	0.295044651	0.704955349	40.26	16.85	11	12	299.0357143	28
P41	Fairshare	0.012125953	0.987874047	50.51	0.62	15	4	231.8333333	6
P41	Palmares	0.017788398	0.982211602	73.99	1.34	8	7	328.3777778	45
P50	Artistxite	0.188395666	0.811604334	69.66	16.17	33	30	239	3
P50	7 Digital	0.501629992	0.498370008	12.23	12.31	15	14	316.5833333	12
P50	ZIK	0.269210933	0.730789067	28.34	10.44	19	14	299.5	10
P50	Fairshare	0.838414634	0.161585366	1.06	5.5	3	10	205.4166667	12
P50	Palmares	0.082823694	0.917176306	52.49	4.74	18	7	258.6666667	6

Sweep length and number of sweeps for the intra-website visitor group

Participant	WebSite	% Search	% browsing	Fixation Duration Browse	Fixation Duration Search	Visit Count Browse	Visit Count Search	Sweep length	total # of sweeps
P03	Beatport	0.2963831	0.7036169	111.08	46.79	45	44	272.4814815	54
P05	Beatport	0.426669277	0.573330723	87.84	65.37	59	74	299.2962963	27
P09	Beatport	0.60613123	0.39386877	43.94	67.62	36	52	300.3030303	33
P10	Beatport	0.201931008	0.798068992	328.98	83.24	130	86	251.6153846	13
P22	Beatport	0.181799811	0.818200189	242.94	53.98	74	84	256.4090909	22
P26	Beatport	0.33087802	0.66912198	90.84	44.92	33	34	203.5714286	28
P29	Beatport	0.177758808	0.822241192	279.34	60.39	167	33	213.8571429	7
P32	Beatport	0.328000688	0.671999312	156.26	76.27	86	56	252.8275862	29
P34	Beatport	0.311431674	0.688568326	221.96	100.39	102	57	196.1176471	17
P38	Beatport	0.358886215	0.641113785	205.15	114.84	125	83	253.8	5
P42	Beatport	0.150176678	0.849823322	389.61	68.85	221	78	285.6486486	74
P23	Artistxite	0.243524532	0.756475468	193.34	62.24	67	71	200.6923077	26
P25	Artistxite	0.071516996	0.928483004	915.02	70.48	112	83	180.8	10
P27	Artistxite	0.134859533	0.865140467	297.79	46.42	72	57	220.3269231	52
P30	Artistxite	0.475162663	0.524837337	83.89	75.95	44	79	317.2666667	30
P33	Artistxite	0.149958037	0.850041963	313.98	55.39	88	57	192.2727273	11
P39	Artistxite	0.148882987	0.851117013	381.36	66.71	127	94	196.3225806	93
P43	Artistxite	0.032292823	0.967707177	296.37	9.89	59	23	172.5853659	41

Inter-website visitor group first visit:

Participant	Website	Fixation Duration Browse	Fixation Duration Search	% Browse	% Search	EOU
P01	Fairshare	114.33	10.21	0.918018307	0.081981693	6.777777778
P02	Othermusic	121.88	10.82	0.918462698	0.081537302	4.333333333
P07	Beatport	36.19	47.93	0.430218735	0.569781265	6.777777778
P08	Othermusic	28.77	11.1	0.721595184	0.278404816	4.333333333
P11	Beatport	48.97	2	0.960761232	0.039238768	6.777777778
P12	Beatport	14.06	9.83	0.588530766	0.411469234	6.777777778
P13	Beatport	14.08	6.28	0.691552063	0.308447937	6.777777778
P14	Beatport	9.88	5.78	0.630906769	0.369093231	6.777777778
P15	Beatport	23.93	18.38	0.565587332	0.434412668	6.777777778
P16	Artistxite	11.85	5.4	0.686956522	0.313043478	4.666666667
P17	Artistxite	43.24	19.23	0.692172243	0.307827757	4.666666667
P18	Artistxite	56.17	17.18	0.765780504	0.234219496	4.666666667
P19	Artistxite	39.14	5.65	0.873855771	0.126144229	4.666666667
P35	Beatport	23.11	35.18	0.396465946	0.603534054	6.777777778
P40	Beatport	1.19	14.93	0.07382134	0.92617866	6.777777778
P41	Artistxite	243.95	14.07	0.945469343	0.054530657	4.666666667
P45	Beatport	14.38	16.04	0.472715319	0.527284681	6.777777778
P50	Artistxite	69.66	16.17	0.811604334	0.188395666	4.666666667

Inter-website visitor group last visit:

Participant	WebsiteSite	Fixation Duration Browse	Fixation Duration Search	% Browse	% Search	EOU
P01	Othermusic	51.53	21.73	0.703385203	0.296614797	4.333333333
P02	Artistxite	34.37	8.93	0.793764434	0.206235566	4.666666667
P07	Cdbaby	262.98	7.54	0.972127754	0.027872246	6.444444444
P08	Artistxite	5.74	16.72	0.25556545	0.74443455	4.666666667
P11	Cdbaby	61.05	37.61	0.61879181	0.38120819	6.444444444
P12	Cdbaby	145.78	9.58	0.938336766	0.061663234	6.444444444
P13	Cdbaby	0.93	23.49	0.038083538	0.961916462	6.444444444
P14	Cdbaby	58.66	41.06	0.588247092	0.411752908	6.444444444
P15	Fairshare	29.08	1.98	0.936252415	0.063747585	6.777777778
P16	Cdbaby	29.08	21.98	0.569526048	0.430473952	6.444444444
P17	7 Digital	14.74	13.04	0.530597552	0.469402448	6.222222222
P18	7 Digital	25.01	8.84	0.738847858	0.261152142	6.222222222
P19	Fairshare	63.33	4.46	0.934208585	0.065791415	6.777777778
P35	Fairshare	25.57	3.68	0.874188034	0.125811966	6.777777778
P40	Artistxite	10.8	2.48	0.813253012	0.186746988	4.666666667
P41	Fairshare	50.51	0.62	0.987874047	0.012125953	6.777777778
P45	Artistxite	34.94	17.59	0.665143727	0.334856273	4.666666667
P50	Beatport	2.69	26.21	0.093079585	0.906920415	6.777777778

Intra-website visitor group first visit:

Participant	Website	Fixation Duration Browse	Fixation Duration Search	% Browse	% Search	EOU
P04	Othermusic	77.08	3.33	0.95858724	0.04141276	4.333333333
P05	Beatport	18.4	6.18	0.748576078	0.251423922	6.777777778
P09	Beatport	20.9	1.3	0.941441441	0.058558559	6.777777778
P10	Beatport	85.16	5.26	0.941827029	0.058172971	6.777777778
P22	Beatport	77.54	10.03	0.885463058	0.114536942	6.777777778
P23	Artistxite	71.36	8.96	0.888446215	0.111553785	4.666666667
P25	Artistxite	493.78	33.76	0.936004853	0.063995147	4.666666667
P26	Beatport	14.44	18.09	0.44389794	0.55610206	6.777777778
P27	Artistxite	34.96	5.1	0.872690964	0.127309036	4.666666667
P29	Beatport	55.79	31.06	0.642371906	0.357628094	6.777777778
P30	Artistxite	22.85	3.01	0.883604022	0.116395978	4.666666667
P32	Beatport	5.73	1.26	0.819742489	0.180257511	6.777777778
P33	Artistxite	90.93	9.21	0.90802876	0.09197124	4.666666667
P34	Beatport	99.24	19.46	0.836057287	0.163942713	6.777777778
P38	Beatport	25.63	3.43	0.881968341	0.118031659	6.777777778
P39	Artistxite	62.66	9.56	0.867626696	0.132373304	4.666666667
P42	Beatport	259.93	4.96	0.981275246	0.018724754	6.777777778
P43	Artistxite	3.72	0.78	0.826666667	0.173333333	4.666666667

Intra-website visitor group last visit:

Participant	Website	Fixation Duration Browse	Fixation Duration Search	% Browse	% Search	EOU
P04	Othermusic	35.57	3.65	0.906935237	0.093064763	4.333333333
P05	Beatport	5.28	6.85	0.435284419	0.564715581	6.777777778
P09	Beatport	11.38	1.25	0.901029295	0.098970705	6.777777778
P10	Beatport	16.35	9.16	0.640925127	0.359074873	6.777777778
P22	Beatport	44.34	23.65	0.652154729	0.347845271	6.777777778
P23	Artistxite	46.3	4.12	0.918286394	0.081713606	4.666666667
P25	Artistxite	190.64	7.69	0.961226239	0.038773761	4.666666667
P26	Beatport	12.6	0	1	0	6.777777778
P27	Artistxite	13.29	2.3	0.852469532	0.147530468	4.666666667
P29	Beatport	9.06	1.65	0.845938375	0.154061625	6.777777778
P30	Artistxite	0.87	11.41	0.070846906	0.929153094	4.666666667
P32	Beatport	20.41	16.6	0.551472575	0.448527425	6.777777778
P33	Artistxite	0.17	3.1	0.051987768	0.948012232	4.666666667
P34	Beatport	51.11	0.18	0.996490544	0.003509456	6.777777778
P38	Beatport	54.62	19.85	0.733449711	0.266550289	6.777777778
P39	Artistxite	74.34	10.68	0.874382498	0.125617502	4.666666667
P42	Beatport	5.86	13.09	0.309234828	0.690765172	6.777777778
P43	Artistxite	27.13	0.47	0.982971014	0.017028986	4.666666667

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