

## Internet-Based Information Consumer Theory

### A Baudrillard's Perspective

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**Abstract**—This paper proposes an Internet-Based Information Consumer Theory derived from Jean Baudrillard's work. Its aim is to support the analysis and development of Internet applications, and to maybe promote a better understanding of Internet users' behavior. Specifically, the four object value dimensions (functional, exchange, symbolic and sign) are interpreted from an Internet information point of view and a mathematical model is proposed. Then as methodological framework, the four dimensions of Internet-Based Information value together with the mathematical model are used to support an analysis of three categories of Internet resources: web search engines, social network websites and websites for selling. It is argued that for web search engines the proposed theory embodies recent advances and may promote further developments because nowadays models do not clearly or even consider the four dimensions. For social network websites, a hypothetical example tries to explain users' decisions; this understanding might help improving the social networks websites functionalities and might help to create new ones. Through an example, a website for selling is analyzed, where the four dimensions are highlighted and it is suggested that the mathematical model may lead to new models intended to improve its relation to the Internet user.

**Keywords**—Information consumer theory; consumer theory; internet; information retrieval

#### I. INTRODUCTION

How does Baudrillard's object value system apply to the information consumption in the Internet? In an attempt to answer this question, we propose an Internet-Based Information Consumer Theory.

In Baudrillard's work [1-3], the main drive in capitalist society was consumption rather than production. Hence, the focus was upon consumerism, and how different objects are consumed in different ways. From this perspective, an object may have four dimensions regarding its value [1]:

- *Functional*: it is the instrumental purpose value.
- *Exchange*: it is the economical value.
- *Symbolic*: it is the value that a subject assigns to an object in relation to another subject.
- *Sign*: it is the value within a system.

We analyze the information consumption in some cases such as web search engines, social network websites and websites for selling. The mathematical model obtained through the new interpretation of Baudrillard's work supports that analysis.

We organized this paper in accordance to the IMRAD structure: introduction, methods, results and discussion; which is adopted as part of the Uniform Requirements for Manuscripts Submitted to Biomedical Journals of the International Committee of Medical Journals Editors, 2008 update. We believe that adopting this structure would help search engines in international databases to store and to retrieve information within research papers in order to facilitate meta-analyses and systematic reviews.

#### II. METHODOLOGY

Our methodology is to consider the specific class of objects called information in the Internet paradigm and to give an interpretation of it according to Baudrillard's object value system. From that, we hope to provide a support to the analysis of the information consumption process over the Internet. Additionally, we present a mathematical model for assigning value to information in the Internet and we compare it to existing mathematical models used in Internet applications.

In the introduction, we briefly explain the four value dimensions of an object proposed by Baudrillard. Then in the Internet context, we should ask what the functional, exchange, symbolic or sign value of information is for an Internet user. In order to answer this question, we propose the following interpretation:

- *Functional*: it is the utility value of the information for the Internet user. That is, how useful the information is to the Internet user.
- *Exchange*: it is the economical value of the information. For instance, it is the value to buy or sell an advertisement, product, service, book, article, etc.
- *Symbolic*: it is the value that a subject assigns to information in relation to another subject. That is, it is the credibility of information provided by a subject to the Internet user who is receiving it, observing that a subject may be an Internet user, an institution, a company, etc.
- *Sign*: it is the value of the information within a system. For example, a website for selling third parties products may have rankings or labels that provide additional assurance over the quality or reliability of the third party seller which may influence the Internet user to buy its product, even if there is a cheaper seller in the same site, but without the label or in a lower rank.

At the moment we say that an object has four value dimensions it is almost immediate to imagine a vector space model to it. In addition to that, through cardinal utility theory in economics [5], we may have a consumer's utility function as:

$$\Phi_{\text{value}}(x) = w_1 \phi_1(x) + w_2 \phi_2(x) + w_3 \phi_3(x) + w_4 \phi_4(x) \quad (1)$$

where "x" is the object, " $w_1, w_2, w_3, w_4$ " are weights, i.e., real numbers, and " $\phi_1, \phi_2, \phi_3, \phi_4$ " are functions that assigns value to each Baudrillard's value dimensions – indexes 1 for *Functional*, 2 for *Exchange*, 3 for *Symbolic* and 4 for *Sign*, that is, we have an utility function for each value dimension.

Function (1) may not seem useful for real world applications, but in the Internet context, where mathematical functions are hidden almost everywhere, it shall have its value, as we try to show in the following section.

### III. RESULTS

#### A. Web Search Engines

A search engine is a computer program to retrieve information. As a research field in Computer Science, Information Retrieval (IR) [6] is a field that plays an everyday role in Internet users lives, because it is the core of search sites as Google [7], Yahoo [8] and Bing [9].

Information Retrieval systems are strongly based on mathematical models. In these systems, the IR problem is to partition a certain collection of objects in two subsets through a query, which would be a description of one of the subsets. The first subset would be the set containing the objects that best matches the query, while the second would be the set of objects that best differentiate from it.

A classical example is the Vector Space Model [6]. Normally in this model, documents are objects and queries are words, and in mathematical terms, both are represented by vectors. Then to do the partitioning, the similarity of a document vector to a query vector is obtained through the cosine of the angle between them. In the sequence, documents are ranked by decreasing cosine values. Actually, in this model different terms might also have different weights, similarly to function (1). Moreover, its mathematical function that computes the similarity of a document and a query may be written as our function (1), we may consider only the functional value dimension and its utility function would be the normalized dot product (or cosine), that corresponds to the specific query in question.

Basically, IR systems deal with the functional value of information. Although some of those systems already take into account the Internet user search history in an attempt to determinate the user preferences, it is not clear how to model or to evaluate it. However, in our Internet-Based Information Consumer Theory, three more dimensions may be used to model preferences.

Another approach to improve IR Systems was discussed in [10] by Benoit:

"An aesthetic turn might aid sincere inquiry into the necessary presuppositions of knowledge that are applied in

IR algorithms and consequently expand the scope and objective validity of knowledge and IR systems design."

In regard to Benoit's approach, because beauty is an imposed code within a system [3], beauty is part of the sign dimension. That is, function (1) considers aesthetic. Hence, it considers the functionality issue of usual IR systems and the aesthetic point of view altogether. Moreover, as a utility function for consumer preferences, it is an explicit mathematical model for Internet users' preferences, where individual preferences are determined by the weights and the uniqueness of each IR system is obtained by modeling differently each dimension's utility function.

#### B. Social Network Websites

A social network website is an online site that implements a social structure made up of individuals or organizations called nodes, which comes from network theory. Each node is connected by one or more relations that may reflect friendship, kinship, common interest, etc. Some examples of social networks are Facebook [11], Orkut [12] and Twitter [13].

The Internet user of social network websites clearly values the symbolic and the sign value of information. User relations to other users or organizations, affiliations to communities, etc. show the importance of the symbolic value, while the use of resources within the website by the user shows the importance of sign value. Moreover, when a user enters a community, he/she may be doing so according to some preference, interest or suggestion.

For instance, let us consider a person that sign-in to a social network website due to a friend's invitation. Probably, he/she starts probing the website for common friends, that is, by browsing his/her friends list of relations. After that, he/she may look for some specific friends in the network and then invite others to be part of it. Moreover, while doing that he/she may enter a community. Therefore, when the decision is taken because of a friend's influence then it is probably in the symbolic dimension, when the decision is due to a particular interest, as getting information about a specific equipment, then it is in the functional dimension, when the reason is a promotional event such as one held by a company where the first user to accomplish a certain task gets a product, a trip, etc., then it is an economical pursuit and that is in the exchange dimension, and finally, when being part of a community means some kind of acceptance in school, work or somewhere else, then it is in the sign dimension.

From the website's point of view, user profiling [14] is a requirement for user satisfaction and a growing field of research and investment, because it may be the difference why a user prefers to use one social network website instead of other. To understand why one user chooses one community or resource is the basis for developing new resources or improving existing ones. In that case, as profiling uses mathematical models, function (1) might be useful for understanding users' preferences. More than that in regards to a specific resource, to classify users' preferences in one dimension or to understand which dimensions it relies might help to improve it.

### C. Websites for Selling

A website for selling is an online site that sells or buys a product, service, book, article, etc., which implements what is called electronic commerce or e-commerce through the Internet. Some examples of web selling sites are Amazon [15] (web store), eBay [16] (auction site) and iTunes [17] (online music store).

All these websites intend to sell something, that is, they are consumer oriented. In order to better satisfy the possible client, or simply to sale, it is beneficial to seek a better understanding of the potential consumers. Particularly, according to Pawlett [18]:

“The system constructs us as free consumers, as people who buy the products that are for sale because we want them as they satisfy our needs. Indeed Baudrillard rails against the academic disciplines of sociology and economics for accepting the idea of *the consumer* as a given: as an ontological fact. For economists such as the influential J.K. Galbraith, humanity consists of free and self-conscious individual beings with identifiable sets of needs and the desire to satisfy them. But needs are not freestanding essences, instead *the system of needs is the product of the system of production*. Needs do not come about in response to particular objects, one by one, but are generated from a grid or code *as system elements*, not within a unique relationship between individual and object. The code then is a collective and unconscious social constraint, a morality, an obligation. The tautology that Baudrillard seeks to expose then is the mutually constructing nature of needs, desires and consumer goods – an unbroken circuit. Once we are convinced we possess *needs* we have already consented to the consumer system because it generates the principle of abstract needs in search of satisfaction. We may recognize that the consumer system does not satisfy our needs *properly* or fully, or that it rips us off in the process – but we tend not to question the existence of these freestanding, objective *needs*. The principle of *need* is, for Baudrillard, the crucial ideological construct of the capitalist system. And once consumers have invested value in the commodities they consume these values are *real*, they cannot be dismissed as false or fake, though they are certainly ideologically structured. To be a consumer is to be self-coding and is a considerable accomplishment demanding much time and effort. The consumer is required to act: to reflect, to decide, to choose – yet always within the particular, ideologically structured frame of reference that they exist within.”

Although this assertion was not aiming the consumer relation in the Internet, it is fully applicable to it, in particular to selling websites. Besides, it is natural to the Internet consumer to act. Actually, in order to consume a product through the Internet, an Internet user first consumes information and then he/she must reflect, decide and choose. Also, a product or object in the Internet is information, which may be more than a picture; it may be an entire website with text, photographs, videos, etc.

In the Internet context a consumer has many ways to decide to buy or not a product and many ways to get informed for choosing. The functional value may be clarified

through different sites. The exchange value may be quickly compared within a site and among sites. Nevertheless, the symbolic and the sign values may have greater influence in the consumer decision and that assertion is corroborated by increasingly systems within the selling websites to rank products and sellers, to classify their quality and to allow individual consumers to express their satisfaction and to sum them up.

As an example, let us consider the case of an Internet user that wants to buy a TV through the Internet. He/She may choose to buy it from the Amazon website [15]. So he/she would choose *Electronics* in the search bar and type *TV*, then press the button *GO*. In December 30 of 2010, this procedure returned 57,514 results, which seems to be a little inconvenient to the potential buyer. But he/she may know the basic specification of the desired product, such as, an LCD TV of 42 inches. In that case, he/she may select in the website in the part named *FEATURED TVs*, the *Display Size* – 40 to 49 inches, and the *TV Display Technology* - LCD, which would return 445 results, still a significant amount. But what if he/she prefers a certain brand, it may be due to his/her nationalism or it may be influence of a friend who might happen to be a technician that works with TV. For a matter of exemplification, let us choose the first brand, which happens to be LG, and then it would return 77 results. It is worth noticing that there were 15 brands not displayed in alphabetical order. Hence, the website provides a final resource, a field named *Sort by*, which offers five options: *Relevance*, *Bestselling*, *Price: Low to High*, *Price: High to Low*, and *Avg. Customer Review*. However, if the search started by choosing *All Departments* and typing *TV 42 inch LCD LG*, in the same day there would be 492 results, and the same search choosing *Electronics* would return 353 results. Amazingly, both new searches returned different values than the first procedure. Actually, the first search returned only TVs while the others returned also items as *Flat Screen TV Wall Mount Bracket*. For what is worth, this example was performed without user identification, in a computer without previous searches about TVs or any other electronics at all, that is, without history or profile of any kind.

In light of the Internet-Based Information Consumer Theory, regarding the first search, the choice of *Electronics* and *TV* are related to the functional value dimension. The second procedure, the choice of size and technology are still in the functional dimension, while the third procedure is in the symbolic dimensional value. The last possible choice presents five possibilities that are in different dimension. Both price options are in the exchange dimension. The bestselling and average customer review options are in the sign dimension. Unfortunately, we are not sure of what is the first criterion – relevance, hence we apologize for not classifying it. With regards to the second and third searches a search engine that considers all dimensions should produce the same result as the first and function (1) could be a starting point to do that.

Additionally, as websites for selling seek to improve their sales and their consumers' satisfaction, mathematical models are employed to evaluate the consumer profile in order to determine their individual communication to the potential

consumer [19]. Again, function (1) may be used to better understand consumer behavior and to mathematically represent it, which could help to create new models to satisfy, influence or predict the Internet user needs and desires.

#### IV. DISCUSSION

Because Internet changes the value of an object by adding information to it and information itself is an object in the system called Internet, Baudrillard's approach to consumption [1-3] through defining four value dimensions of an object is suitable to analyze information consumption in the Internet. Hence, interpreting these four dimensions in the Internet context provides a formal framework for analyzing Internet users' behavior, which is done in section II.

Additionally, as the Internet is computer based, and computers need structured information and mathematical models, a simple and generic mathematical model to represent Baudrillard's four dimensional system to value objects is proposed in function (1), which supports information consumption analysis. This mathematical model embodies existing Information Retrieval and user profiling models. It also extends them by highlighting other value dimensions such as symbolic and sign values.

Finally, advertisement seems to be almost everywhere in the Internet, especially in web search engines, social network websites and selling websites. As an example of the importance of advertising revenue, according to the Interactive Advertising Bureau [20-21], "U.S. Internet advertising revenues hit \$6.4 billion in the third quarter of 2010, representing the highest quarterly result ever for the online advertising industry and a 17% increase from the same period in 2009." Therefore, an Internet-based Information Consumer Theory may be helpful to support research on Internet advertising. Moreover, because of websites uses mathematical models in order to direct advertisement the proposed mathematical model may support future works.

#### REFERENCES

- [1] J. Baudrillard, *The Object System*, (1968) New York: Verso, 1996.
- [2] J. Baudrillard, *For A Critique of the Political Economy of the Sign*, (1972) St. Louis, Mo: Telos Press, 1981.
- [3] J. Baudrillard, *The Consumer Society*, (1970) London: Sage, 1998.
- [4] J. Baudrillard, *Simulacra and Simulation*, (1981) Ann Harbor: The University of Michigan Press, 1994.
- [5] P. Suppes and M. Winet, "An axiomatization of utility based on the notion of utility differences," *Management Science*, vol. 1, no. 3 & 4, Apr.-Jul. 1955, pp. 259-270.
- [6] C.D. Manning, P. Raghavan and H. Schütze, *Introduction to Information Retrieval*, 1st ed., New York: Cambridge University Press, 2008.
- [7] [www.google.com](http://www.google.com)
- [8] [www.yahoo.com](http://www.yahoo.com)
- [9] [www.bing.com](http://www.bing.com)
- [10] G. Benoit, "The *beautiful* in information – philosophy of aesthetics and information visualization," *Proc. International Conference on the Theory of Information Retrieval (ICTIR 09)*, LNCS 5766, Sep. 2009, pp. 338-341.
- [11] [www.facebook.com](http://www.facebook.com)
- [12] [www.orkut.com](http://www.orkut.com)
- [13] [www.twitter.com](http://www.twitter.com)
- [14] E. Manners, S. Coppens, T. De Pessemier, H. Dacquin, D. Van Deursen and R. Van de Walle, "Automatic News Recommendations via Profiling", *Proc. 3rd international workshop on Automated information extraction in media production (AIEMPro'10)*, ACM Press, Oct. 2010, pp. 45-50, doi>10.1145/1877850.1877863
- [15] [www.amazon.com](http://www.amazon.com)
- [16] [www.ebay.com](http://www.ebay.com)
- [17] [www.itunes.com](http://www.itunes.com)
- [18] W. Pawlett, "Against banality – the object system, the sign system and the consumption system," *International Journal of Baudrillard Studies*, vol. 5, no. 1, Jan. 2008.
- [19] J.A. Jacobi, E.A. Benson and G.D. Linden, "Use of electronic shopping carts to generate personal recommendations", *United States Patent*, no. US 6,317,722 B1, date Nov. 13, 2001.
- [20] [www.iab.net](http://www.iab.net)
- [21] [http://www.iab.net/about\\_the\\_iab/recent\\_press\\_releases/press\\_release\\_archive/press\\_release/pr-111710](http://www.iab.net/about_the_iab/recent_press_releases/press_release_archive/press_release/pr-111710) accessed in Nov. 30, 2010.