

Dr. Marco Paiola
University of Padova
University of Brescia
paiola@eco.unibs.it

On-line information search and consumer strategies: the effects of information sources biases

Abstract

Internet has potential enormous advantages in sustaining consumer information searching and decision making, but that positive role is not granted. At this time, it depends mostly on the way merchants, e-tailers and consumers react to the technological possibilities: particular concern is on the way information are selected, verified and communicated from the vendors to the consumers.

Our brief study highlights the principal problems that the literature has pointed out at this regard and tried to accomplish a light testing of some of these issues by observing the real behaviour of some Italian and French shopping agents (shopbots). The testing has confirmed the existence of a sensible differentiation, with some evidence that aided search in digital systems is still an evolving area. We describe - for a selection of seven shopping agents - differences in product lists representation, in product searching and selection factors, in the number of merchants considered and in the number of product offers per each merchant.

We discuss the effects of that evidence on critical factors affecting purchasing process, highlighting most important issues in terms of customer perception of complexity, and possible negative reflexes on willingness to use the net as an information searching tool and a real market for products and services. Need for further empirical evidence that explains facets of consumer behaviour on line is finally stressed.

The aim of this work is threefold: first, to screen most important problems in information searching in modern digital environments; second, to study the factors that affect consumer information search and purchase satisfaction; in particular we are interested in the effects of e-merchants tactics in using intelligent agents and their responsibilities in creating information asymmetries; third, to study the danger that biases and opportunistic behaviour of internet players could produce dissatisfaction and disaffection in the consumer.

1) Introduction: toward a consumer strategy?

There is no doubt that the world of consumption has a great power on our lives: it frequently has an irresistible attraction on us and it's an important mean of self defining, shaping the dimensions of our freedom as economic subjects. Thus, there is no activity more important than choosing in our every day life as consumers.

Unfortunately, the activity of choosing in the dynamic and global modern economies, has also a set of problematic reflexes that can compromise the enthusiasm and the sense of confidence in the picture of freedom drawn above. That relates directly to the enormous proliferation of information and data that modern technologies have made accessible through the web, and the real capacity of seeing and judging products and services alternatives. Information overload and information quality evaluation are the central problems in this picture.

So, internet has potential enormous advantages in sustaining consumer information searching and decision making, but that positive role is not granted. It depends on the way merchants, e-tailers and consumers really behave and react to the possibilities that technology puts in place, in particular

concerning the way information are selected, verified and communicated from the vendors to the consumers, and the ability of the latter in searching and using that information.

In our brief study we have highlighted the major problems that the literature has pointed out at this regard and tried to accomplish a light testing of some of these issues by observing the real behaviour of some Italian and French shopping agents (shopbots). The testing has confirmed the existence of a differentiated behaviour among operators, with some opportunistic actions, beside some evidence that aided search in digital systems is still an evolving area. We describe - for a selection of seven shopping agents - differences in product lists representation, in product searching and selection factors, in the number of merchants considered and in the number of product offers per each merchant.

We discuss the effects of that evidence on critical factors affecting purchasing process, highlighting most important issues in terms of customer perception of complexity, and possible negative reflexes on willingness to use the net as an information searching tool and a real market for buying products and services.

The aim of this work is threefold:

- First, to screen most important problems in information searching on modern digital environments, as underlined by the literature.
- Second, to study the effects of agents on consumer information search and purchase satisfaction, not always coherent with literature on the subject; we believe that advantages of the internet in providing an efficient and effective tool to support purchases is dependent to real behaviour of principal players on the web, such as producers, retailers and information brokers, and not on internet intrinsic characters; bias is very important even in an open environment like the net, as the habits of retailers and the way software is implemented and used by the consumer play a central role in real benefits it can guarantee; information democracy is not for free, but it appears to be still information asymmetries surviving.
- Finally, we address a second layer effect of digital information searching, that impact on consumer commitment; we think that biases and opportunistic management of the new information tools (especially shop and recommendation agents) can produce a real danger of disaffection in the consumer, boosting the possibility of choosing the exit option in several situations: - when purchase process on line has led to wrong selection and to a bad deal; - when intermediaries (in a broad sense) politics and tactics give the consumer the sensation of too much confusion and complexity (inefficiency) and to be a poor market in which make bargains (ineffectiveness).

Today, it's more important than ever to think about a strategy of the consumer, that is how the consumer can use power and resources to solve the high complexity of consuming tasks: at this end, the interactivity, ubiquity and velocity of the internet could be precious resources for transforming a passive consumer behaviour in a more modern and active one. That is, on the other hand, a big opportunity for evolving and proactive firms that need that kind of consumer to sustain dynamic innovation and differentiation strategies.

2) Information and consumer behaviour

No attempt will be made here to provide an exhaustive picture of the literature on consumer information search behaviour; that is simply too vast and differentiate, as it's based on disciplines ranging from economics to marketing, psychology, sociology, anthropology, geography. Furthermore research on consumer information search behaviour is pretty linked to research on consumer information processing and consumer choice behaviour, and a reconstruction of how these different perspectives relate each other is far beyond the scope of this work.

Consumer search behaviour has been a persistent topic of research, thanks to its relevance in the process of purchasing and its position at the beginning of the consumer decision process.

Anyway, we refer to the part of consumer information search behaviour named "external information search", consisting in pre-purchase problem solving activities normally goal-directed¹. Those activities can also entail a regular practice and an ongoing habit for the consumer, so typical topics of this research field are the *extent* and *duration* of information search process, but also what the *sources* of information are (media, people, personnel and distribution channels) and how much *time* the consumer spends in the search. Eventually a study of the *types* of information searched (relating the brand or the product, the negative or the positive content) completes the picture. Here we have an abundant literature that dates from the '70s till today, with a particular attention to offer models and frameworks for consumer information search analysis in the 1990s².

3) Consumer behaviour and the internet: towards a consumer empowerment?

First topic in a discussion relative to consumer empowerment is the consideration of the way consumers treat price information relative to products and services they have to purchase.

At this regard the literature shows that the internet and in particular search mechanism as agents have an important impact on the way people effect purchases and on the variables he /she considers most in the evaluation. The arguments of price sensitivity and the related possibility of creating a new frictionless economy are at the top of research topics.

The initial prediction of a general increase of price sensitivity and fierce competition due to lowered search costs through the internet have given the pace to a new generation of studies that examined the effects of lowering information search costs separating search of quality information and other information about prices and locations of product, partly proving the ideas of the literature inherent price and quality advertising.

No doubt that the internet can lower the costs of search for information about price and products available on the market³.

Firstly, some studies have set that improved access to quality information will decrease price sensitivity⁴: the electronic marketplace lower the consumer costs to acquire information about seller price and product offerings, allowing a new and different management of price and quality information in products and offerings. The impact of the Internet is particularly interesting in differentiated markets in which there is an easier access to seller prices that also increase the overall quality of price information reducing information asymmetries in helping buyers to know and separate different components of the final price - such as transportation costs and financial terms that can be smartly used by sellers to reduce buyer's price consciousness⁵. Quality of information increase also in the sense that software standardisation of product description may result in an advantage for consumers in the task of comparing products, and therefore better evaluate seller's offers values: the example given is that of airlines transportation reservation system.

The question regarding the effect of Internet on price sensitivity of consumers - that in initial papers seemed to be sure - appears to be more complicated. Anyway it's an important issue because the price on the internet could have a renewed role as an element in reducing indecision in buyer behaviour, if price sensibility would generally rise.

Although big expectations existed, price sensitivity hasn't shaped a new frictionless economy⁶.

Lynch and Ariely, using the wine on line market as a test case, have verified that lower search costs of gathering information about product prices result in an increase in price sensitivity, in a similar manner that has been observed in price advertising. Similarly to Bakos (1997) they found that this

¹ Peterson and Merino 2003, p. 102.

² Schmidt and Spreng (1996). For a global illustration of information search process problems, see Riquelme (2001).

³ Bakos (1991).

⁴ Bakos (1997).

⁵ Bakos (1997, p. 1690)

⁶ Brynjolfsson and Smith (2000).

fact is not generalised and it seems to be especially true with commodity-type markets, and in presence of a large number of sellers⁷. A high degree of real differentiation may boost consumer ability to make a better choice than in an off line shopping, and the situation is particular true with unique products that are sold by a small number of retailers⁸.

Furthermore it's important to underline that price, the most popular ordering variable for agents, isn't the only and most important factor in consumer final purchase decision.

By the way, price is not the only viable factor to sort results from an agent, and as you can see in the table several quality information can be used to sort results, with a variable level of detail depending on the agent orientation.

4) Information retrieval on the internet

As Peterson and Merino pointed out, the Internet is not likely to be an *information panacea* for consumers⁹. Information search still remains a complex task that needs a lot of investigation. However, there is no doubt that the Internet has had a series of important impacts on the way consumers can relate with information regarding products and services.

As we know, the net has an enormous effect on the accessibility of information, especially in terms of amount of information and the costs to get it: Internet can provide quantity and quality of information with minimal efforts and low costs, information that evidently can enter the process of buying and can facilitate the decision-making activity it requires.

But the one breaking difference the internet holds is not in the mass of information available: there was a lot of information even before the 'internet era', locally sited in newspapers, magazines and people; unfortunately, in this shape that world of information is hardly accessible just because it's not organised; of course this can convey negative reflexes on consumer behaviour.

Internet technologies easily permit the consumer to store huge amounts of data and information - generated dynamically and with custom relevance - in virtual locations, creating a limitless-like remote repository accessible any time and any place on demand.

The real value of the web as an instrument boosting decision capacity is the absolutely new possibility of having that information processed, stored and organised for further needs with no need to remember every little detail regarding a product, a service or a technology. The Web gives us "...*limitless amounts of product information and other reading materials can be summoned and then saved all in an instant far beyond anything possible in the real world of brochures, manuals and the memory and knowledgeability of salesclerks*"¹⁰. Particular importance is represented by screening quality information among very vast offers, that is also boosted by the proliferation of customisation automation technologies, unless the benefit of having access to the variety of the net is very poor for the customer¹¹.

The new fact is that the internet allows us to efficiently and effectively search, organise and share with others this information, giving us access to a mine of data previously inaccessible, that would have no value if no efficient mechanism to identify, select, catch and organise them was in place.

At this regard the capabilities of an interactive, dynamic and ubiquitous means as the internet are obviously enormous and quite completely to discover;

⁷ Lynch and Ariely (2000, p. 101)

⁸ In addition it all depends on the real use of the internet by the user: in the case the consumer learn about alternatives off line and then goes on line only to execute the purchase, little room remains for making the differentiation effects of the net prevail its huge advantages in terms of price information search and price information comparison (between sellers) for the pre-selected item, with a fatal predominance of price sensibility. That is particularly true in the case of substantially stable markets that by the way show a remarkable price volatility (due to promotions, for instance): once the real differences among products are learned by buyers, the net would represent a precious instrument for bargain hunting, capitalising on the ability of tracking and comparing prices on-line.

⁹ Peterson and Merino (2003, p. 99).

¹⁰ Underhill (1999, p. 216)

¹¹ Häubl and Trifts (2000); Häubl and Murray (2003); Trifts and Häubl (2003).

a. The role of software agents

This underlines the importance of software tools and mechanisms that run on the internet: browsers, search engines and intelligent agents (shopping and recommendation agents) have an important role in the process of information gathering on the internet, and they are all instruments that have an ongoing evolution in terms of searching flexibility and power.

The great development in the future may concern internet recommendation systems, already used in different ways and at various levels by primary internet firms like, for example, Amazon and Yahoo!. Agents help people identifying their needs, by keeping track of a person's interests and habits and notifying when a desired product or service matches the individual profile. Anyone can spend his own time more proficiently than regularly visiting shops and stores to see if any book or any other products of interest have been put on the shelf¹².

A software agent is a program that works on behalf of a human user, to give recommendations or to help choosing among products.

Agents can have two basic missions:

- 1) Facilitate the selection of shops, brands and products considering individual preferences.
- 2) Create a better understanding of the demand to producers and sellers¹³.

A big part of those mechanisms is constituted by electronic recommendation agents: they are software tools that allow to¹⁴:

- understand a human multi-attribute preference system in relation to a particular domain or product category based on a learning phase (called calibration) in which the consumer gives the agent information about subjective preferences;
- make recommendations in the form of a sorted list of alternatives based on its understanding of the individual preference structure¹⁵.

These agents, called recommendation systems, are basically of two types, content filtering and collaborative filtering, frequently used in parallel by the same firm. In effect the two have different mechanisms and therefore distinct aims¹⁶:

- Collaborative filtering is a kind of recommendation system that presents the consumer a list of suggestions based on opinions and buying behaviour of like-minded individuals; in other words, they extract pieces of the buying history of persons with a similar profile. That mechanism replicates the spirit of the word of mouth recommendations: they predict a person's preferences as a linear weighted combination (in the simplest cases it's a weighted sum) of other people's preferences. These systems have heavy limitations, thus they are unreliable if data are sparse and can be utilised only when preferences are already expressed and are accessible on the database; they are not adapt for new products. Finally they produce little or none explanation for the suggestions, reducing consumer's satisfaction with the personalisation process.
- Content based filtering (also called constraint based) is based on software that needs some hard and soft constraints from the consumer, such as the desirable range of product price, the type of colour of the shirt needed and so on. It makes recommendations on the basis of consumer's preferences for product attributes; it fits for new products but not necessarily incorporates information in preferences across individuals (even though there are systems that combine the two methods); like the above, they need preference information from the consumers.

¹² Maes (1999).

¹³ Those agents facilitate the analysis of the market, opening new possibilities in terms of: market analysis, consumer's tastes information, create consumer's profiles, mass customising offers following individual tastes. We don't analyse these tools deeply in this paper.

¹⁴ Haubl and Murray (2003, p. 75)

¹⁵ Another important class of recommendation agents is called community-based, and it doesn't involve a multi-attribute analysis of consumer preferences (Ansari Essegaier Kohli 2000).

¹⁶ Ansari, Essegaier and Kohli (2000, p. 364-5); Maes (1999, 69).

In both cases the agent comes out with a list of preferences that respond to the given inputs, usually ordered in terms of relevance.

Thus agents can help consumers to choose between retailers, searching for the same product or service in different stores and ordering the results using the criteria chosen by the consumer (typically the price). Similar products, normally provided by third parties, producers and retailers, are available on the net, such as bargainfinder.com, priceline.com and others (see *infra*).

Intelligent agents seem to fit particularly well in the two simple steps in which consumer decision making strategies have been divided into¹⁷:

- a recommendation agent (based on collaborative filtering) seems to fit best with the task of selecting a large set of available products, in order to identify a subset of the most promising alternatives;
- a comparison agent (based on content filtering) can help consumers to execute a detailed comparison among selected alternatives.

Consequently, interactive decision aids that may be used by consumers to shop on line encompass a variety of software tools that range from general purposes search engines (lycos, google) to sophisticated agent mediated electronic commerce systems (compare.net, jango.com). Their purpose can be:

- Searching *what* to buy (product brokering): they permit to search for a precise product, to compare prices of different products, have some recommendations for the fitness of a particular choice in consumer's frame of preferences. Product brokering agents can operate within a single merchant (amazon.com) or across merchants (kelkoo.com). These two are comparable if cross merchant databases are open to new accesses.
- Searching *from whom* to buy (merchant brokering), that allows the selections of stores and merchants.

Clearly, the consumer has several different other sources of information. Also in this case we have the problem of appraising the real value of the information that may extremely vary in extent, nature and consistency:

- Communities often produce a globally accessible word of mouth, preciously negative (see world groups on google), but that implies the problem of the identity of the person reviewing the product or service;
- third parties evaluations: here the problem is the fame and independence of the market or technology maven;
- information from producers and retailers, that are obviously biased in favour of positive (vs. negative) ones and frequently are limited in scope, if not artily modelled to hide problems.

b. Reach and richness: efficiency and efficacy of information processing on the net

As we have seen, internet shopping tools can display product alternatives most suited to the single person and provide information that enable the buyer to assess the level of correspondence between product functions and personal needs, facilitating the prediction of satisfaction after the use¹⁸; these things are allowed by the use of collaborative and content filtering in recommendation agents, as you can see in the practise of filtering of, for example, mysimon.com.

Efficiency and effectiveness of using digital aids in decision making have been long considered in the literature of decision support systems (DSS) mostly concerned with managerial decisions; from that literature we have indications that those instruments can produce deeper analysis and better decisions¹⁹. There is also evidence for the opposite: some empirical data underline that decision

¹⁷ Haubl and Trifts (2000, p. 4)

¹⁸ Alba et al. (1997, p. 46)

¹⁹ Haubl and Trifts (2000, p. 6).

making performance is not necessarily deepened by the utilisation of DSS; some other evidences tell that the impact of digital assistant on decision making performances is even negative²⁰. Anyway, further analysis show that intelligent agents can have strong favourable effects on both quality and efficiency of purchase decisions, and this will fit well with the well established notion that human decision suffers from the trade off between accuracy and effort²¹. In fact, Haubl and Trifts found that shopping decisions can be much better off while expending much less efforts with the use of a high quality digital aid²². But that's true in the case of agents that operate within a single merchant (while the same occur for cross-merchant searches in systems with open databases) and in the case of a goal-oriented shopping, that is a consumer with an object-oriented mindset²³.

TABLE 1
Dimensions Affecting Relative Attractiveness to Consumers of Alternative Retail Formats

Dimension	Supermarket	Department Store	Category Specialist	Catalog	Current Internet Retailer	IHS Format
Providing Alternatives for Consideration						
Number of Categories	Medium	Medium	Low	Low	Low	Low or High
Alternatives per Category	Medium	Low	Medium	Medium	Low	High
Screening Alternatives to Form Consideration Set						
Selecting Consideration Set	Medium	High	Medium	Low	Low	High
Providing Information for Selecting from Consideration Set						
Quantity	Medium	Medium	Medium	Medium	Medium	High
Quality	High	High	High	Medium	Low	Low or High
Comparing Alternatives	Medium	Medium	High	Low	Low	Depends on Supplier
Ordering and Fulfillment: Transaction Costs						
Delivery Time	Immediate	Immediate	Immediate	Days	Days	Days
Supplier Delivery Cost	Low	Low	Low	High	High	High
Customer Transaction Cost	High	High	High	Low	High	Low
Supplier Facility Costs	High	High	High	Low	Low	Low
Locations for Placing Orders	Few	Few	Few	Everywhere	Many	Many
Other Benefits						
Entertainment	Low	High	Medium	Low	Low	Medium
Social Interaction	Medium	High	Medium	Low	Low	Low
Personal Security	Low	Low	Low	High	High	High

See table 1²⁴ for dimensions affecting attractiveness of various retail format, that explain how the competition between new and old retail solutions can be won by internet only by surpassing what is still currently done on the side of quantity and quality of information on site. Of interest is also the comparison with the pure components of service that characterise modern distribution, in which internet could be really superior, given the well known weakness of information provision in bricks and mortar mall and shopping centres.

New internet home shopping systems (IHS) win the battle against traditional retail formats in providing alternatives for consideration, in screening capabilities in the consideration set and in providing information for selecting among alternatives in the consideration set²⁵. That is that internet will be able of lower information search costs even in presence of differentiated quality information²⁶.

As we can argue from table 1, Internet has the potential to become a superior tool to provide effective product information presentation formats in order to make a real comparison between offers and retailers.

²⁰ Todd and Benbasat (1992).

²¹ Payne et al. (1992).

²² Haubl and Trifts (2000, p. 6).

²³ New software and mechanisms will certainly be available in the near future that can also offer a rich sensorial experience beside of the information abundance, speed and low search costs typical of the internet context: the aim is to marry the efficiency of the technology with the richness of the experience in physical shopping, for example in the case of restaurants (Tewari Youll Maes, 2003), using a multi-tiered multi-attribute brokering system.

²⁴ Alba et al. (1997, p. 40)

²⁵ *Idem*.

²⁶ Lynch and Ariely (2000).

But the adoption and subsequent growth of internet-based purchasing processes is dependent on some critical factors²⁷:

- *Provide selection*; the format must allow quick and complete inspection of a set of options, vaster than what can be accessed through local shopping, also with a good reproduction of descriptive and experiential product information;
- *Allow screening* in a way that's easy to find the offerings that fit best in order to get into detailed analysis; unless the large number of options founded would be inaccessible for costs of search outweigh advantages of variety;
- *Reliability* of the decisions and of the choosing process and its mechanisms, compared to that possible in the setting of a dept. store;
- *Product comparison*, further to information selection, in order to give consumers a tool to decide;
- *Memory* of past selections in order to simplify information retrieving and decision support.

5) Unresolved issues: what lays beneath the net? (limits of the tools)

We can see that internet search mechanisms have potentially the power for satisfying all the characteristics shown in table 1. But one of the biggest issues in information searching on the net is the evaluation of the quality of the source and of the information and data obtained.

*"The potential for systematically manipulating consumer behaviour in digital marketplaces via the design of digital decision aids is very high"*²⁸. Electronic decision aids for online shopping can have a great influence on consumer choice behaviour on line. They create new models of preference construction for the consumers, who not always know what they want and who are extremely sensible to external influences in their not perfect decision process²⁹. Consumers frequently base decisions on heuristics³⁰, and tend to construct preferences on the spot, depending on the pressure of the external environment³¹.

The preferences are dependent on the particular framework used to represent the problem and on the format used to present relevant information³². That's particularly important in the case of internet advice systems, due to the increasing importance of their use and their central role as a decision tool that we know plays a central role in preferences construction³³. And even more interesting is the fact that the influence played by mechanisms utilised on line persist even in the off-line purchase setting³⁴.

But what's the impact on customer behaviour of the different models of showing search results, outcome of the selection process of product and services? As Diehl and others remember us, although we can get insights from the marketing literature, no specific study has been carried out at this regard: there is empirical suggestion from '70s that anything that makes an important attribute easier to process, would increase that attribute importance in the decisional process³⁵. In addition, Häubl and Murray found empirical evidence of the fact that the preference in human decision can be influenced in a systematic and predictable manner by merely altering the composition of the set of product attributes included in the shop agent interface; in particular the inclusion of an attribute in a recommendation agent give to it a higher importance in consumer's mind. Furthermore this

²⁷ Alba et al (1997, p. 39; 44)

²⁸ Häubl Murray (2003, p. 87)

²⁹ Riquelme (2001).

³⁰ Tversky Kahneman (1974).

³¹ Payne and Bettman (1992).

³² Slovic (1995).

³³ Bettman, Luce and Payne (1998).

³⁴ Häubl and Murray (2003).

³⁵ Diehl, Kornish and Lynch (2003, p. 57).

preference construction has a persistent effect in following shopping experiences even if no agent is available, like in off-line settings³⁶.

We know that the act of including or not some characteristics of the product in the format used for product presentation definitely affects the ultimate decision of purchase. In particular there is an "inclusion effect", that is the growing importance of a variable that is included (added) among testing and ranking factors by the engine³⁷. For example a selective inclusion of one attribute may be finalised to strategic motivations, like de-emphasise specific attributes of some products, that depend only from who's in charge to control the agent.

Research shows that tactic expansion of the choice portfolio can have a huge impact on the ability to choose: in particular, adding a non-attractive alternative to the consideration set can considerably lower the probability of a no-choice option, because it gives immediate new role and appealing to higher level options³⁸. That's a relevant point for us, because it can influence consumer behaviour beyond the relevance of atmospheric variables and service addition to the offer; since the politics and bias of agents and engines could be informed by this fact, this ends up limiting the above mentioned extension of information search horizon and choice that's a prior characteristics of the internet.

Less co-operative recommendation agents may silently omit certain products or entire classes of products (all models of a brand or of a retailer), or utilise biased algorithms to generate a personalised list of recommended products (attenuating the importance of price and boosting the position in the rank of certain alternatives). Real world agents are fatally biased and selective, that is they consider only a part of the pertinent product attribute, exactly those introduced in the structure of the agent - for example those that are mostly common among products, or those that are quantitative, or those that are easier to manage and to track over time, and that is used by the agent to refine the profiling of the person and therefore to calibrate (see google shopping guides and others). Furthermore, the availability of a recommendation agents based on a collaborative filtering, pushes people to reduce pre-purchase information seeking³⁹.

Consumer will prefer retailers that freely provide information that empower the customer, such as permitting comparison across retailers in a simple and fast way, also providing the possibility of cross shopping. An important issue in cross-merchant agents is the number of retailer considered in the database from which product and prices are taken. The question is to allow on line shoppers to direct access a common database of products not discriminating on the base of who's the vendor (vendor bias).

But vendors may build information walls to isolate and separate their offer from the others, in order to make it difficult to compare information on the product to those of the competitors. The information control is often in the hands of vendors, who dictate the ways and extent of information search so global cross-merchant searches may be compromised by individual actions taken by vendors.

As we see also intelligent agent use has several limitations, mostly related to the hidden behaviour of producers and retailers, that may cooperate with agents and bias agent's results in at their sake, or it can decide to differentiate informations given by servers in the case the request comes from an agent rather than from an end user⁴⁰.

Those are the reason why it's important to verify who's the owner of the agent:

- the *consumer* (such as one of the off-line software packages that are available on the market);
- the *retailer* (such as mediaworld.it and fnac.fr) that build agents usable within their own assortment;

³⁶ Häubl and Murray (2003, p. 87).

³⁷ Idem, p. 76.

³⁸ Dhar (1997, p. 229).

³⁹ Häubl and Trifts (2000).

⁴⁰ Maes (1999, p. 71).

- a (independent) third party (such as altroconsumo.it), that normally serves to search and compare products from different vendors.
- a category expert (such as financial maven on line)
- an *infomediary* (such as kelkoo.com that belongs to yahoo!).

Long term outcomes of this situation will be determined by technology and market forces, that will determine the extent in which consumers can access market information they need.

Another problem that hasn't been worked out yet, neither with the help of the internet and its mechanisms, is the power of inaction that in particular situations arise when the set of alternatives doesn't permit to distinguish one definitely better than another. Small differences in attractiveness between alternatives are reversible and thus consumer may lead to inaction; inaction appeal encompasses the generalised preference for status quo, that has several by-advantages like holding flexibility of future choice still and avoiding responsibilities and psychological regret as a poor purchase consequence⁴¹.

The indecision can also bring to the decision of continuing searching, if the trade off between expected benefits of the search activity and its costs is favourable. If the attempt to find a dominance structure in the alternatives in order to highlight a promising choice fails, no-choice option may be chosen⁴².

In summary, indecision and no choice preference can be based on rational search problems, trade off difficulties, and preferences uncertainty: obviously it's very important to distinguish among them.

Even though indecision has a psychological precedent in human omission bias - that can be nurtured by a not well constructed and clearly organised rank of preferences - it can be boosted when there aren't clear differences in ranking of the alternatives and can be affected by the way alternatives are manipulated and shown.

6) An initial comparison among Italian and French shopbots

To initially try to verify and test theoretical guidelines provided from the literature, we have arranged a small comparison among famous shopbots, both in Italian and French markets. Table n. 2 summarises key information we have gathered from this minute investigation. We have chosen some European shopbots in order to consider merchants effectively reachable from any place in Italy or France.

Table 2 - First comparison of shopbots: search for "nokia 6600".

Shopbot name	Owner (if declared)	Categories (Total)	Searching variables	First rank	II ranking	Merchants (offers) in the search	Merchant info / evaluation	Site versions
Kelkoo.it	Yahoo!	17	5 (brand, price, standby, weight, camera/MP3)*	margins	Product, price, merchant	19 (30)	Yes/no	10 (europe)
Costame no.it	Display spa	23	3 (brand, model, price)	price	Product, price, merchant	19 (35)	Yes/no	I
Virgilio.it	Matrix spa	19	2 (brand, price)	Unknown, margins	Product, price, merchant	7 (11)	Yes/no	I

⁴¹ Baron and Ritov (1994).

⁴² Dhar (1997, p. 216). Not to buy must be included in the range of alternatives the consumer has. For the discussion of the point see (Dhar 1997), that focuses on consumer uncertainty rather than certainty.

CONVEGNO "LE TENDENZE DI MARKETING"

				?					
Trovaprezzi.it	?	25	1 (price)	price	Product, merchant	price,	25 (46)	Yes/no	I, E
Kelkoo.fr	Yahoo!	17	5 (brand, price, standby, weight, camera/MP3)*	margins	Product, merchant	price,	22 (34)	Yes/no	10 (europe)
Monsieur prix.fr	?	8	2 (brand, price)	price	Product, total transport merchant.	price, price, costs,	15 (34)	Yes/no	F
Buycentral.fr	?	14	1 (brand)	price	Product, merchant	price,	9 (30)	Yes/no	F, I

* useful for needs definition

As you can see in appendix, Kelkoo way of consumer interaction is very complete with high transparency of total prices, included transport (they can vary from 6 to nearly 20 euros). The way of getting information from the consumer is very complete and effective also for very initial information searching, using a lot of variables in helping the consumer to identify the right products. From this point of view, it seems to emerge two different families of bots, depending on the intelligence that resides in them: searching mechanisms that need prior information to be effectively used (then they can be very efficient to find the best prices); mechanisms that help consumer to understand their needs and to choose, using search and results ranking on basis other than price.

The presence of two versions of kelkoo's sites, Italian and French, is due to the interesting differences emerged in comparing them, not only limited to the language; not only prices are significantly different, but also the presentation of the variables of the searching mask differ in the two cases, highlighting and positioning characteristics of the offer differently (see appendix). The way products searched are showed is finally similar, with a clickable popup information on the retailer specific information, but no site evaluation ranking from customers or experts.

Also Costameno.it doesn't provide merchant evaluation; it even doesn't declare the cost of transport, so the price is less transparent. Search interface is very simple with brand model and price to select from. In trovaprezzi.it the search is based only by screening prices: that's the only feature you can use to navigate in offers; so it's better to have a clear idea of what to buy and use the bot to check out the lower price. Same observations apply for shopping.virgilio.it and buycentral.fr, with the difference that for the latter the principal search variable is product brand.

An important issue seems to emerge from the comparison between number of merchants and total number of product hits; that issue relates to unlike differentiation strategies of bots and merchants too, that lead to offer bundling; here different product and product - services bundles and, therefore, prices levels emerge from the offer of the different and even the same merchant, in correspondence with the addition to the product of a series of accessories (batteries, covers, earphones etc.); other few times it is due to the existence of two prices at the same merchant for the same product. Comparing offers for Nokia 6600 in Kelkoo France and Italy we can note that in France there is a higher presence of product bundles that seems to push prices up in relation to prices in Italy. It's important here to note that in each country different bots have quite the same merchants in the database.

On the other side Kelkoo.fr has introduced a new engine that searches product in all the net, that's called TOUT, and for the same research "nokia 6600" it gave different results: "*Vous avez cherché 'nokia 6600': Réponses 1-20 sur un total de 23,287 résultats (chez 109 marchands)*". But it's a simple search engine and results, that include every category of accessories, that can't be ordered in any manner once displayed. The search involves the same group of shops, even if the sequence of the display is different, but with no apparent logic, and furthermore best bargain result with the utilisation of the agent is not there anymore.

Remaining on the case of kelkoo, we can add that first presentation of results is not in price order. Bottom page merchants are world operators, but sorting by price we find that best prices are in local

operators, not being transportation costs the difference reason; new operators previously not considered are in the game, that way. Best vendor of the default ranking has now the 7th price level. Anyway prices (on kelkoo.it) are variable - in a sensible style - day to day.

But what are the rules of the initial ranking? Certainly it's made on the basis of the unit margin granted from the retailer, as is reported in "conditions of affiliation" (http://it.kelkoo.com/b/a/co_5054_affiliazione.html): "*Visibilità e posizionamento dell'offerta del merchant sono proporzionalmente legati al valore marginale corrisposto (modello del pay-per-rank)*" (see appendix on terms and conditions for kelkoo and the reasons for association); that's probably why bigger retailer initially get first positions. In any case the mission of the broker is clearly stated in a very similar way both in France and in Italy. In the French site that point is clearly set, but unfortunately, there is no correspondent function in the Italian version (see appendix again).

The research for the same product on costameno.it led to interesting results: the same vendor (Mallteam.com), that appears also in kelkoo.it database, shows here a very different price (262 euros the former and 242 euros the latter); furthermore, trying to check first three results in the price ranking, on the merchant's site it came out that the prices on costameno.it were not exact, being the real prices higher. This is a further important fact we have noticed in this little search: not so infrequently price offers are not confirmed visiting the site of the merchant, and in other occasions products are not available at the promised prices (that's particularly annoying when it interests best bargains - see appendix again for a model of discharge conditions).

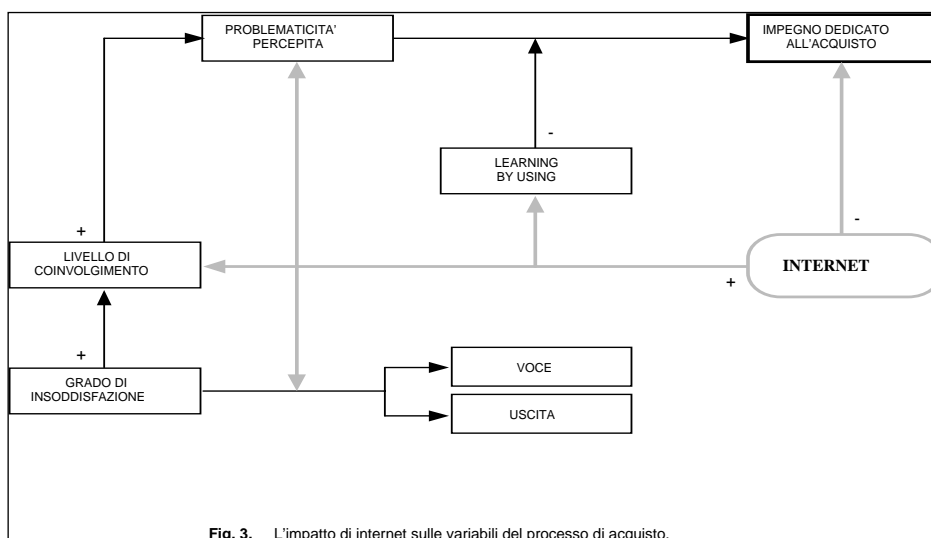
None of all the bots analysed has systems of collaborative filtering. They are used by amazon.fr, but unfortunately the French section of the big retailer - unless the American 'mother' - doesn't sell mobile phones.

This brief essay gives us the real sensation that although standardisation is very high in software and on line servicing solutions, big differences still exist between shopbots; further research is certainly needed.

7) Conclusion and discussion

In order to discuss the problems emerged in the previous pages we use a model of consumer commitment previously elaborated⁴³. It is a simple model that tries to put in evidence critical factor affecting consumer involvement in the purchasing process, with particular attention on the first phases in which the complexity of the buying process is faced.

⁴³ Grandinetti and Paiola (2003).



In our view, opportunistic merchant habits and sub-optimal exploitation of internet's as an instrument of diffusion and elaboration of information, can have some important and dangerous side effects on its real affirmation as an efficient and effective instrument in the strategy of the consumer, as an information search tool and a viable product and services market:

- Bad functioning of internet based search and shop agents may cause a perception of disorder and complexity that higher the perceived problematic nature of the purchase, in terms of intrinsic complexity of the product itself, the easiness of efficiently represent and manage the set of alternatives and the capacity of understand the linkage between product functions and consumer needs. Particular importance can be played, at this regard, by the great differentiation of scope and consumer interfaces used by search agents, the evidently biased selection of merchants and the extremely rapid fluctuation of prices for the same product at the same store.
- This could lead to minor levels of satisfaction with the use of the net compared to traditional distribution solutions, in which more stable and clear communication can easily be found.
- Some implications refer to the capacity of sustaining and protecting learning effects in the utilisation of internet tools: rapid changes in filtering models and the extreme volatility of some internet adventures may nullify prior experience in interacting with software, because they not easily replicable in other contexts.
- At the end this could bring to:
 - a. Heuristics, that become interesting solutions when complexity goes beyond consumer simplification ability and
 - b. Higher rates of exit decisions, with a possible return to off-line well known settings.

8) Limits of the paper and further analysis

We have no difficulties in admitting that the limits of this brief work are simply evident: in effect its purposes were just to unveil problems and make suggestions in a field that needs a lot of empirical testing. We try here to identify lines of in depth study as a possible research program for the future:

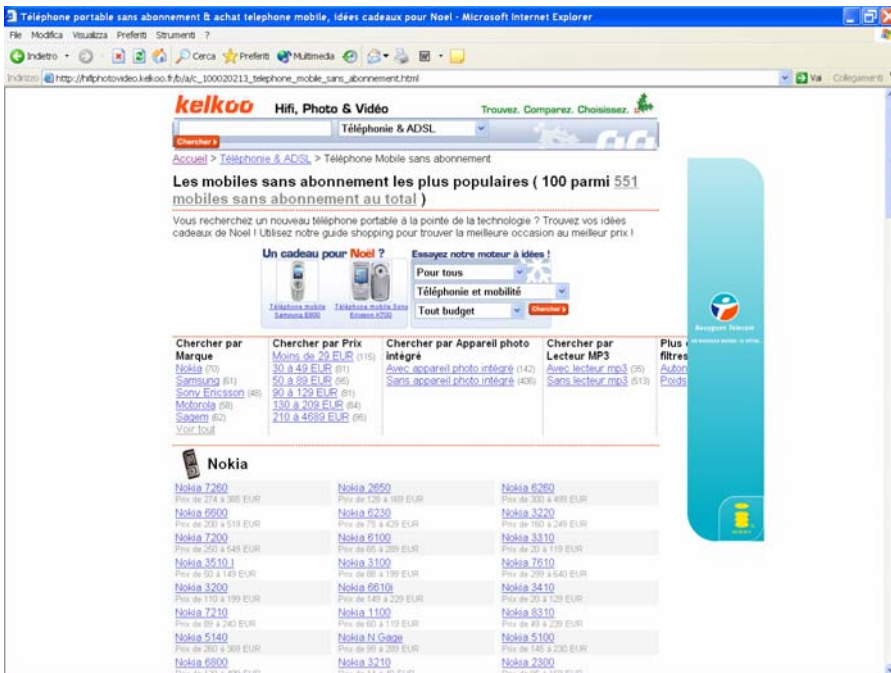
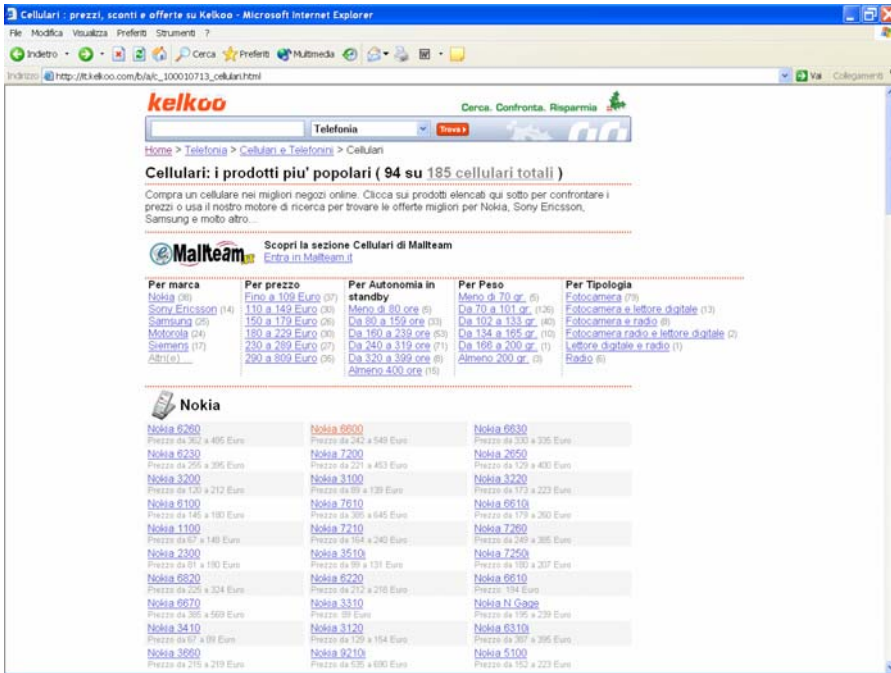
A series of empirical testing of the problems emerging from the study are needed, in order to verify:

- The impact of on-line information search tools on different dimensions of purchase complexity (Inherent to product, benefits-needs evaluation, choosing among alternatives), and the resulting impact on consumer commitment. In particular a check on effects of price fluctuations overtime and interactive frame changes overtime would be interesting.

CONVEGNO "LE TENDENZE DI MARKETING"

- The role of agents in consumer needs identification: kelkoo.com would be an interesting case to work on.
- Differences in the levels of service between internet distribution channels. A comparison among European countries would be worth it.
- Effects on possibilities to enhance learning habits

Appendix A - Different masks for kelkoo.fr and kelkoo.it



Appendix B - Kelkoo's information

Sul sito italiano:

Termini e condizioni

L'utilizzo del sito Kelkoo è regolato nei termini e alle condizioni qui di seguito riportate, fermo restando il diritto di Kelkoo di modificare in ogni momento e senza preavviso le condizioni di accesso e di utilizzo.

Il sito Kelkoo costituisce soltanto una guida all'acquisto su internet e non contiene alcuna proposta, offerta al pubblico o, comunque, altra tipologia di invito a contrarre. Conseguentemente Kelkoo non assume in alcun modo alcun obbligo di contrarre.

Le informazioni e i suggerimenti riportati sul sito Kelkoo possono contenere inesattezze, omissioni, lacune ovvero non essere più aggiornati. La società Kelkoo declina conseguentemente ogni responsabilità per quanto riguarda il loro contenuto e non presta alcuna garanzia con riferimento alla completezza e alla esaustività delle stesse.

Il servizio proposto da Kelkoo consiste unicamente nell'orientare l'utente su altri siti dai quali sono state reperite le informazioni senza alcuna responsabilità per la società Kelkoo. Pertanto Kelkoo non presta alcuna garanzia circa l'esattezza dei testi, delle informazioni, delle immagini e di tutti gli altri elementi presenti sul sito e non è in alcun modo responsabile per la qualità dei prodotti e servizi pubblicati sul sito.

Kelkoo infine non è in alcun modo responsabile per ogni e qualsiasi danno o pregiudizio connesso all'utilizzazione delle informazioni, dei prodotti e dei servizi pubblicati sul sito.

Source: http://it.kelkoo.com/b/a/co_5049_termini_e_condizioni.html

Come viene remunerato Kelkoo

Kelkoo offre un servizio gratuito per l'utente finale finanziandosi attraverso le commissioni dei merchant e dei brand che sponsorizzano il nostro sito. La remunerazione avviene sulla base di un costo per lead (click, contatto) corrisposto dal merchant per esporre la propria offerta sul nostro sito. Visibilità e posizionamento dell'offerta del merchant sono proporzionalmente legati al valore marginale corrisposto (modello del pay-per-rank). Kelkoo si finanzia, infine, attraverso la pubblicità allo stesso modo di altri websites o media.

Perchè collaborare con Kelkoo?

Kelkoo, società del gruppo Yahoo!, è il motore di ricerca per lo shopping on line leader in Europa e in Italia.

La nostra missione è quella di distribuire contatti commerciali agli e-tailers e ai brands più prestigiosi, costruendo relazioni di lungo periodo. Il traffico da noi generato e fornito è qualificato (leads), e rappresenta una concreta opportunità di business. Gli utenti infatti usano Kelkoo per raccogliere informazioni su beni e servizi che acquisteranno nel breve periodo on e off line. Opportunità non meno importante è quella di poter lavorare sulla consapevolezza e sull'immagine del brand dei nostri clienti, sia con strumenti tradizionali che innovativi.

Questi sono i nostri numeri:

Oltre 2.000.000 di Utenti Unici (Settembre 2004) visitano Kelkoo mensilmente, per un totale di oltre 24 milioni di pagine (dati Nielsen Netratings).

Source: http://it.kelkoo.com/b/a/co_5054_affiliazione.html

Discharge terms can be reached at the end of the page of search results:

Le informazioni d'offerta pubblicate su queste pagine sono fornite direttamente dagli operatori commerciali referenziati da Kelkoo. Pertanto, nonostante Kelkoo sia molto impegnata sulla qualità generale del proprio servizio, non può assumersi alcuna responsabilità sulla correttezza di tali informazioni e ti invita a verificare nel website dell'operatore prescelto la loro precisione e validità. Tutti i prezzi vogliono essere comprensivi d'IVA oltre che delle eventuali spese accessorie (costi di spedizione, altre tasse, etc etc) considerando come transazione standard l'acquisto del singolo prodotto, pagato con carta di credito e spedito tramite corriere espresso.

Anche in merito alle informazioni sui prodotti, Kelkoo cerca di garantire la migliore accuratezza ma non può assumersi responsabilità per eventuali imprecisioni. Per aiutarci a garantirti sempre la massima qualità di servizio, ti invitiamo a contattarci per comunicarci eventuali inesattezze da te identificate. [Clicca qui](#).

Sul sito francese:

Quels résultats sont proposés ?

Kelkoo est un service de comparaison unique en Europe qui vous permet de comparer en un clin d'œil les milliers d'offres de centaines de marchands sur Internet.

Les résultats qui vous sont fournis ne sont pas exhaustifs de l'ensemble des offres disponibles sur le marché et proviennent des données recueillies directement par Kelkoo auprès de certains marchands, soit en temps réel, soit avec un rafraîchissement périodique selon le type de données.

La présentation des données peut dépendre de plusieurs facteurs, notamment la pertinence des données des marchands référencés par rapport à votre requête, la vitesse du temps de réponse du site desdits marchands ou bien encore la nature des accords techniques et/ou commerciaux que Kelkoo peut entretenir avec tel ou tel marchand, etc.

Source: popup "*Plus d'infos sur les résultats*" in the search result page (there is no correspondent function in the italian version).

References

- ALBA J., LYNCH J., BARTON W., JANISZEWSKI C., LUTZ R., SAWYER A., WOOD S., *Interactive home shopping: consumer, retailer, and manufacturer incentives to participate in electronic marketplaces*, in "Journal of Marketing", Vol. 61, July, 1997.
- ANSARI A., SKANDER E., KOHLI R., *Internet recommendation systems*, in: "Journal of Marketing Research", vol. 37, 2000.
- BAKOS J.Y., *A strategic analysis of electronic marketplaces*, in "MIS Quarterly", september, 1991.
- BAKOS J.Y., *Reducing buyer search costs: implications for electronic marketplaces*, in "Management Science", Vol. 43(12), 1676-1692, 1997.
- BRYNJOLFSSON E., SMITH M.D., *Frictionless commerce? A comparison of internet and conventional retailers*, in "Management Science", Vol. 46(4), 563-585, 2000.
- DIEHL K., KORNISH L., LYNCH J.G. JR., *Smart agents: when lower search costs for quality information increase price sensitivity*, in "Journal of Consumer Research", Vol. 30 June, 2003.
- DHAR R., *Consumer preference for a no-choice option*, in "Journal of Consumer Research", Vol. 24 September, 1997.
- GRANDINETTI R., PAIOLA M., *Impegno e voce del consumatore nei processi di acquisto*, in "Atti del Convegno "Le tendenze del marketing in Europa", III ed., Cà Foscari, Venezia 28 novembre, 2003.
- HÄUBL G., MURRAY K.B., *Preference construction and persistence in digital marketplaces: the role of electronic recommendation agents*, in "Journal of Consumer Psychology", vol. 13 (1-2), 75-91, 2003.
- HÄUBL G., TRIFTS V., *Consumer decision making in online shopping environments: the effects on interactive decision aids*, in "Marketing Science", Vol. 19(1), 4-21, 2000.
- LYNCH J.G., ARIELY D., *Wine online: search costs affect competition on price, quality and distribution*, in "Marketing Science", Vol. 19(1), 83-103, 2000.
- MAES P., *Smart commerce: The future of intelligent agents in cyberspace*, in "Journal of Interactive Marketing", vol. 13(3), 1999.
- PAYNE, J.W., BETTMAN J.R., *Behavioral decision research: A constructive processing perspective*, in "Annual Review of Psychology", Vol. 43, 87-131, 1992.
- PETERSON R.A., MERINO M.C., *Consumer information search behaviour and the Internet*, in: "Psychology and Marketing", Vol. 20(2), 99-121, 2003.
- RIQUELME H., *Do consumers know what they want?*, in "Journal of Consumer Marketing", vol. 18 (5), 437-448, 2001.
- ROTFELD H.J., 2000, *Misplaced marketing, dumbth adventures in retailing*, in: "Journal of Consumer Marketing", vol. 17, n. 5.
- SCHMIDT J.B., SPRENG R., *A proposed model of external consumer information search*, in "Journal of Academy of Marketing Science", Vol. 24(3), 1996.

- TEWARI G., YOULL J., MAES, P., 2003, Personalized location-based brokering using an agent-based intermediary architecture, *Decision Support Systems*, Vol: 34, Issue: 2, January, pp. 127-137.
- TRIFTS V., HÄUBL G., *Information availability and consumer preferences: can online retailers benefit from providing access to competitor price information?*, in "Journal of Consumer Psychology", vol. 13 (1-2), 149-159, 2003.