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Electronic agents on the Internet:
A new way to satisfy the consumer?

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Electronic agents on the Internet:
A New Way to Satisfy the Consumer

Abstract

Our purpose in this article is to present the concept of electronic agent used in e-commerce and its impact on consumer satisfaction. Electronic agents represent the future of electronic business. They help the consumers in an environment where all the information is available but hard to deal with. We try to study the electronic agent in a consumer decision process perspective and to examine the different sort of agents depending on their relationships with vendors and consumers. Our final aim is to understand the role of electronic agent on consumer satisfaction. For that purpose, we conducted a little empirical study which consist in presenting two types of agents to consumers: a good one and a bad one and to evaluate the level of consumer satisfaction.

Key Words: Electronic agents, consumer behavior, satisfaction, e-commerce.

Introduction

 « The role of the intelligent agent is to assist you. At the edge of information, it signifies that the agent should help you to find information», Bill Gates (2000).

Internet is the 4th commercial revolution after the stores, the megastores and the self-services (Volle, 2000). Whereas, the online sells are lower than expected. The principal reasons advanced by practitioners and numbers of researchers are linked with problems of trust and confidential datas. We argue, with Bakos (1997) and Ariely (2000), that the problem is somewhere else, more linked with the consumer information management. On the Internet, all the information is available as in a pure and perfect market (Desmet, 2000). And this profusion of information is the center of the problem. Consumers are unable to deal with all the available information because their cognitive capacities are limited (Simon, 1978). A solution to this problem is the utilization of electronic agents that deal with the information instead of the consumers within their decision process (Paraschiv, 2002). Our purpose is to present the electronic agent and its different applications (I), then to study the possible impact of electronic agent on consumer satisfaction on the Internet in order to justify the presence of those types of agent on web sites (II).

I. What can do an electronic agent?

We decided to present the electronic agent with an example of its capabilities for the consumer. Alba and al. (1997) inspire this example. It will lead us to present the different functions of electronic agents for the consumer.

I.1. An example of electronic agent….

Jenn had to go to a wedding but she has nothing to wear. Will she go shopping outside?

Jenn is hesitating because she knows that shopping represents a big time investment. Furthermore, she doesn't know exactly what she wants so it's hard to know where to search. She's alone, nobody wants to do some shopping with her, so she's afraid not to choose the good clothes or to come back home with nothing as it's usually the case. She doesn't trust the vendors because they often give her bad advises in the past.

*NO, it's decided, Jenn is going to call her personal advisor, the one who guides all her buying, who knows her better than herself, who reacts to all her desires, who never takes too much time for nothing, in whom she can trust...**her electronic agent**. Jenn turns on her computer and activates her personal electronic agent, named MINI-ME.*

MINI-ME appears on the screen, it takes the appearance of a virtual female vendor. The discussion begins:

MINI-ME: Hi Jenn, What do you need today? Are you in the mood for shopping or do you want something specific?

Jenn: I have an evening wedding and I need something to wear.

MINI-ME: All right, it's an evening wedding, the dressing has to be elegant. White is forbidden. Do you want a dress or some trousers? From what I know of your actual clothes, I suggest that you choose some trousers with the matching vest?

Jenn: All right, here we go for some trousers and an elegant vest. It will fit but I prefer dark colors.

MINI-ME: How much do you want to spend?

Jenn: Between 150 and 300 Euros

MINI-ME: OK, let me search ...413 models could correspond to your desires.

Jenn: Let select the 10 best options

10 photos of Jenn are appearing on the screen, each one wears a different suit, each photo is followed by the price, the brand, the store and the rating given by MINI-ME based on the preferences of Jenn. The preferences are actualized by Jenn's previous buying and the parameters she has entered when she first decided to use a personal electronic agent. Jenn choose a picture of herself in one suit, the pictures gets bigger and makes a 360° rotation. Jenn can also, if she wants, consult the washing instructions, the fabric composition...After doing all this for the 10 suits, she chooses her favorite one. MINI-ME knows Jenn size so it picks up the correct size without asking her.

MINI-ME: How do you want to pay?

Jenn: By credit card.

MINI-ME: The store Y which sells the suit (the store Y has been chosen by MINI-ME considering the price, the services provided and its trust ratio) are proposing a shirt to fit with your suit.

The shirt appears on screen and Jenn decides to buy it.

MINI-ME: Juts to notice you haven't bought any moisturizing cream since 3 months. Do you need some? The store X is actually making a discount on your favorite one.

Jenn: All right, let's go for a cream...

I.2. What did the agent exactly do?

In that short example, the electronic agent MINI-ME has performed all the stages of Jenn's decision process instead of her. Jenn's attitude toward the product has been totally induced by the electronic agent.

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We have studied this example under the prism of the Fishbein (1967) compensatory model of attitude formation, which mainly consists in the following form:

$A_i = \sum_j w_j . X_{ij}$ with

A_i: consumer attitude toward product i

w_j: importance of attribute j

j: an attribute of product j

X_{ij}: information's available on attribute j of product i.

In the example, the agent has an influence on every stage of the consumer attitude formation toward the product:

- When Jenn tells her agent what she needs in a very imprecise way (some clothes for an evening wedding), she doesn't know which are the alternatives corresponding to her problem definition. Her agent allows her to build her preferences by proposing her different alternatives (dress or trousers). Even then, the agent always takes into account external factors: a wedding means no white dress for the female guests, an evening wedding means a quite fancy dressing. Without the electronic agent, the former equation wouldn't exist. At a former level, the agent has an influence on the attitude formation toward the product by presenting the product, as shown in the following figure (figure 1).

Insert figure 1 here

- Once the problem identified the agent searches for available informations on the different possible products corresponding to the consumer needs. It performs a quite laborious task instead of the consumer himself. It helps determining the X_{ij} as shown in figure 2.

Insert figure 2 here

- By analyzing the problem and defining the type of products corresponding to Jenn's needs, MINIM-ME has also determined which were the different attributes of the seeking product (trousers, dark colors…). Thus, it has a determining influence on j (figure 3). The agent is an expert whereas the consumer is not, principally because the individual isn't always interested in the product choice.

Insert figure 3 here

- By choosing the most important attributes for the consumer depending on his precedent buying and on his declared preferences, the agent determines the w_j (figure 4). Instead of the consumer, it evaluates the different alternatives by rating them.

Insert figure 4 here

- Finally, the agent buys the product and negotiates the price with the distributor. It has an important influence on a variable not taken into account in the former equation but which can be added: informations on exogenous product attributes X^k_{ij}, where k represents the agent role. Information is not absolute, it depends on an external intervention: k (figure 5).

Insert figure 5 here

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- At the end of the interaction between Jenn and her agent, it proposes her products that she's never asked for at the moment. These proposing are resulting from a dialogue with the distributor (the shirt) or are spontaneously coming from the agent (the moisturizing cream). In both cases, the agent plays the advisor and the preceptor of the buying. It creates the need.

It is possible to appreciate the huge commercial potential of such an electronic agent: by facilitating the process, it leads the consumer to buy online but it also creates the need by its constant interaction with the consumer. The agent realizes a vendor work and becomes a key element of relationship marketing.

I.3. Different types of agents

Whereas this example may seem a little futuristic, the reality isn't so far from it. The example implies that the consumer owns a smart electronic agent, which could be a software linked to his hard drive and programmed by him to correspond to his needs. Others types of agents exists, which are not owned by the consumer or linked to his hard drive: agents owned by the distributors or independent agents owned by independent companies ("Fido the Shopping Doggie, http: //www.Shopfido.com or "Bargain-Finder" d'Andersen Consulting, http: //bf.csstar.ac.com/bf). Now our days, a great number of electronic agents exist for the consumers or for the vendors. A lot of web sites are proposing independent information search agents which are choosing the information on sites opened to them. Let's take some French examples.

The "Galeries Lafayette" are proposing a virtual clothing advisor in which you can enter a picture of you, your size, your hair and skin color…The advisor is creating you a new dressing style, it also gives you make-up and hair style advises.

More complete, Personnalogic is an independent agent that you can find on the web and that gives advises on all sort of products: animals, travels, cars…It gives products a rate depending on your answers to some questions it has formerly asked in order to reveal your consumer profile. If you already know the product that fits with your needs, Personnalogic can establish attributes comparison matrix between different brands.

This research manly deals with commercial electronic agent but all the existing electronic agents (medical agent…) are based on the same theoretic and technical foundations: they represent a palliatives to human limited cognitive capabilities. They are also, comparing to usual software, personalized, proactive and adaptive (Maes, Guttman et Moukas, 1998). Maes (1995) defines the electronic agent as a computer program who knows consumer's preferences and can act autonomously for them. Those systems imply the consumer engagement in an interactive process: information sharing, agreement for the agent to accomplish task instead of the consumer, respecting his preferences and constant improvement of the system. According to Maes (1995), different types of electronic agents exist not necessarily used for business: agents that organize the e-mails, the news, the movies… The common point between all these applications is the utilization more or less complex of the artificial intelligence. Agents can be pre-programmed by the user or by their designer. They also can use collaborative filtering which recommend action by examining passed actions of others users. This system implies a strong collaboration between different sort of agents (Maes, 1995). There is a difference between simple agents who are searching and presenting information to the consumer and smart agents that make recommendations

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depending on the consumers preferences and needs. It is possible to represent the relations between the electronic agent, the vendor and the consumer (figure 6).

Insert figure 6 here

We focus here on supply agent whereas demand agents also exist. Demand agents are agents used by companies to identify consumers and their profile. Richard (2000) defines demand agents as agents that analyze the global demand in order to adapt their offer to market needs. Those agents are a foundation to electronic relationship marketing. They are created to rebuild the relation between the vendor and the consumer but in that case a virtual one replaces the vendor. (Richard, 2000). Those agents allow:
-   The recording of consumer's profiles and preferences in order to personalize the web sites.
-   The recording of consumer's successive demands.
-   Some recommendations upon commercial supply evolution.

The benefit of using agent is double: the consumer can reach an offer more adapted to his needs, the vendor can better know his client and be more reactive to his changing needs. Now that we have described the different sort of agent and their function for the consumer, we're going to present an empirical study where we try to evaluate the impact of electronic agent on consumer satisfaction.

II. Electronic agent and its impact on consumer satisfaction: an empirical study.

Our purpose is to understand the impact of electronic agent on consumer satisfaction. If agents are supposed to represent the future of electronic commerce, it's because they might have a positive impact on consumer satisfaction. Maes, Moukas and Guttman (1998) argue that electronic agents may be used at all stages of consumer buying behavior: information search, alternative evaluation, negotiation, buying decision and post-buying evaluation. West and al. (1998) add that electronic agent can be useful in all the consumer decision process and not just only his buying process. They identify different types of agent considering the stage of the decision process they act on (table 1).
The empirical study we've conducted deals with information search and alternative evaluation agents such as Personnalogic.

Insert table 1 here

II.1. The theoretical impact of electronic agent on consumer satisfaction

In order to apprehend the impact of electronic agents on consumer satisfaction, we are studying the different variables that may have an impact on the perception of the quality of an agent by consumer.

Aksoy (1999) and Urban, Sultan and Qualls (1999) argue that the consumer satisfaction raise with the perceived quality of an electronic agent. The perceived quality of an agent is a key mediator to consumer satisfaction. We propose the first hypothesis:

H1: The perceived quality of an electronic agent has a positive impact on consumer satisfaction toward this agent.

Some studies deal with the impact of electronic agent on consumer satisfaction (Aksoy, 1999; Moon, 2000). They have showed that the use of electronic agents raises the consumer satisfaction. Aksoy (1999) argues that the consumer perceive the agent as a good one and so is satisfied if the agent acts in the same way that he would have act. She introduces the concept of perceived congruency between the agent decision process and the consumer one. We had previously conducted a qualitative study on consumer perception of electronic agents and had showed that the concept of congruency wasn't used by respondent (Wallet-Wodka, 2002). In this study, we formulate the hypothesis that the perceived congruency of the electronic agent hasn't any significant impact on perceived agent quality.

H2: The perceived congruency of the electronic agent hasn't any significant impact on perceived agent quality.

Hoque and Lohse (1999) and Häubl and Trift (2000) argue that the impact of electronic agent on consumer satisfaction depend on its configuration. An agent is perceived as good or bad depending on his characteristics. For the authors, an electronic agent can articulate the information it provides to the consumer in a complex way or not. The determinant of complexity are the presentation of the information (listed or not), the presence of pop-ups, the degree of details provided on each alternatives and the number of pages before the command. We argue that the complexity of the agent had a negative impact on perceived agent quality.

H3: Perceived complexity of an electronic agent has a negative impact on perceived agent quality.

Urban, Sultan and Qualls (1999) and Brynjolfsson and Smith (2000) identify the impact of trust on electronic agent utilization by consumers. Cases (2001) identify different element that permit reducing the perceived risk on web site. The risk has three main dimensions (Mitchell, 2001): financial, technical and physical. Within these dimensions, different elements can determine the perceived trust of buying electronic agents:
- Presence of insurance's and payment security
- Data's confidentiality
- Free phone number

In the following study, we argue that risky electronic agents lead to less perceived quality.

H4: Perceived risk of an electronic agent has a negative impact on perceived agent quality.

At least, we introduce the concept of adequacy to demand as an essential antecedent of perceived agent quality. If the agent gives a good answer to the consumer demand, the agent will be perceived as good and the consumer will be more satisfied (Wallet-Wodka, 2002). The quality depends on the adequacy between the answer and the demand.

H5: Adequate answers to consumer demands have a positive impact on perceived agent quality.

It is possible to represent those hypotheses within a figure (figure 7).

Insert figure 7 here

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II.2. Research methodology

In order to test the four hypotheses presented above, we've decided to conduct an experimentation. We choose to build two electronic agents corresponding to the three last variables:
- A good agent: not complex, not risky and giving adequate respond to consumer needs.
- A poor agent: complex, risky and giving inadequate respond to consumer needs.

The congruency can not be manipulated "a priori". We've measured it "a posteriori" without manipulating it. The purpose of the manipulation is to create variance in the different antecedents of the perceived quality. We've conducted t-test between the two agents in order to test the first hypothesis. The others hypotheses are tested by simple regressions.

We've created two electronic agents specialized on travels. For that purpose, we used Dreamweaver 4. The two agents are totally similar except for the complexity, the risk and the quality has showed in table 2.

Insert table 2 here

We've decided to choose travels because it's a quite funny product for the respondent but it is also difficult to command a travel alone without passing by an intermediary such as a travel agency or a travel web-site. Furthermore, a lot of existing electronic agents are recommending travels on the Internet. Referring to the figure 5, we created a simple independent agent.

We measured the perceived risk, the perceived complexity, the perceived congruency and the perceived quality as well as consumer satisfaction with measurement scales presented in annex 1.

The experimentation has been done on French University students. 61 students have been placed in front of one of the agent. We gave them a scenario to guide their search. The search consisted in finding a trip to Cuba, for two, in December, in order to get some rest, not visiting. The budget was near 1300 Euros per persona. The respondents were given a few moment to search the adequate product. Then they had to answer a questionnaire.

II.3. Main results and implications

30 students were showed the good site and 30 students were showed the poor one.

Before testing our main hypothesis, we have tested the quality of the manipulation with t-test. We've compared the mean of perceived complexity, perceived risk and perceived adequacy within the two agents. The aim was that the good agent receives higher mean of adequacy, lower mean of risk and lower mean of complexity. All the means were going in that sense and all the results were significant which means that the manipulation is correct (annex 2). Further more, for the multi-items scales (more than 2: satisfaction, complexity, risk), we conducted factorial analysis and validity analysis. All the measurement scales appears to be satisfying (annex 1).

We began with the first hypothesis, H1*: The perceived quality of an electronic agent has a positive impact on consumer satisfaction toward this agent.*

To test that hypothesis, we made a t-test between the good agent and the poor agent one the consumer satisfaction score (the consumer satisfaction is measured by a three-item scale). It appears that for the good agent, the satisfaction score is higher (15,85) than for the poor agent (12,82) and the result is significant (table 3).

Insert table 3 here

The first hypothesis is validated. We can argue that the quality of an electronic agent as a major impact on the consumer satisfaction.

The second hypothesis deals with the link between perceived congruency and perceived quality (*H2: The perceived congruency of the electronic agent hasn't any significant impact on perceived agent quality*). The aim was to reject the link because the exploratory study didn't show the presence of perceived congruency in the respondent speech. We conducted a simple regression between perceived congruency (in two items) and perceived quality of the agent (in one item) (table 4). The results aren't significant which leads us to accept the second hypothesis.

Insert table 4 here

As we have previously argued, the congruency doesn't have any significant impact on the perceived quality of the agent whereas the impact is positive as argued by researchers.

The third hypothesis deals with the complexity, H3*: Perceived complexity of an electronic agent has a negative impact on perceived agent quality.* We tested the hypothesis with a simple regression between perceived complexity and perceived quality. The results aren't significant which means that the impact of complexity on perceived quality isn't clear (table 5). This result is quite interesting. In fact, it is possible to say that for some people, the complexity can have a positive impact on perceived quality (the sign of the adjusted R-square goes in that sense). A complex agent can be seen as a serious one. The third hypothesis is not validated.

Insert table 5 here

The fourth hypothesis was about the impact of risk on perceived quality *(H4: Perceived risk of an electronic agent has a negative impact on perceived agent)*. The risk associated with electronic agent is important in literature. The result of a simple regression between risk and quality shows that the impact is actually positive (table 6). It is significant at a level of 10%. We can not validate the fourth hypothesis because of the poor level of signification but it is possible to argue that, we've a bigger sample, the relation would be significant.

Insert table 6 here

At least, the fifth hypothesis (*H5: Adequate answers to consumer demands have a positive impact on perceived agent quality*) is validated (table 7). It is not a surprise. It's logical that the quality of the agent answer has a positive impact on perceived quality.

Insert table 7 here

Our aim was to study the impact of electronic agent on consumer satisfaction in order to understand their role in electronic commerce. Aksoy (1999), Urban, Sultan and Qualls (1999) and Haubl and Trift (2001) argue that the perceived quality of the electronic agent was the main determinant of consumer satisfaction as in the basic models of consumer behavior (such as in Howard's, 1994). The first hypothesis of our empirical study validates this affirmation. We pointed out in the literature that the perceived quality of an electronic agent has some antecedents such as complexity, risk, adequacy and perceived congruency, whereas the impact of the last one wasn't significant for us, regarding a previous exploratory study. The experimentation shows that adequacy (positive impact) and risk (negative impact) had an impact on perceived quality whereas congruency hadn't. The impact of complexity is more complicated to evaluate because it could be different that what we first believed (finally positive but not significant).

Those results lead to some useful implications for electronic agent designers. Designers should be aware of the level of security they put on an electronic agent. The question of adequacy is very important also but it's the heart of an agent, so it is common sense to say that designer should be aware of creating agents that respond correctly to consumer's needs. The question of complexity leads us to broad the debate and to introduce individual variables such as surfer expertise that could moderate the impact of complexity on perceived quality. Nonetheless, the study has succeeded in proving the link between the quality of an agent and the consumer satisfaction.

Conclusion

To conclude, it will be interesting to conduct that study on different respondents and to take into account some moderators such as surfer expertise or self-confidence. Furthermore, an experimentation with two agents and a situation without agent but just a usual shopbot should be edifying to understand more deeply the impact of agent on consumer satisfaction.

What can be pointed out from the literature on electronic buying agent, such as defined in this paper, is the huge potential of that new distributive formula. The agent acts as if it was the consumer and improves the efficiency of his decision process; furthermore it also raises his satisfaction level. This improvement could lead to more buying intentions and could be the solution to the deceiving results of e-commerce.

Whereas, those encouraging results doesn't really fit with the reality. As a matter of fact, most of the existing agents are disappearing from the web for economic reasons. People doesn't enough agree to pay to use them. Maybe agents doesn't have such an impact on consumer satisfaction if the consumers refuse to pay to use them even after having tried them or maybe, the financial aspect is not congruent with the image of electronic agents as free advisors, helping the community of Internet users?

List of figures

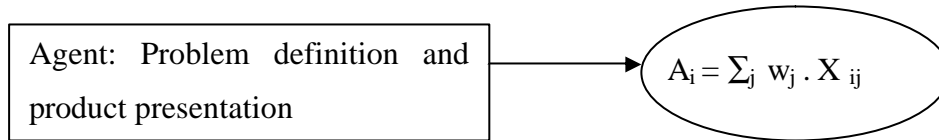**Figure 1. The role of agent on product attributes formation**

Agent: Problem definition and product presentation $\longrightarrow$ $A_i = \sum_j w_j . X_{ij}$

Figure 2. The role of agent on information search

$A_i = \sum_j w_j . \left(X_{ij}\right)$ $\longleftarrow$ Agent: Information search on the products
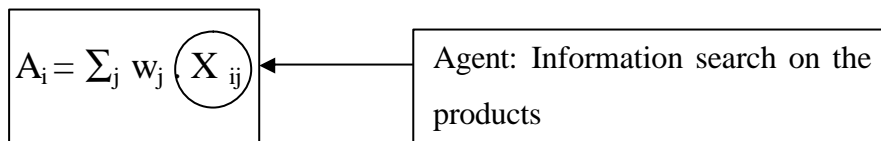
Figure 3. The role of agent on product evaluation

$A_i = \left(\sum_j\right) w_j . X_{ij}$

$\uparrow$

Agent: Product expert
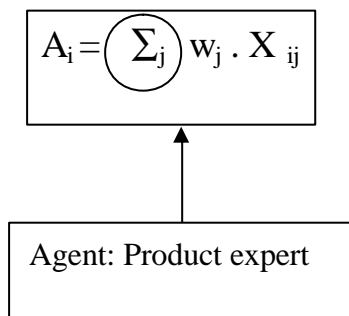
Figure 4. The role of agent on alternatives evaluation

$A_i = \sum_j \left(w_j\right) . X_{ij}$

$\uparrow$

Agent: Alternatives evaluator
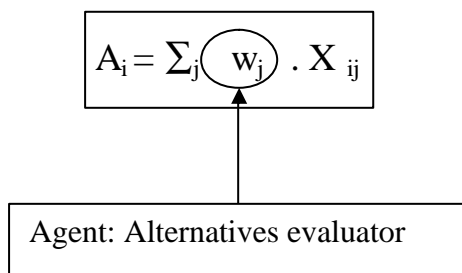
Figure 5. The negotiating role of the agent

$A_i = \sum_j w_j . X_{ij} \left(X^k_{ij}\right)$ $\longleftarrow$ Agent: Negotiates the distributors and buy the product
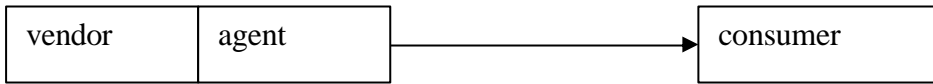
Figure 6. Relationships between agents, vendors and consumers.

- Simple independent agent: the interactivity exists only between the vendor and the agent in order to provide information to the consumer.

| vendor | ⇄ | agent | → | consumer |
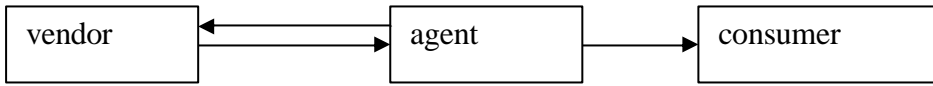
- Simple dependent agent :

| vendor | agent | → | consumer |

- Smart independent agent: interactivity vendor-agent an agent-consumer

| vendor | ← agent → | ← | consumer |

- Smart web site dependent agent:

| vendor | agent | ⇄ | consumer |
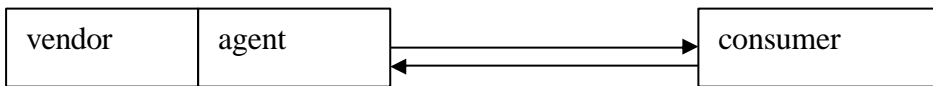
- Smart consumer and web site dependent agent: interactivity agents-agents.

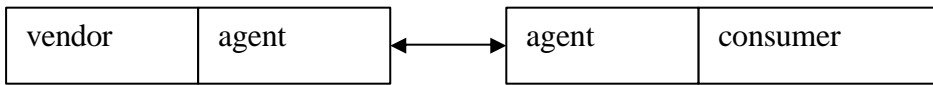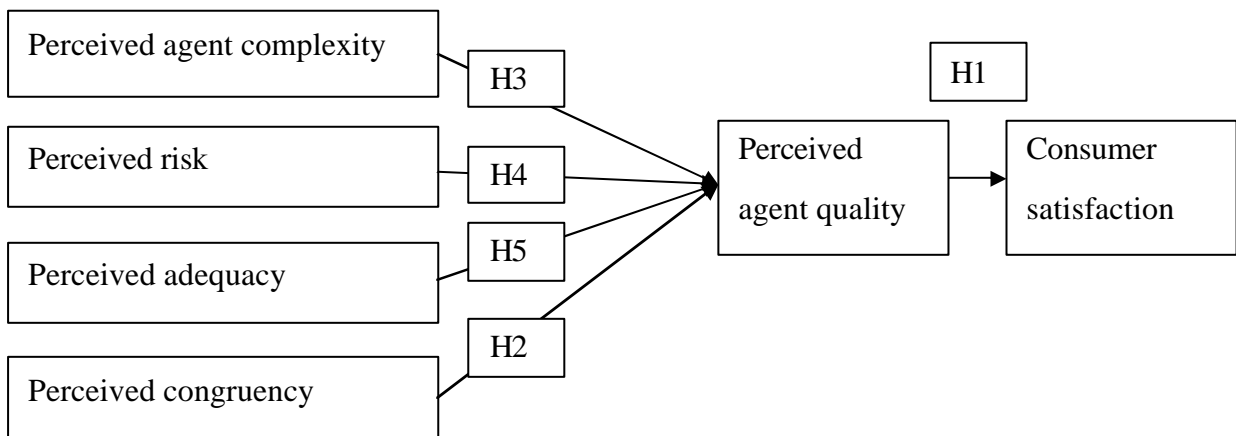| vendor | agent | ↔ | agent | consumer |

Figure 7. Conceptual framework and research hypothesis

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List of tables

Table 1. Different types of electronic agent and their function within the cyber-consumer decision process (inspired by West et al., 1998).

Cyber-consumer decision process	Electronic agent
Problem definition and preferences construction	« Tutor »: educates the consumer et allows him to discover his preferences ex: Moviecritics
Information search	« Clerk »: accomplishes fastidious search, classification and sorting information tasks ex: Personnalogic, Bargainfinder
Alternatives evaluation	« Advisor »: gives an experts opinion and advise the consumer considering his predefined tastes ex: Personnalogic
Decision	No existing agent
Buying	« Banker »: negotiates and facilitates the buying ex: T@T from MIT

Table 2. Design of the two electronic agents

	Good agent		Poor agent
Not complex	- Listed presentation of the information - No pop-ups - Lot of details on each alternatives - Few pages before the command	**Complex**	- Non listed presentation of the information - Many pop-ups - Few details on each alternatives - Many pages before the command
Not risky	- Presence of insurance's and payment security - Data's confidentiality - Free phone number	**Risky**	- No insurance's nor payment security - No data's confidentiality - No free phone number
Adequacy	- Adequate answer with the demand - Rated alternatives	**Poor adequacy**	- Inadequate answer with the demand - Non rated alternatives

Table 3. T-test for the first hypothesis

	QUALITY	N	Mean	Standard deviation	Mean standard error
SCORE satisfaction	Good	31	15,8571	2,99028	,56511
	Poor	30	12,8276	2,98890	,55502

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			F	Sig.	t	ddl	Sig. (bilateral)
Test of Levene on variance equality					**Test-t for mean equality**		
SCORE satisfaction	Hypothesis of equal variances		,579	,450	3,825	55	,000
	Hypothesis of non equal variances				3,825	54,928	,000

Table 4. Test of H2

Model	R	R-two	Ajusted R-squared	Standard estimation error	Changes in the statistics				
					Variation of the R-two	Variation of F	ddl 1	ddl 2	Modification of F signification
1	,302	,091	,076	1,43832	,091	5,931	1	60	,018

a. Predictable values: (constants), perceived congruency

b. Dependent variables: perceived quality

Table 5. Test of H3

Model	R	R-two	Adjusted R-squared	Standard estimation error	Changes in the statistics				
					Variation of the R-two	Variation of F	ddl 1	ddl 2	Modification of F signification
1	,051	,003	-0,016	18,33108	,003	,143	1	60	,706

a. Predictable values: (constants), perceived complexity

b. Dependent variables: perceived quality

Table 6. Test of H4

Model	R	R-two	Adjusted R-squared	Standard estimation error	Changes in the statistics				
					Variation of the R-two	Variation of F	ddl 1	ddl 2	Modification of F signification
1	,338	,114	,99	1,422026	,114	7,594	1	60	,008

a. Predictable values: (constants), perceived risk

b. Dependent variables: perceived quality

Table 7. Test of H5

Model	R	R-two	Adjusted R-squared	Standard estimation error	Changes in the statistics				
					Variation of the R-two	Variation of F	ddl 1	ddl 2	Modification of F signification
1	,684	,468	,459	1,10067	,468	51,879	1	60	,000

a. Predictable values: (constants), perceived adequacy

b. Dependent variables: perceived quality

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Annex 1. Measurement scales (those scales were actually in French, we're presenting here a translation)

Each scale is measured in seven points on a Likert scale such as the following one:

← Totally disagree						Totally agree →
1	**2**	**3**	**4**	**5**	**6**	**7**

We're presenting here the analysis of the more than two-item scales.

Perceived congruency:

This agent acts as I do when I want to buy a trip

This agent takes the same decision as I would have taken by myself considering the trip I want to buy

Perceived complexity (by Cheung, Chang and Lai, 2001):

Working with this agent is complicated, it is difficult to understand what's going on

Using this agent involves too much time doing mechanical operations (i.e.: data input)

It takes too long to learn how to use this agent to make it worth the effort

Scale	**Items**	**Cronbach Alpha Without the item Global a: 0,83**	**% of explained variance**	**Extraction**	**Component 1**
Perceived complexity	C1	0,8105		0,664	0,815
	C2	0,7523	69,67%	0,800	0,895
	C3	0,7898		0,750	0,866

Perceived risk (6 dimensions by Cases, 2001):

Risk dimensions	**Items**	**Mean Scores**
Performance risk	The quality of the found trip by the agent could be lower than my former expectancies	4,22
Financial Risk	The entire price spent for the trip found by the agent could be higher than anticipated	4,65
Temporal risk	Buying a trip found by the agent could be a lost of time	4,78
Social risk	Using an electronic agent to buy a trip could put me in disagreement with my friends and relatives	2,19
Payment risk	Paying a trip by the intermediary of the agent could have negative consequences	4,22

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Private risk	The personal data I'm giving to the agent could be used by others web sites	4,49

We didn't run any factorial analysis here because each item represents a well-defined dimension and our aim isn't to regroup the information on fewer dimensions.

Perceived adequacy:

This agent successfully answers to my request considering the trip I was looking for

Perceived quality:

I find that the quality of this agent is good considering what I was looking for

Satisfaction:

Globally, this agent satisfies me

It leaves me a good impression

I would recommend this agent to a friend

Scale	Items	Cronbach Alpha Without the item Global a: 0,83	% of explained variance	Extraction	Component 1
Satisfaction	S1 S2 S3	0,89	83,4%	0,881 0,850 0,771	0,939 0,922 0,878

Annex 2. Quality of the manipulation

Each t-test presents significant results at the level of 1%.

Manipulation of the complexity

Complexity	Sample	Perceived complexity mean	Standard deviation	Mean standard error
High (poor site)	30	2,4483	0,80117	0,14877
Low (good site)	31	2,0571	0,51021	0,09642

Manipulation of the risk

Risk	Sample	Perceived risk mean	Standard deviation	Mean standard error
High (poor site)	30	4,39	0,7416	0,1236
Low (good site)	31	3,63	°,5563	0,1112

Manipulation of the adequacy

Adequacy	Sample	Perceived adequacy mean	Standard deviation	Mean standard error
High (good site)	31	4,8355	0,6739	0,1273
Low (good site)	30	3,9811	0,836	0,1529

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