Warranty as a Factor for E-commerce Success

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Abstract

Two groups of factors impact the success of e-commerce transaction: environmental factors and content of the messages exchanged between the seller and the buyer. The first group includes factors describing the environment in which the seller-buyer relationship operates, such as IT infrastructure, Logistic Infrastructure, Financial Infrastructure, and Government regulations. Second group -- content of the message -- covers these elements of the message, which improve the trust between the two parties (especially the buyer's trust). Among them, the statement about warranty plays critical role as the risk reducing information send by the seller. The two aspects of warranty message are considered: malfunctioning (the product does not operate as it is expected by the seller) and misinforming (the product does not operate as it is expected by the buyer).

Keywords: e-commerce, warranty, risk, misinforming, malfunctioning

Introduction

Two groups of factors impact the success of e-commerce transaction: environmental factors and content of the messages, exchanged between the seller and the buyer. The first group includes factors describing the environment in which the seller-buyer relationship operates, such as IT infrastructure, Logistic Infrastructure, Financial Infrastructure, and Government regulations. Second group -- content of the message -- covers these elements of the message, which improve the trust between the two parties (especially the buyer's trust).

The research limits its consideration on the role of warranty, as risk reducing information of the message send by the seller.

Warranty is a form of distributing (sharing) the risk (of low quality) among all of the customers. In a single transaction, warranty may be considered as providing information, which shares the risk in either of the parties in seller-buyer relationship. In this paper we will try to explore the role of warranty on the case of simple business transaction, performed via Internet. The two kinds of risks - malfunctioning and misinforming - are considered. The paper discusses the relationship between seller and buyer in an e-commerce transaction to assess the impact of warranty message in improving the trust between the two parties.

A Typical Case

Let us consider the case of selling personal computers. Our research on the way how computers are offered via Internet based e-commerce sites, shows the following typical picture:

Paper Accepted as a Short Paper

Information usually provided by Seller	Information the Buyer normally looks for
Pentium IV/1.6C GHz Intel 440 - LX Power Pro ATX 256MB DDR RAM 1.44 MB FDD 30GB HDD QUANTUM 16MB SGRAM VGA card AGP 15'' Color HANSOL 0.28, LR N.I. (1024x768), CPU CONTROL	Something to allow me to: • develop and edit text • make even sophisticated computations • use of e-mail • easy access to Internet • organize a personal data • play games • watch movies

Warranty message usually addresses only malfunctioning, and buyers' decision is really difficult under "click-and-buy" circumstances.

Three years warranty if it fails!

To decide the buyer must learn:

1. What means ATX, AGP, etc.?
2. Whether the offered system can fit to his needs (software)?
3. Whether s/he needs all and every of the components?

If the warranty message addresses misinformation it is more likely that the deal will take place.

Three months probation period:
Money back if you are not satisfied

Let me try!

There is no risk that I will hold an unusable monument for three or more years.

Discussion

In any business transaction, but especially in indirect communication, as in e-commerce, at least two sources of risk and two types of claims can be observed:

1. Risk of malfunctioning: the product sold does not meet the specified (promised by the seller) properties, during the specified period of its life.
2. Risk of misinforming (misunderstanding): the product does not meet the expectations of the buyer (as s/he understands the promises). Warranty statements as "If you are not fully satisfied - money back" addresses this kind of risk.

In the seller-buyer contract, the purpose of warranty statement is to reduce the risk for both parties:

Buyers

The buyer's problem is to make a purchase decision - to evaluate whether the product will satisfy his/her needs for its length of service. Warranty, as a part of the message, can reduce the risk of the decision made by the buyer in the both cases:

1. Malfunctioning. The first type of warranty ensures that some aspects (financial, technical) of the low quality of the product will be covered by the seller, and the buyer risk is limited to some inconvenience, but also (and more important for the phase of decision making) is that high level of warranty means low probability for malfunctioning and consequently low probability for inconvenience.
2. Misinforming. Second type of warranty reduces the risk of dissatisfaction, based on misunderstanding and uncertainty, and encourages buyer to buy.

Sellers

The seller's problem is to define a strategy to distribute the risk among all of the customers in a way to preserve profitability.

1. Malfunctioning. Unperfected production is entirely internal problem for the producer and respectively – the seller. The producer can apply any instrument to evaluate the risk as precisely as possible. The seller's risk is in the difference between the real and the estimated quality. Deviation in both directions has negative impact to the seller: if real quality is higher than the evaluated one – the warranty statement will be weaker, in other case – the seller's profit will be lower than expected.
2. Misinforming. The risk of unperfected communication between seller and buyer is a property of the seller-buyer system and the relationship between its elements. Precise assessment of this risk is critical for the success in e-commerce.

The first kind of warranty is based on the property of the product and it could be uniform – every customer receives the same message. The second kind of warranty requires better focusing on the particular target group.

Experiment

Target group

A group of sixty students – the Spring 2003 class of Management Information Systems - was used as target group of customers. They were offered to purchase a personal computer. Students are mostly freshmen or sophomore, and this was their first IT course. We assumed that these students really face decision for purchasing personal computer and have an established understanding about their needs and the purpose of using it. Also they lack professional knowledge about terminology used in current information technology.

Offer

A stand alone computer system, with powerful computational capabilities, designed to serve a professional scientist, was selected. The system lack entirely communication devices, and allows limited multimedia (pour sound, no color graphics). The system allows word processing, and complex computation, but does not allows use of Internet, e-mails, playing games, etc. The price was realistic, but highly attractive.

ASUS A7V333/RA sA, VIA KT333,266,ATA 133,RAID, 3DDR,AGP 4x, USB 2.0, IEE 1394, ATX

AMD XP PALOMINO 2100PR/1.75 GHz

DDRAM 512 MB DDR, PC 333MHz, SAMSUNG

80 GB MAXSTOR / 7200 / ATA 133/2MB

PCI ATI 1MB

17'' SAMSUNG 753S 1280x1024/65Hz 1024x768/85 Hz BW

keyboard, mouse, midi tower case

Procedure

Students were asked to evaluate whether the given system will satisfy their needs for: word processing, complex computations, management of personal data (tasks, contacts, etc.), Internet, e-mail, games, music, and movies. Students have to specify two parameters for every application: their needs (in percentages), and whether the particular system meets their expectations. Further, they were offer warranty statement "Three years warranty" and they were asked to make purchase decision (yes/no). The third step offer one month probation warranty, and again they were asked to make purchase decision.

Results

Thirty five out of 60 approached students had responded. Tables 1 and 2 contain the details of the received answers.

Where ***f(b, a)*** is ***(1.0 - a)*** if ***b*** is YES, and ***a*** if ***b*** is NO. (When the system allows use of the application - the misinformation is the compliment of ***a*** to ***1.0***, in the opposite case – the misinformation is measured with ***a***. The assessed ability is interpreted as probability that this PC will satisfy the formulated needs.)

Application	**Needs (*n*) %**	**Assessed ability of the system (*a*) %**	**The system allows (*b*)**	**Risk of wrong decision (*r = f(b,a)*)%**
Word Processing	100	100	YES	0
Computation	30	70	YES	30%
e-mail	100	80	NO	80%
Internet	100	70	NO	70%
Personal data	90	80	YES	20%
Games	70	80	NO	80%
Movies	10	50	NO	50%

Table 1. Summary of answers

"Three years warranty"	75% of students answered "yes".
"One month probation"	95% of students answered "yes".

Table 2. Positive decisions

The overall risk of misinformation may be evaluated as a weighted average, where "needs" serve as weights or, in other words, the total probability of misinformation ($n_i/\Sigma n_j$ is probability of the need i, $i=1,..,7$, and r_i is probability of wrong decision related to a particular application) :

$$R = \frac{1}{\sum n_i} \sum n_i r_i$$

or Risk of misinformation may be evaluated as (9 + 80 + 70 + 18 + 56 + 5) / 590 and it is about 40%.

Conclusion

The paper raises discussion on the problems of making purchase decisions under uncertainty:

1. How customers evaluate risk of misinformation?
2. What is their acceptable level of risk and how the seller may assess it?
3. What is the role of warranty statement in reducing this risk?

These problems are important for every kind of business transactions, but they are critical for transactions performed indirectly, especially via Internet.

The problem and one possible way of evaluating the risk of misinformation is illustrated with a simple experiment. The experiment shows that the risk of misunderstanding could be high enough and deserves special techniques for evaluation and distribution.

Biographies

Dimitar Christozov has more than 20 years of experience in a cross-section of areas such as computer science, quality management and information systems. He graduated in Mathematics in 1979 from Sofia University "St. Kliment Ohridski". In 1986 he completed his doctoral thesis "Computer aided evaluation of machines' reliability". Since 1993, Dr. Christozov joins the American University in Bulgaria as a Professor of Computer Science. Additionally he was engaged in design and implementation of the IT stream of courses and MIS MBA at the Faculty of Economics and Business Administration of the Sofia University. Professor Christozov has published 3 separate volumes, 26 papers in refereed journals and proceedings, more than 50 presentations at conferences, seminars, and colloquiums.

Plamen Mateev is graduated in Mathematical Statistics from Sofia University "St.Kl.Ohrideski" in 1971. His doctoral thesis on information theory approach to experimental design was completted in Moskaw State University "M.B.Lomonosov". He has near 25 years of experience in teaching and consulting in the fields of application of statistical methods in different areas as medicine, technology, risk assessment and statistical software. He has more than 63 papers in scientific journals and proccedings of conference. Dr. Mateev is Head of Department "Telecommunications" at Institute of Mathematics and Informatics. Currently he is elected as a Vice-President of Bulgarian Statistical Society.