TRUST-A VITAL CONSTITUENT FOR SECURITY IN E-BUSINESS

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ABSTRACT

For every relationship, especially in business, to be successful, an inherent characteristic that must be present is trust. It becomes more of a psychological requirement as the bond involves people, directly or indirectly. In an ideal situation where apiece is in place, and the human beings involved are completely satisfied in all ways, the concept of trust seems to become diluted. Hence, we can infer that trust is a requisite in any relation where there is a fear of deception and reveals its utmost importance in an e-Business environment. Trust is one of the bastions of both traditional and electronic business. The level of faith achieved can be satisfactory in case of traditional businesses as it has direct involvement of business parties (who are again people). But when it comes to electronic business it is the machines that speak to each other on behalf of its users and thus, the need to manage and implement trust in a business transaction to make sure that the customers feel secure. In the paper, we realize the necessity of trust in the e-Business environment and also its close association with security.

Index Terms— E-Business, Trust, Security, Transactions.

1. INTRODUCTION

The advent of Internet has urged the need for trust in e-Business. It is one of the most imperative security issues biased more towards the legal and the business perspective rather than the technical side. In a real world scenario, trust is gained by observing the physical structure or the commendation by a party which has successfully transacted with the concerned organization in the past. On the contrary, trust can be acquired in an e-Business environment by the use of trusted seals, assured Quality of Service, or even by making the websites attractive. All these methods, however, lack "human interaction" and hence, is a major hindrance in the cultivation of mutual trust between the customer and the seller [6].

Trust is a bidirectional process, which must be mutual at different levels in either direction amongst the relying party (receiver) and trusted party (sender). It is a conviction that a word or an assurance by the seller can be relied upon and the seller will not take advantage of buyer's susceptibility [4]. An e-Business can be successful if the buyer trusts the person and place involved in online business and feels secure in transacting over the Internet. For this reason, trust is an important ingredient for success in electronic commerce.

A major problem with online based transactions is page-jacking [3], which diverts you away from the link you are seeking and brings you into a parallel web where the site is a mere reproduction of the original site. These are fashioned by the hackers to observe customer behavior such as buying patterns, products of interest or even to steal credit card or other details. The whole course of action is opaque for the customer.

The paper is divided into three segments. The first part deals with various Standards of Trust. The next segment addresses Business related concerns of Trust. Finally we have illustrated the interaction of customers with the business environment emphasizing on the requirement of trust.

2. TRUST- BUSINESS CONCERNS

2.1. Transaction

The goal of any business transaction is to initiate and accomplish an agreement for exchange of goods and services. It is a set of predetermined set of operations between the transacting entities (sellers and receivers). The artifacts exchanged are messages, contracts, goods and services. The exchange of these goods and services can take place between two peer organizations, between organization and individual or between individual and individual through a physical communication channel.

2.2. Security

Information Security is an integral part of overall Trust. A transaction needs to be atomic i.e. it should be fault tolerant such that no party suffers loss [6]. The principle goal of Security includes Authentication, Non-Repudiation and Integrity. A customer's user-name and password is verified and he is authenticated to do transaction only if his user-

name and password matches with the previously stored database entry. It also helps in providing unique identity to each user. Non-Repudiation is needed so as to preclude the customer to deny the order of goods or services after transacting. The artifacts sent by the sender should reach the receiver with no modifications i.e. the integrity of the artifact should be maintained.

Many security measures exist which can be used to secure transmission. For instance, when user sends his credit card number through the secured channel it is encrypted using protocols such as SSL, SET or JEPI(Joint electronic payment initiative) [1,6]. A major drawback of these protocols is, they are not outfitted to protect vendors from the customers who make fraud payments. Hence a dynamic mechanism is needed to propagate trust. Digital Certificates, tools to provide secure online services uniquely identifies each vendor. They are not issued by a single agency and hence it its very difficult to verify the authenticity of these certificates.
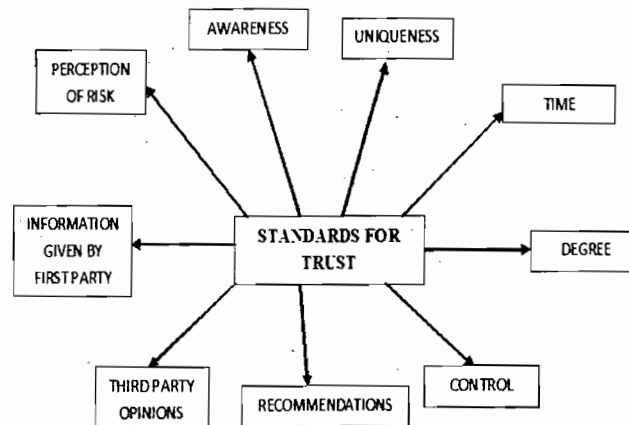

Figure 1: Standards Of Trust

3. STANDARDS OF TRUST

The most basic of all standards of trust is *Uniqueness* which is the state of being able to set apart from others dealing in the same sphere [4].It depends to a great extent on the number of unquestionable interactions between an individual and a company. The next standard of trust is *Awareness*. Both the parties, in any business should know each other before they start a transaction. Some of the attributes that can help an individual know about a company or an organization are the privacy and security features offered, the past performance and also the reliability with which the transaction is accomplished.

Furthermore, *Control* is an essential standard for trust. Formal set of controls include seals, third party certification and rules and regulations that enumerate the type of required behavior and penalties. Social control measures take a longer time to be established than formal ones as they stipulate the organizational and cultural values and norms to promote the required behavior. It deals more with training and interacting with people to set up a long term association.

Degree is the extent or limit to which the trustor is willing to engage in a transaction with the trustee in case of a risky situation. Trust is a subject of commitment and is earned by meeting expectations. The commitment comes with *time*.

When one party realizes that the other party can be trusted, it reciprocates and hence, a strong, reliable bond is established between the two parties.

In addition to all the above mentioned standards, the *first party* i.e. the organization needs to clearly and explicitly put forth details such as delivery methods, modes of payment, description of product, availability and various other policies. The opinion presented by *Third party* such as Consumer Reports or media essentially affects the reputation of the organization.

Last but not the least, the *recommendations* by family, friends and acquaintances play a major role in gaining faith on a particular organization. *Perception of risks* is probably the most important of all the standards of trust. Risk and trust are closely related. If the relying party, under any circumstances, is willing to transact with the trusted party under a risky situation as well, former is said to trust the latter.

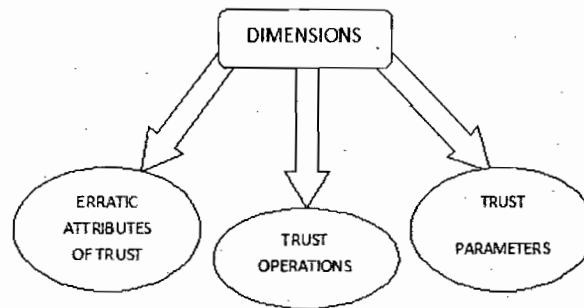## 4. EVALUATION OF RISK IN RELATION TO TRUST

Figure 1: Dimensions Of Trust

Erratic Attributes of Trust [1] are the variables on which trust depends. Some of them are listed below

- Cost associated with the transaction: The seller should be assured that the buyer has enough funds in his bank account or credit card to undergo a transaction.

- Past transactions: A list of all the previous transactions the buyer has endured is maintained. This can be a primary facet for taking a decision in case of a risky situation wherein the past records of the customers can be viewed before considering them to be trustworthy.

- Remuneration: If there is guarantee that a trusted agent shall bear the loss, trust level fosters.

- Customer Fidelity: Several enticements such as points, free gifts are offered to the loyal customers, it will be more likely that they will try to be more true to the seller.

The above mentioned attributes influence *operations* taken by buyers or sellers. These operations are:

- Each and every transaction should be verified by both the vendor and the customer. Vendor validates the payment made by the customer and the customer makes sure that the bill is in accordance to the trueness of the goods.

- Restrictions should be placed on the unauthorized users. Proper authorization mechanism must be used.

- Proper mechanisms for encryption, authentication, message integrity and non-repudiation should be employed.

The number of transactions in a given time period and the forwarding of transactions through mediators are some of the *parameters* that alter the trust attributes.

5. TRUST AS A BACKBONE FOR HUMAN-MACHINE INTERACTION

The interaction between human and machine with trust as a backbone is illustrated above. Humans involved in case of any transaction are the buyer and the seller. A seller can be considered as reliable if he

- Uses trusted digital seals or certificates which are issued by well known Third party.

- Appropriates Quality of Service

- Puts on the site a generic picture of the store along with a logo that is identified as the seal of company.

- Provides warranty for after delivery service in case of any quandary with the product delivered.

A buyer can be considered as trustworthy by

- Observing his attitude towards shopping at the store. This can be monitored by keeping a track of his previous transactions with the store.

- Examining how interested he is in buying the product by either taking feedbacks or conducting market surveys and the customer identifies himself along with the same.

The effectiveness of any transaction can be calculated by considering how efficiently the system on which the user is working functions. Some of the deciding parameters are

- How dependable is the communication channel and system is in case of failure, load etc. Both the terminals should function properly and reliably

- Persistence is the availability of the machine's data even after it has been shutdown. Suppose, a server is not available and the transaction of the client must be completed, proper messages must be displayed at the client's end and the server must redirect it to another to complete it.

- Predictability refers to the degree that a correct forecast of a system's state can be made either qualitatively or quantitatively.

- Technical Competence is that the human skills must be updated according to the need of the hour, and the machine must realize the required changes. Also, the machine should keep pace with the current state-of-the-art technology to be able to serve the user in a much better way always.

6. CONCLUSION

The paper deals with the standards that ought to be satisfied for the establishment of a trust relation between two or more parties.
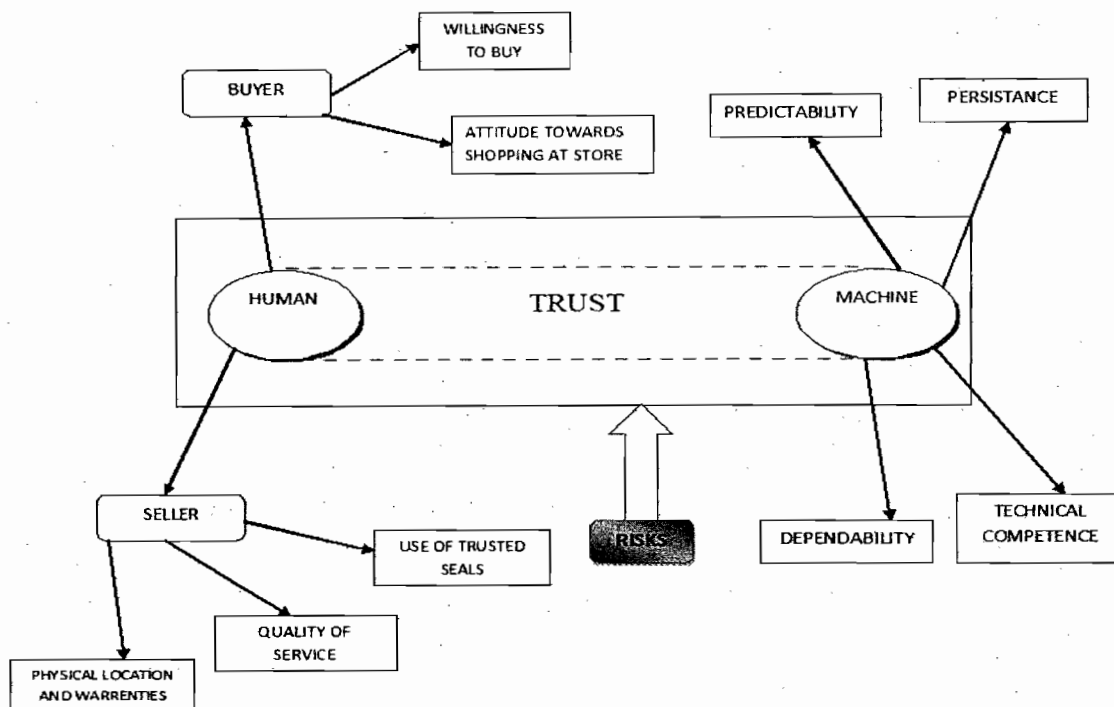

Figure 3: Illustration of Trust as a Backbone for Human Machine Interaction

In case of a traditional business environment human interaction exists and securing trust is relatively simpler than in an electronic environment wherein, no face to face interaction of buyer and seller occur. Consequently, a need for a trust mechanism is identified.

A discussion is carried out to understand the process of transaction and the necessity of security in an e-Business environment. Various standards needed for the foundation of a trust relation between a relying and trusted party are studied and scrutinized.
Finally, a schematic diagram exemplifying the interaction of human and machines with a staunch trust backbone is formulated stipulating a variety of factors on which each of the two depends.

E-Businesses are reachable from anywhere, any part of the world and any time. This gives rise to a number of obstructions in the deployment and maintenance of trust in such an environment. There is a need to conceive a list of factors that positively or negatively effect trust, which can be further used to steer implementation techniques for new e-Business applications.

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