

Identify Effective Factors for Improving E-Trust of E-Transactions in the Context of E-Commerce and E-Government

Issa Najafi

*Assistant Professor, Computer & IT Engineering Department
Quchan University of Advanced Technologies Engineering*

Abstract— Nowadays, application of e-commerce for companies or economic corporates and also entities and states has changed to an unavoidable issue, seeming necessary to observe its advantages and disadvantages. Due to the performance of processes in virtual or cyber site, e-commerce has been always followed by many worries, challenges and problems for all users including companies, people and states. To ensure relatively and reduce the available problems, the solutions of using a safe commerce are paid serious attention. They will relatively provide security for e-commerce information, which is a necessary condition for a safe commerce. But trust seems to be essential for a business or contract. Called e-trust, trust in virtual site includes 3 main elements of parties to trust (Trustee and Truster), field of trust (laws and regulations, infrastructure and size) and object of trust (trust on entity or company, trust on product or services). In this case, there is a mutual interaction containing an entity or company as truster, on the one hand, and entity and company as trustee, on the other hand, and it is agreed that the first party to ensure his total expectations of oral and written promises and words will be met for the other party. There are two main approaches or classes in trust called as static approach showing the dimensions of trust including definition of trust variables, trying to analyze it to the more concrete factors and variables, determining effective and intervening variables in trust, and also process approach representing the way of trust and steps such as way of formation, continuation, development methods and finally removing trust is paid more attention. In this article, we try to study views and models for trust in commerce, reliability, trust management in e-commerce in difference aspects such as dimensions, measurements, increasing or decreasing factors, measurement, methods of establishment, protection and other related factors.

Keywords— *E-Trust , Improving, E-Trust Methods ,E-Trust Models, E-Trust Measuring, E-Trust Building*

I. INTRODUCTION

Today advantages of online shopping on anyone not wearing. With this technology exchanges and development of economic and financial transactions and achieve results in time and costs, savings can be significant. Information and statistics reflect the fact that the use of online purchases is growing and the forecasts suggests that continuation of this trend. Despite the growth process which online Internet purchases using electronic payment methods as well as their undeniable benefits, still use traditional methods preferred by the buyers are. However, according to projections done in the not too distant future, the use of electronic purchasing methods in the field of competition, traditional methods will overtake the current. Authors believe that the three shipping, payment and trust the main three factors are important and that have direct impact on the development of B2C. Weakness in any of the above factors reduce customer trust in online purchases is. To develop the technology, should reduce the

risks to the first two factors (transport, payments) and increased trust in trying to be the third factor.

This research has been implemented to study the effects of trust factors over e-transactions in the fields of management and commerce. The e-commerce (EC), whose simplest definition is the implementation of any commercial transaction by online mode and through internet, today is used not only as an innovative solution between buyers and sellers for the implementation of transactions by online mode, but in many countries organizations and governments represent a considerable part of their services to recipients in the circles of e-service mechanism. Therefore, the electronic government as well, which is defined as government and adjunct agencies' service provisions to citizens, in the context of the internet, is directly related with EC[1].

In fact , trust and security are represented in detail as two key concepts of e-transactions, in case of the first the existing two basic challenges make the formation of trust between both transacting parties slightly risky. For the management of that unsafe environment, it is necessary to create security and trust in the EC system. It has been discussed about security and trust in online environment, about the 'truster' (who is endowed with psychological, individual, experimental and cultural specific peculiarities that affect others towards the probability of the individual's trust) and the 'trustee' (in the framework of his features are virtue, capability, good will, being predictable and unanimous). In virtual environment, contrary to the real, the truster is the customer who deals with e-transactions through website and on the opposite side the trustee is considered the given website[1]. Perform all e-commerce business using computer networks, particularly the Internet. E-commerce, somehow, is paperless trading. Various definitions for e-commerce provided that they are often based on past experience in using e-commerce has been. European Commission e-commerce in 1997 to define the form said: "The e-commerce processing and electronic transfer of data, including text, sound and image is based. Various e-commerce activities such as electronic exchange of goods and services, demands immediate digital delivery, electronic funds transfer, electronic stock exchanges, electronic bill of lading, commercial design, direct marketing and after sales service includes.

E-Trust is relatively a new concept in all companies, organizations and every electronic environment. In E-Commerce and E-Government Context, It is the tendency to adopt a position of vulnerability by the consumer towards the internet seller, to which is related the positive expectations of the seller's subsequent behaviour [1]. Today, the businesses are divided into three types or forms. Therefore, factors affecting the relationship between customers and vendors in

trade either small, medium (SMEs) or large enterprise scale, such as security, satisfaction, loyalty and trust must be examined in each form. In addition, the behaviors before purchase, during purchase, after the purchase are also different with each other in three forms of commercial transactions, and the topic of trust is brought up in a chain of trading processes. In other words, to assess the trust of the people or customers to any electronic trading system, we have to review and compare factors of trust and security in the chain of E-Business. Trust is a factor whose establishment is influenced by the type of the business, because the business types (Brick & Mortar, Click & Mortar, Brick & Click) are actually the way of interaction between the two parties involved in exchange and its chain. The flow of information in any type of business has its diversity and difference. In fact in three types of businesses have been introduced in which the effective factors on the trust of commercial associates in each one have some differences and similarities to the other.

There is no consensus on definition of E-Commerce, Turban, et al. (2008) [68] define E-Commerce as the process of buying, selling, transferring, or exchanging products, services, and/or information via computer networks, including the Internet [68]. Turban et al. further distinguishes between Internet and non-Internet E-Commerce [68]. The non-Internet E-Commerce includes for example buying and paying for services or product with smart card through vending machines and/or transactions undertaking via network such as Local Area networks (LAN), using intranets or even single computerized machine. Some researchers see E-Commerce in terms of Internet applications, such as Intranet, extranet, website and email [69].

II. TRUST AND E-COMMERCE

E-Commerce is defined as 'those commercial transactions performed on open networks' (OECD/GD, 1997) [62]. Therefore, factors affecting the relationship between customers and vendors, small and large scale businesses such as security, satisfaction, loyalty, trust must be examined in each form. In addition, the behavior before buying, when to buy, then buy the three together formed commercial transactions are different and must be evaluated and compared. Trust is the key factor that influences the acquisition of the business because the business is trading virtually the same mode of interaction between the parties. Trust is an interdisciplinary term and has numerous applications in different sciences like law, psychology, sociology, economics and commerce. Experts of each field have presented a specific definition about the trust according to their area of work and expertise.

These statements reflect the role of the concept of trust in daily interactions. The experts of each field of science have taken trust into their consideration from their own point of view, so that the psychologists consider trust as a personal

attribute, sociologists consider it as a social structure and economists consider it as an economic selection mechanism. Adherents of one field may not understand and approve the other fields' points of view about trust. Therefore the currently suggested definitions are very different from each other and most of them are accumulated along an interdisciplinary line. However we can discuss the reason of existing differences in the definitions of trust from two perspectives. First, the trust is an abstract concept and sometimes is misguided with other concepts such as validity, reliability and comfort. Second, the trust is a multifaceted concept and has intuitive and behavioral aspects.

In fact, trust has studied in commercial field as two aspects: Firstly, originally trust has studied in Brick & Mortar commercial context, we named this type of trust studying "offline trust studying" and others trust has studied on virtual environment (online/ cyber/ Internet/ Web environment), we named this type of trust studying "Online trust studying". About "offline trust" studying, we have very researches and researchers, But studying online trust dates back to the time of the creation of electronic or online business transactions (about three decades).

In trade and commerce, trust is the most important column of exchange establishment. Without gaining trust every exchange, even the ones that are successfully established, will consequently cause disappointment and dissatisfaction in one or both correspondents. Building trust in the reality or virtual environment necessitates the exertion of proper rules and methods respective to its environment. In traditional environment there exist several factors affecting trust building that some of them does not appear in the new virtual or electronic or cyber or web environments.

Among those we can point out the two following factors:

- 1-Sense of the exchange stuff is a feature of traditional commerce, whereas it cannot be fulfilled in the E-Commerce.
- 2-In traditional commerce in order to finalize the interaction of exchange establishment, the correspondents usually shake hands after closure and this handshaking is a sign of trust and acceptance of the exchange establishment, whereas this act is impossible in the E-Commerce as well.

The two above mentioned examples imply the fact that the discussed new environment is different from the old one. In other words the existing factors and agents in the two environments, despite having possible similarities, are distinguished in general.

In this research [1], we attempted to search and categorize the studies in the field of building online trust on the E-Commerce and E-Government context, using scientific resources such as books, papers, printed and online journals since 1998 until the present (2012). In summary, the term trust was discussed and considered in numerous and plenty of resources. Also in every studied aspects of every related field to the internet marketing, internet purchase, online store, E-Transaction, cyber space and web environment, trust has been pointed out as one of the main columns of the topic, either independently or joint with other terms such as security, privacy, policies, loyalty and adherence, satisfaction and bailment.

Various approaches to the field of trust have been surveyed in the current studies. These approaches can be classified in two general categories of static and procedural approaches. In procedural approach, the method of gaining trust is being discussed and its building steps such as formation conditions, continuity state, methods of enhancement and finally, weakening of trust are studied in aggregate or component based form. In static approach after defining the trust variable, one tries to parse it into more intuitive variables and factors which are called the trust dimensions, and then the effective and perturbing variables in the structure of trust are studied. The three latent in trading or business variables are including trust, satisfaction and loyalty[1].

- For Trust, Three Observed variable are sell's evaluation, the seller's the type of payment and seller's secured certificate.
- For satisfaction, four observed variables are quality, price consistency of good and photos and delivery speed.
- With regard to loyalty, three observed are recommendation to others, repurchase intention and membership system.

In various researches, several dimensions for the structure of trust have been introduced. Among those we can point out to the following models:

- Deutsch (1958) [86] : An individual may be said to have trust in the occurrence of an event if he expects its occurrence and his expectation leads to behavior which he perceives to have larger negative motivational subsequences if the expectation is not confirmed than positive motivational consequences if it is confirmed.
- Lewis and Weigert (1985) [58] : Trust exists in a social system insofar as the members of that system act according to and are secure in the expected futures constituted by the presence of each other or their symbolic delegations.
- Hosmer (1995)[15]: Trust is the reliance by one person, group, or firm upon a voluntarily accepted duty on the part of another person, group, or firm to recognize and protect the rights and interests of all others engaged in a joint endeavor or economic exchange (Hosmer, 1995, p. 393). [15]
- Mayer et al. (1995) [79]: The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the truster, irrespective of the ability to control or monitor that other party.[79]
- Rousseau et al. (1998)[57]: Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another.
- Grandison and Sloman (2000)[18] : Trust is the firm belief in the competence of an entity to act dependably, securely, and reliably within a specified context[18]

- La Londe, 2002,... : As a central variable of social exchange theory, trust is a cornerstone in developing and maintaining business relationships (La Londe, 2002, Sherman,1992).[21][22]
- Mui et al. (2002) [16]:Trust is a subjective expectation an agent has about another's future behavior based on the history of their encounters." [16]
- Olmedilla et al.(2005) [6]: Trust of a party X to a party Y for a service Z is the measurable belief of X in that Y behaves dependably for a specified period within a specified context (in relation to service Z)

In most researches about trust features in the E-Commerce, are the concepts of keywords: competence, benevolence, predictability and integrity which are noted. These keywords are studies about buyer's (truster's) attitude, belief, intention and behavior. Attitude includes affect and confidence; Belief includes expectancy[30]. Furthermore, in some researches about trust with procedural approach, which is in fact is a modern viewpoint towards E-Trust, the aspects of building online trust, development of online trust, securing the E-Trust, weakening of trust, etc. are discussed and scrutinized. In these researches which are mostly accomplished after 2000, the following aspects have been are covered:

- Trust building/ online trust/
- In procedural approach of trust, the building of trust in the E-Commerce has various steps or phases which determine the amount or measure of the built trust.
- Unawareness: at first step, the person or buyer is in the state of unawareness but has the tendency to acquire knowledge for participating in the exchange. Thus his/her tendency provides the necessary Context for building of trust at the next step.
- Building trust: in the second stage, the person or buyer is seeking to build a trust Context in himself/herself through searching, review and comparison of the related data about providers of the goods or services. In this phase the person attempts to authenticate the website or electronic vendor, after accomplishing searches, inquisition and comparison. Then he/she proceeds the necessary acts for registering his/her information in the sale portal, exchange participation and confirmation.
- Confirming trust: the stage of trust confirmation is exactly the one in which the person commits to choose and place his/her picked up goods in the online purchase basket and finalizes the process of payment and clearing.
- Maintaining trust: the last step or phase of the E-Trust is the one in which the positive actions of the vendor regarding the in-time delivery, intactness or validity of the goods and services, appropriate customer care and warranty, and making a proper connection to the

customer create a sense of satisfaction and loyalty in the customer. Delivery is the amount of time necessary for the package to go from the distribution centre to the customer’s door. Post-purchase evaluation can be influenced by the efficiency of logistics and customer service. Delivery problem is a very common phenomena existing in the online shopping environment.

Ayass	2008	The consumer's willingness to accept the risks against an internet seller, based on positive expectations about the future behaviors of the seller.
Wang	2009	e-trust is a multi-faceted and context-dependent construct that involves cognitive, behavioral, psychological, cultural, uncertainty and risk factors, among others. Perceived trust can be built and reshaped before, during and after the e-transaction(Wang, 2009).

III. E-TRUST AND E-TRANSACTIONS

Trust in e-transactions is becoming a major key item for determining the success and failure of Internet interactive [81][82]. Different studies (e.g., Kollock[85]; Smith et al. [84], Urban et al.,[81]) present a different type of tools to signal trust in the virtual world. Kollock [85] suggests the implementation of online communities including reputation systems. Links from other trusted websites are also seen as a trust signaling element (Smith et al.)[84]. Technology Framework for Online Trust needs 5 Key Requirements. although this list is NOT exhaustive but constitutes vital elements for trust[1].

- Data Confidentiality (Information accessed only by those authorized)
- Data Integrity (No information added, changed, or taken out.),
- Strong Authentication (Parties are who they pretend to be.),
- Non-repudiation(Originator cannot deny origin or transaction.)
- Infrastructure of trust (Automating the verification of digital credentials)

Table 2 is developed by the researcher about e-trust studying or trust and e-transactions .

Table 2: Trust studying in E-Business or online environment histories as to the results of the researcher

Author	Year	Journal Reference
Gefen & Straub	2003	Managing user trust in B2C e-services. E-Services Journal 2(2)
Pavlou	2003	Consumers acceptance of EC. Integrating trust and risk in the technology acceptance model. International Journal of EC 7 (3).
Pennington, Wilcox, & grover	2003	The Role of systems trust in B2C transactions. Journal of management Information Systems, 20(3).
Pavlou & Gefen	2004	Building Effective marketplaces with institution-based trust. Information Systems Researches, 15(1). [83]
Gefen & Straub	2004	Consumer Trust in B2C EC and the importance of social presence : Experiments in e-products and e-services, Omega, 32.[77]
Koufaris & Hampton Soa	2004	The development of an initial trust in an online company by new customers. Information Management, 41(3).
Walkefeild, Stocks, & Wilder	2004	The Role of web site characteristic in initial trust formation. Journal of computer Information Systems, 45(1) [26]
Mcknight, Kacmar, & Choudhury	2004	Dispositional trust and distrust distinctions in predicting high and low-risk Internet expert advice site perceptions. E-service Journal, 3(2).
M. Lee & Lee	2006	Consumers' initial trust toward second hand products in the e- markets. Journal of Computer Information Systems, 46(2) [17]

Transaction means an action or set of actions occurring between two or more persons relating to the conduct of business, commercial or governmental affairs[67]. The E-Transactions is a comprehensive piece of legislation aimed at providing clarity on the usage of electronic documents, records, signatures, and transactions. An e-transaction is the sale or purchase of goods or services whether between business, households, individuals, governments and other public or private organizations conducted over computer mediated networks. The goods and services are ordered over the networks, but the payment and the ultimate delivery of goods or services may be conducted on or off-line [90].

A secure E-Transaction (SET) is an open-source and cryptography-based protocol for secure payment processing via non-secure networks. In Year 2003, SET was published as RFC 3538. SET was replaced by more advanced systems, such VISA’s 3-D Secure [89].

The Traditional Business Model The number of interactions between second and third parties dictates the level of complexity in the business process. In a simple transaction, the customer requests to buy something from a seller, pays the money and receives the goods or service. In a more complex traditional international transaction, a series of activities involving transportation, customs, warehousing, payment and insurance are undertaken between the seller, the buyer and the freight forwarder. The propensity for mistake in such a convoluted system is obvious and also costly to all parties concerned. Integrating the constituents of the system into a new ecommerce model presents both opportunities and challenges.

In Traditional Business Model, Pre-purchase information will be defined as a series of data processed according to consumer-specific purposes. Consumers have special characteristics that recognize optimal information from resources and consumers act depending on their own given situation [48]).

In particular, the ability to collect product information and make comparisons between the different product offerings from various providers possibly across national and currency boundaries is often viewed as one of the main competitive challenges of e-shopping. To enhance consumer pre-purchase information processing, companies offer other information sources to [20]. have shown that the retailer or manufacturer on the web should provide consumer-customized information so that the consumer evaluates alternatives in the consideration sets. Accordingly, the web retailer or manufacturer must provide more appropriate information to

attract, meet, and exceed consumer expectations than must in-store retailers.

The new E-Commerce trade models, includes an integrated environment which enables legislative, banking, insurance, freight and transportation transactions to be carried out in a systematic and timely way. The serious barrier presently, to such a model is the lack of standardization of commerce procedures. However, future developments through the WTO (World Trade Organization), International Chamber of Commerce and the United Nation Development Program will assist in harmonizing fragmented trade procedures in to a homogenous set, thereby facilitating a cohesive electronic trade environment.

Many E-Commerce activities are classified as B2C (business-to-consumer) in which individual consumers purchase goods or services from online merchants. C2C (consumer-to-consumer) is another popular E-Commerce model, in which consumers sell to each other at popular online auctions. B2B (business-to-business) E-Commerce involves one enterprise buying goods or services from another enterprise. B2G (business-to-government) E-Commerce aims to help businesses sell to government. Usually, when in e-trade employs a network to put individuals in direct contact with each other in some form, this class of E-Business, It is called P2P E-Commerce.

E-Commerce has become a universal trade event in the world. By creating trade more competitive and productive, E-Commerce is main factor for both developed and developing every countries in restorative their economies and in supporting national economic growth. In fact it is, as respects, that after more than a decade of growth, E-Commerce diffusion and adaptation is still dissimilar between different countries and a digital divide of E-Commerce adoption is broaden in the world. Here researchers have some challenges such as, policy-makers and practitioners to better understand the event and to certify the potential and opportunity presented by E-Commerce is taken and realized in all trades. E-Commerce Dimensions are involve: (Market or Business Models, Communication Protocols, Product Ontology's, Personalization, Marketplace Visualizations, Trust & Reputation, Privacy Policy & Information Security, Payments Systems & Transaction Processing, Intermediaries, Legal & Laws Issues).

E-Commerce can take several forms depending on the degree of digitization (the transformation from physical to digital) involved. The degree of digitization can relate to: the product (service) sold, the process and the delivery agent (or intermediary).

A product can be physical or digital, the process can be physical or digital, and the delivery agent can be physical or digital. In traditional commerce all three dimensions are physical, an in pure E-Commerce all dimensions are digital. All other combinations include a mix of digital and physical dimensions. If there is at least one digital dimension, we consider the situation E-Commerce but only partial E-Commerce. For example, buying a shirt at Wal-Mart Online, or a book from Amazon.com is partial E-Commerce, because

the merchandise is physically delivered by FedEx. However, buying an e-book from Amazon.com or software store from gentari.com is pure E-Commerce, because the product, its delivery, payment, and transfer agent are all done online.

In E-Commerce A Managerial Perspective (Turban et al., 2000)[87], reference is made to a model representing the dimensions of E-Commerce. This model, originated by Choi et al in 1997 [78], argues that there are three constituent factors in E-Commerce, namely Product (or Service), Process and Delivery Agent. These three dimensions can be categorized as either physical or digital. In traditional trade all dimensions are physical whereas in pure e-commerce all dimensions are digital [87]. This allows for eight possible combinations, each of which, with the exception of where all three dimensions are physical, can be legitimately termed as E-Commerce. E-Commerce framework of six levels has been formed as follows. 1) Application services. / 2) Brokerage and Data services, Data or transaction management. / 3) Interface and Support Layers. / 4) Secure Messaging, Security, and Electronic Document Interchange. / 5) Middleware and Structured document interchange. / 6) Network infrastructure and basic communications services.

Incorporation and integration of the three levels in another six levels, three levels of framework to be discussed is summarized. This frame work of three levels of E-Commerce infrastructure, services and products has been established. The infrastructure includes hardware, software, database and communication are, for duty in the form of services through the Internet, EDI and other forms of support and messages Mark Booth messages through the Internet or other networks are used in. Services, including messaging and message-making and investment and a wide range of abilities needed to find and provide information (if needed in the form of its business) and search for potential business partners as well, negotiation and agreement on the trade be. Products, forecast and provision of goods and services directly related to business information for customers and business partners, cooperate and share information inside and outside the organization and organize electronic market environment for doing business with the final disposition of consumer (purchase of remote banking operations, stock broker, advertising), trade between companies or major business activities, business affairs within the organization, is formed. Responsibility to make sure security in E-Commerce systems in E-Commerce application layer, the custodian or owner of the E-Business enterprise is. But the layers and other surface infrastructure, security talk a little more complicated and responsible custodians of a series of matters, including Internet service providers, software engineers and security systems and information is. High security and appropriate E-Commerce system, the most important element of creating trust in E-Commerce or E-Transactions and makes the same point of the East, the customer decides to purchase goods or services in the context of E-Transactions and so-called deal is welded.

E-Commerce has a three-tier system model. These three tiers refer to three main component viz. Client side, server side and

the connecting bridge which is known as Internet. These three make an E-Commerce system model. However, for fulfilling any order, we need to integrate other systems as well such as supplier system, warehouse system, logistics system, etc. In such a scenario, the web browser is the interfacing page which is the client interfacing page. This also called the graphic user interface (GUI). The back end tier is the combination of data and application server, where all business logic and database are stored. To connect these two tiers, internet becomes the middle tier that allows the users to connect through the internet, which acts as a medium. As the clients and application servers are connected to the internet, there is a need to arrange a rule-based mechanism or system that will authorize each of these tiers to “talk” to each other. These rules are “protocols” that authorize these talks to happen through certain processes. This protocol is called the HTTP.

The internet a base of connection for international E-Commerce, is a form of connected networks via electronic devices, i. e. computers. It can be accessed worldwide, and uses the standardized Internet Protocol Suite (TCP/IP) to transport data and message anywhere in the world and permit communication between parties across a large distance.[70]. More fully, internet and application server form the basic infrastructure for the E-Commerce system. E-Commerce systems, when designed and implemented correctly, can generate drastic reductions in administrative, sales and marketing overheads, and encourage more sales, larger sales, and repeat business. Each E-Commerce System should be provides innovative technical solutions and expert marketing advice to ensure businesses get the most out of businesses E-Commerce system. Figure 3 shows the stage of E-Commerce development and its characteristics, which were represented by Subba Rao, S. et al. in 2003 [64].

E-Commerce solutions have evolved to include core functionality for navigation, shopping cart, checkout, shipping and handling, and taxes and some level of integration to an order management system (OMS), an enterprise resource planning (ERP) system, or a warehouse management system (WMS). Then there are the Web 2.0 options: rich media with audio and visual tools, customer product reviews, social networking, blogs. Newer technology also provides functionality for options such as mouse-over (move the mouse over an image and the description will display without the user's having to click on the image), drag and drop (simply drag the item to the shopping cart without leaving the current page), and one-page checkout.

The E-Commerce, as to the nature of the transaction between both parties, is represented in various classifications and includes a framework of computer programs and systems that undertake services in the internet, which are search for information, exchange management, study of rating condition, provision of rating, online payment mode, summary of report and account management. These systems, which we call them E-Commerce integrated systems, consist of two main sections include front office and back office [10]. These are the foundations which insure the internet organized activities, increasing the efficiency of transacting parties. For these

transactions, system security must be provided and create the necessary ground for mutual trust between the parties, trust towards the system operation, as well as trust towards the relevant product, brand or service.

E-Commerce means the accomplishment of commercial exchanges between the customers and suppliers electronically. The term “internet” is often used as the buying or selling channel for the electronic communications in these exchanges. In the E-Commerce the formation of EM (E-Marketing) is prior to any activities. The EM is formed when the appropriate technical infrastructures (information databases, servers, software, etc.) are provided and connection to the customer is confirmed using this technology. This relation is taken into account in the process of website design. Effective website design includes navigation capability or visual appeal of the website (Cyr, 2008) [19]. Customer satisfaction in E-Commerce is related to the quality of website design (Cho and Park, 2001) [20]. Lee and Lin (2005)[38] had empirically found that website design positively influences overall customer satisfaction and perceived service quality[38].

Electronic commerce, also known as e-commerce, is more specific than e-business, it means that in addition to providing information to visitors about the company, its history, policies, products, and job opportunities, the company or site offers to transact or facilitate the selling of products and services online. (Kotler 2003)[56]. E-Commerce is the process of buying and selling goods and services electronically with computerized business transactions using the Internet, networks, and other digital technologies. (Laudon and Laudon 2005)[7].

E-Commerce has changed how firms do business and is now defining how firms do business. E-Commerce is the process of managing online financial transactions by individuals and companies. This includes business-to-business (B2B), business-to-consumer (B2C) and business-to-government (B2G) transactions. The focus of E-Commerce is on the systems and procedures whereby financial documents and information of all types are exchanged. This includes online credit card transactions, e-cash, e-billing, e-cheques, electronic invoices, purchase order and financial statements.

E-Commerce is often described as being one of four varieties – business-to-business (B2B), business-to-consumer (B2C), Consumer-to-Consumer (C2C) or business-to-government (B2G). Most of statistics has focused on this B2B and B2C. About 80 per cent of the total value of E-Commerce in the world today are accounted for by B2B E-Commerce. B2C E-Commerce has the potential to substantially affect the way in which people live and interact with each other and is therefore a key aspect for statistical measurement. P Smith and Chaffey [80] further around that E-Business should operate on a stage model comprising the following six steps that must occur sequentially : Messaging (internal and external e-mails),Marketing and stock availability checks, Online ordering, Online payment, Monitor order progress, E-business).

About main difference between B2B and B2C it's considerable because, during the emersion of e-commerce, companies willing to establishment business process

reengineering on their organizations have integrated their systems with those of their planning, suppliers, distributors and Supports, using appropriative networks for EDI. Whereas, these interactive systems are used to exchange not only informational, but also data of commercial, they illustrate the first formation of B2B E-Commerce. In B2C E-Commerce it is attractive that all parties engaged in a commercial interaction in EDI are bound to find and trust each other, since they have been individually linked using a private value-added network (VAN). In fact, it seems rational to take that a user engaging in B2C E-Commerce does not perceive the system as a work tool, however rather as a means to order some goods or services for personal use.[23]

IV. TRUST, RISK, PRIVACY, SECURITY AND REPUTATION

Security and trust in E-Commerce, two elements are related to each other. If E-Commerce system components can be trusted to draw customers with high immunity against all kinds of hazards have been. E-Commerce system security, privacy issues (information and resources to hide and prevent unauthorized disclosure of information or resources), accuracy (to prevent unauthorized data changes), accessibility (the ability to retain the use of resources and information systems by authorized users) access control (decision-making process about any request access to information and system resources) will review. In general, the purpose of security mechanisms is to protect against attacks and malicious activities. Common security mechanisms typically use authentication methods and access control procedures to protect their computer resources. However, in many situations it is needed that we protect ourselves against resources that provide some services. Between these two approaches to security, there is a difference that is due to the concepts of soft security and hard security which are described as follows: The concept of hard security is for the first case, for example strict security procedures such as identity authentication and access control. The concept of soft security is for the second case, for example the trust and reputation systems.

In many security models, the concept of confidence level of system security is presented which shows that how much the system is resistant against devastator attacks from malicious agents. In fact it indicates a general overview of the amount of our trust to the system. Trust also has a very important role in the security of communication. The security of communication in fact is the way of encryption of data in the communication channel and authentication of present identities using encryption methods. Identity authentication actually provides a type of trust called username (ID) trust which indicates the amount of validity of one party's claim to the other side of communication channel. The term "trusted supplier" is also sometimes used in the industry instead of digital certification provision centers. The trust that is supplied by the systems of basic username access control and also centers of digital certificate provision is called the ID trust.

Das & Teng (2004, p 110) [37] take a risk-based view of trust; defining trust as 'a mirror image of risk'[42]. On the other

hand, Coleman (1990) [4] and Williamson (1993) [5] identify trust as subclass of risk because both deal with uncertainty and probability. One thing we should be able to agree upon; trust is predicated upon uncertainty (Bhattacharya & Devinney, 1998) [54]. If there were no risk involved in our day-to-day interactions with others, the notion of trust would not emerge (Golembiewski & McConkie, 1975) [65]. Everything would be certain, as we expect. Clearly, we do not live in a world of certainty. The rate of change is faster now than any other previous time in human history (Marshall, 2000)[46]. In times of change trust is important because it bridges barriers, helps us form friendships, partnerships and alliances in most situations (Buchan, Croson, & Dawes, 2002) [45].

For risk to be involved in a situation there needs to be a probability of loss or gain (Mayer et al., 1995)[79]. For example, as managers we provide scarce resources like computer equipment and money to our staff in expectation that their efforts will lead to positive outcomes such as the sale of our products and services. In doing so, there is a probability that our investment may not return what we expect. If our resources have been expended and the result is no sales, we have effectively lost our resources.

On the other hand, we have made a gain if resource expenditure results in sales with above average profits. As managers, we evaluate the risk involved in a situation to determine the probability of success or failure. As a trustor, the trustee is considered trustworthy when we feel secure in the knowledge that the actions of the individual, group or organization will not harm or put us at risk (Jones & George, 1998)[47].

Trusting relationships involve a confidence that no party to the exchange will exploit the other's vulnerability (Jones & George, 1998)[47]. A willingness to take risks may be one of the few attributes of all situations involving uncertainty (Davis, Schoorman, Mayer, & Tan, 2000)[66]. Trust is a risk taking behaviour or a willingness to be vulnerable (Costa, 2003)[43]. We extend trust in situations of uncertainty (Mayer & Gavin, 2005)[44] in expectation of positive outcomes (Das & Teng, 2004)[42]. In summary, risk is a theme that affects how we trust; the other trust themes are dynamics, expectation, principles, competence and context.

The concepts, Trust, Risk, Privacy and Security, are widely used in various studies done by multiple disciplines, and they are often incorrectly referred to almost as synonyms. The aim is to clarify the concepts from the consumer viewpoint in E-Commerce. One of the importance parameters on the context e-transaction considerations is, of course, security. The hardware, software, and physical plant developed and used by Business companies services are carefully coordinated with an aggressive set of best practices to provide maximum protection and integrity at the transport, system, and physical levels. on the other hand Security is one of the most important features of a business site or E-Commerce portals. Electronic settlement, signatures, and electronic money flow are essential for any EC business. Therefore, more sophisticated cryptography and authentication technologies must be developed and deployed. In addition, key issues in the security

administration function of service management must be addressed. There is a widely perceived risk attached to payments made via the Internet, and this perception is in some circumstances justified. The information sent from the customer to the Web server may pass through many different stages before being delivered. The information is in digital form, and at any stage an unauthorized individual may scan every message looking for credit card numbers (which are easily identified). Therefore, any E-Commerce site must be secure to prevent fraud. In the e-transaction context all companies should be try to safe the transport Security (for data and information transport, goods transport), System Security and Physical Security.

In E-Transactions buyers should reassurance that the information they secure and private key into the system. In Internet interaction importance packages support with industry standard SSL (Secure Socket Layer) protocol. The SSL protocol encrypts (or scrambles) every message on the network making it extremely difficult for anyone who intercepts the message to extract your customers' information. The US government views encryption technology as munitions, and therefore the only version of SSL available worldwide is the relatively weak 40-bit version [2]. A second example of an existing and widely used security mechanism is the SET (Secure E-Transaction) protocol that is developed in partnership by Visa and MasterCard. SET ensures a secure payment infrastructure for E-Commerce by using public cryptographic keys and providing the user with a special code that can be used anywhere and is unique to the holder. Trust appeared with the humanity and the development of social interaction. Almost every aspect of a person's life is based on one or another way in trust. So, trust is a very rich concept, covering a wide range of relationships, conjoining a variety of objects. The concept of trust is intimately linked to risk and expectations: trust is used as a substitute for risk, but it also creates risk for the truster [3].

Today, there is mistakenly a similarity of conception in the computer science for both trust and reputation. According to the definition in some dictionaries, reputation means: "What has been said in general about someone's character or condition of something." But trust in regard to the relations between two individuals or even two computer based systems is discussed in a particular field, and it indicates that there is a degree of uncertainty in the result of interaction or relationship. Trust is a sign that there exists some kind of optimism and hope in the result or output. Some researchers believe that the concept of trusted is not a computable concept, and it only makes sense in the specific social relationships of human, such as love.

In contrast, some others disagree with this opinion and have proposed computational models for the trust. In computer science and also in the field of distributed environments, different people have suggested various and different definitions of trust and have attempted to make their own definition to comply with the characteristics and specifications of the studied environment.

In fact, the trust has a concept beyond reputation. This means that in the issue of trust, in addition to the others' comments and statements, there is also some kind of personal and subjective judgment. The difference between reputation and trust has been explained in the following example[11]. A- I trust you, because of your good reputation. / B- I trust you, despite your bad reputation.

Although in many cases, the systems of trust and systems of reputation are considered identical, but the trust systems have properties and factors beyond a system of reputation and rating. A variety of computational models have been proposed that in each case are different variables have been considered for trust. In some cases, a discrete set and sometimes a continuous numerical range has been determined for the allowable intervals of variables of trust. The discrete set includes the choices of {very reliable, reliable, unreliable and highly unreliable}. Also for the continuous interval, the interval between 0 and 1 is the most common set for the allowable values of a trust variable that is used in many of models. Trust is brought up in many different fields. The context that the trust is discussed in, would actually explain the meaning of trust, and it is referred to in terms of ordination of trust or the field of trust.

Trust is important for companies, because it makes possible the relationships that form the coordinating components of integration, which, like gears, turn the wheels of trade [24]. The factor 'trust' is probably one of the major variables influencing interpersonal behavior and determining human interaction (e.g., Golembiewski and McConkie 1975 [65]). A situation requiring trust is by definition embodied with risk and the possibility of loss on behalf of the trustor (Deutsch 1958) [86]. Management research (e.g., Lewis and Weigert 1985[58]; Coleman 1990 [4]) has focused on trust primarily from a calculative and risk-oriented perspective of the agent. Definitions for the terms of the trust provided that the following can be mentioned:

- ✓ "Reliance on the integrity, ability, or character of a person or thing"
- ✓ "A relationship of reliance dependent on what other people say."
- ✓ "An agent's estimate of how likely another is to fulfill its commitments "
- ✓ Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another. (Rousseau et al. (1998)[57]).

Trust is defined as an individual's (trustor, here is citizen) belief or expectation that another party (trustee, here E-Government) will perform a particular action important to trustor in the absence of trustor's control over trustee's performance (Mayer, Davis, & Schoorman, 1995)[79]. The word of "Trust" is a multidimensional word. Generally, the term confidence uncertainties are discussed below.

- Is a catalyst for human cooperation?
- It underlies all aspects of human interaction?
- Is different in different contexts?
- Is a two way phenomenon?

Implies relying on another party in a situation of risk and uncertainty where strength of harmful event > strength of beneficiary event.

Some aspects of the importance of trust in E-Commerce include:

- Lack of trust is the main barrier
- Fundamental differences between nature of Trust in physical world and E-Commerce

• Spatial and temporal separation between partners
Many factors are affecting Trust in E-Commerce, some of which include: Privacy Issues, Security Risks, Lack of reliability. To enhance Trust in E-Commerce to be effective on many factors, some of which are in the fields of technology and strategies include: Web Interface elements, Self regulation and Trustmark seals P3P, Anonymisers & Informediary, Security strategies, Payment Intermediaries & Insurance, providers, Reputation Systems, Alternative dispute Resolution systems.

We often discuss the forces of digital include computers, networks, Internet, mobile and social as transformational, as they strip away the boundaries of time, distance, and mobility that have constrained humans for millennia. The unrestricted freedom to communicate, explore, and choose has, in turn, reshaped customer or user expectations of not only value, but also trust and transparency. These “free” customers both demand and create transparency, as with the simple tap of a finger, people can find out virtually everything about any company. There is simply no way to hide or “spin” the facts, and if you do, you violate the trust that will dissipate in an instant in today’s socially networked world. To earn the trust of “free” customers in a transparent world requires companies to truly differentiate and effectively engage their consumers on a more human and authentic level through digital, mobile and social technologies. These are exciting times to say the least; times that are causing us to be increasingly digital and human in the quest to capitalize on this new model for delivering value and building trust specially on E-Commerce and E-Government contexts.

As Baier states : Trust involves the belief that others will, so far as they can, look after our interests, that they will not take advantage or harm us. Therefore, trust involves personal vulnerability caused by uncertainty about the future behavior of others, we cannot be sure, but we believe that they will be benign, or at least not malign, and act accordingly in a way which may possibly put us at risk. [75].

Consumer risks within Internet environments are characterized as follows:

- 1) Financial risk [49], expressed as financial loss from a buying decision made on the web site;
- 2) Psychological risk [50], a negative effect on consumer image or privacy because of a product purchase;
- 3) Performance risk [51], when products or services purchased on the Internet do not meet consumer expectation;
- 4) Time-loss risk[52], occurring from the need to re-purchase if the original purchase was unsatisfactory or from the time spent searching for optimal information[53].

The profile of the trustee, such as the educational status and job position, is utilized, e.g., when it comes to collaboration partner selection or activity assignment. The profile describes if the trustee owns the formal competencies to be trusted to perform a given activity reliably.

In table 4 we show some information about Contextual Orientation of Trust Concepts.[30]

Here the word of trust is used as a surrogate for “willing to depend on” or “intends to depend on” (trusting intentions or disposition to trust), “believes is the [attribute] of “{trusting beliefs it is a context conducive to success” (institution-based trust) [30].

Disposition to Trust means the extent to which one displays a consistent tendency to be willing to depend on general others across a broad spectrum of situations and persons. Disposition to trust differs from trusting intentions in that it refers to general other people rather than to specific other people. This construct hails primarily from dispositional psychology. Every E-Commerce Customer Relationship Trust Constructs models have some factors and components include: Web Vendor or Business (Privacy Policy)/ Third Party Seals, Interacting with Customers/ Reputations Building, Links to other sites, Guarantee...)/ Web Vendor Interventions/ Trust-Related Internet Behaviors(Purchasing) / Information Sharing, Cooperating).

V. DIFFERENT TYPES OF TRUST IN E- TRANSACTIONS

- Knowledge-based trust: This level of trust means that I’ve had enough experience with you and knowledge of your behavior that I have a pretty good idea of how you will react and behave in interactive with me. We’ve had sufficient interactions over time where there has been a consistent show of trustworthy behavior that I believe I can trust to you with the every time type issues we experience together. This is the kind of trust that most of our day-to-day professional relationships.
- Deterrence-based trust / Rules-based trust : This is the most fundamental, base level of trust in all relationships. Rules-Based trust means that there are rules in place that prevent one person from taking advantage of, or harming another person. In fact in the world we have legal that governments our behavior in trade and personal regulating . When we work in business we have covenants that vouch one party can trust another to hold up their end of the transactions. In corporate's we have procedures and policies that provide limitation for how we relation and treat each other, and if we breach those rules, usually there are outcomes awful.
- Identity-based trust: This level of trust means that trustee know truster hopes, dreams, goals, ambitions, fears, and doubts. Truster trust to Trustee at this level because over the policy of time truster have increased her/his level of transparency and vulnerability with trustee and trustee haven’t taken advantage of truster. Trustee have proven himself to be loyal, understanding, and accepting. Identity-based trust isn’t suitable for every relationship. This level of trust is generally used for the most important

people in our lives such as our spouse, family, children, and close friends. Yet with the proper limitation in place, this level of trust can unlock higher ranks of creativity, efficiency, effectiveness and performance in firms.

- **Calculus-based. Trust :** This means that a person will try to anticipate the behavior of the other person and based on that anticipation and calculation, the person will determine which level of trust will be given to another person.
- **Institution based-Trust:** Means one believes, with feelings of relative security, that favorable conditions are in place that are conducive to situational success in a risky endeavor or aspect of one's life. This construct comes from the sociology tradition positing that people can rely on others because of structures, situations, or roles that provide assurances that things will go well. Institution-based trust refers to beliefs about those protective structures, not about the people involved. Therefore, it focuses on an impersonal object.
- **Policy-based trust:** This kind of trust for establishing trust using policies and focused on managing and interchanging credentials and performing access policies. Using in policy-based trust usually assumes that trust is created simply by acquiring a enough amount of credentials pertaining to a specific section, and using the policies to grant that section certain access rights. The recursive issue of trusting the credentials is repeatedly solved by using a trusted third-party to serve as an potency for confirming credentials.
- **Reputation-based trust.** Using reputation to establish trust, where past interactions or performance for an entity are combined to assess its future behavior. this trust levels uses the history of an entity's actions/behavior to computing trust, and may use referral-based trust (information from others) in the lack of (or in addition to) first-hand information. In the latter case, work is being done to compute trust over social networks (a graph where vertices are people and edges denote a social relationship between people), or across paths of trust. Recommendations are trust decisions made by other users, and combining these decisions to synthesize a new one, often personalized, is another commonly addressed problem.
- **General models of trust.** There is a wealth of research on modeling and defining trust, its prerequisites, conditions, components, and consequences. this models of trust are useful for investigation human and agentised trust decisions and for operationalizing measurable models of trust. Work in modeling trust describes values or factors that play a role in computing trust, and leans more on work in psychology and sociology for a decomposition of what trust comprises. Modeling research ranges from simple access control polices (which specify who to trust to access data or re) to analyses of competence, beliefs, risk, importance, utility, etc. These subcomponents underlying trust help our understanding of the more

subtle and complex aspects of composing, capturing, and using trust in computational setting.

- **Trust in information resources.** Trust is an increasingly common theme in Web related research regarding whether Web re and Web sites are reliable. Moreover, trust on the Web has its own range of varying uses and meanings, including capturing ratings from users about the quality of information and services they have used, how web site design influences trust on content and content providers, propagating trust over links, etc.. With the advent of the Semantic Web, new work in trust is harnessing both the potential gained from machine understanding, and addressing the problems of reliance on the content available in the web so that agents in the Semantic Web can finally build trust decisions automatically. Origin of information is key to support trust decisions, as is automated detection of beliefs as different from target information.

In various categorizations of the E-Commerce types (B2C, B2B, C2C, C2B, B2B2C, G2B, G2C, B2G, etc.) different factors and agents such as web based programs, service provider, communication Context and the receiver (customer) must cooperate to create and shape an E-Commerce. In case of considering it as a system, we will be able to categorize these agents and operators in four main context of "production, presenting, transfer and reception" of the goods or services. These areas which can be viewed as the main covering areas of an E-Commerce system have a major role in construction and shaping of the E-Commerce. But despite significant advances in the area of the application of ICT in every aspects of human life such as economics and trading, today the process of gaining trust and security establishment has become one of the greatest concerns of the costumers or citizens in the cyber space. Although the trust and security are two complementary arms and traditionally and even in many statements or manuscripts these two words are used as synonyms but the fact is, in virtual environment the two words do not necessarily have similar meanings. Because the term "security" is used for the subject of protection of data and information systems from unauthorized activities like unauthorized accessing, using, disclosure, reading, recording or inscription, destroying, changing and manipulation. However the trust differs from security, since the term "trust" is used when there is going to be an interaction in a relationship of which on one side is a person or company referred to as "the truster" and on the other side is a person or company as "the trustee". The truster acquires confidence about the fact that his general expectations on the words, promises, written and unwritten statements of the trustee will be met. In other words, the onset of the trust subject is built on an interactive Context or basis between at least two correspondents.

VI. TRUST PROPERTIES AND ASSESSMENT IN ONLINE ENVIRONMENT

paragraphs Trust according to the area that will be discussed in, is likely to indicate different characteristics.

1. Being personal: in the issue of trust to a specific person, different people may have different views. Trust is the subjective probability by which an individual, A, expects that another individual, B, performs a given action on which its welfare depends. This definition includes the concept of dependence on the trusted party, and the reliability probability of the trusted party. A method for deriving trust from a transitive trust path is an element which is normally found in trust / reputation systems [73].

2. Reflective: almost in all models of trust, it is assumed that each person fully trust himself/herself.

3. Asymmetry: if A have trust in B, then B does not necessarily trust A.

4. Transitivity (Pseudo transitive) : Transitivity is a highly desired property of a trust metric.[13] In situations where A trusts B and B trusts C, transitivity concerns the extent to which A trusts C. but this amount is not necessarily identical to the amount of trust that B has in C and it is rather less than or utmost equal to it. Without transitivity, trust metrics are unlikely to be used to reason about trust in more complex relationships. The more thorough approach distinguishes between different contexts of trust, and does not allow for transitivity between contexts that are semantically incompatible or inappropriate. Contextual approach may, for instance, distinguish between trust in a particular competence, trust in honesty, trust in the ability to formulate a valid opinion, or trust in the ability to consolidate another's opinions. Contextual approach is often used in trust-based service composition[14]. This property causes the creation of two different types of trust

Direct trust, i.e. the personal opinion of the truster about the trustee according to previous interactions and his/her behavior. Indirect trust, i.e. the trust that truster individual extracts from the questioning from others and through their comments and opinions.

5. Dynamism: our trust in a person may become less or more as the time passes as well as sensing changes in his/her behavior. Some environmental factors such as time and location may also influence the level of our trust in others.

6. Combinability: a person derives the level of his/her trust to another person through other individuals.

-In this inference process, the truster person acquires some variables through some different paths to the person who is going to be trusted.

-Combination of trust is one of the essential parts of the trust inference algorithms that are explained in trust models. The weighted average method is one of most common operators that are used in determining the combination of trust in distributed environments.

The combinability property of trust is used to design the net model of trust in virtual environment.

7. Scalability :The growing size of networks of trust make scalability another desired property, meaning that it is computationally feasible to calculate the metric for large networks. Scalability usually puts two requirements of the metric: The elementary operation (e.g. fusion or discount) is computationally feasible, e.g. that relationships between

context of trust can be quickly established. The number of elementary operations scale slowly with the growth of the network.

8. Attack resistance : Attack resistance is an important non-functional property of trust metrics which reflects their ability not to be overly influenced by agents who try to manipulate the trust metric and who participate in bad faith (i.e. who aim to abuse the presumption of trust).

VII. CATEGORIES OF TRUST IN THE FIELD OF APPLICATION OF COMPUTER SCIENCE

Constrained trust: this kind of trust describes the trust on a service provider or specific supplier. This trust is referred to whenever the user wants to be secure against the people who provide insecure and sabotaging services.

Access trust: the purpose of access trust is protection of resources against unauthorized and bad accesses. This trust is related to the models of access control which are an essential part of security models.

Representative trust: when we grant representation from ourselves to another agent for doing a task, the representative trust makes sense.

ID trust: this kind of trust proves that the ID the other party of communication is merely the same as he/she claims. The ID trust is commonly used in the information security.

Background trust: this kind of trust means that how much the truster individual trusts the environmental conditions for establishing his/her transactions.

Security and trust in virtual environments of purchase and marketing or dealing business are considered as major issues of today's trade. In order to establish the security of user authentication, immunization of the communication channel for exchanging the information between traders and also trust to the provided commodity is necessary. In most of the online exchanges, the seller first receives the price of goods from the online buyer and therefore the seller will not need to trust the buyer. It is the buyer who may be rather unsatisfied about the delivered goods or services. Thus in this section, the problem of trust to the seller as well as the desired product or service arises.

Since online buyers and online sellers are separated by space, the likelihood increases that one party will end up empty handed (Kollok 1999)[85]. Accordingly, this new type of market transaction form is predestined for developing mechanism to manage this risk. Depending on who does the 'first move', our framework distinguishes two insurance models for online B2C transactions: (1) delivery insurance and (2) consumer credit insurance.

Several models have been proposed to build trust in virtual environments of purchase and marketing. Most of them use a kind of scoring method to indicate the reputation value of a user (seller or buyer).

Most online shopping consumers generate a sense of trust toward the websites throughout their use; however, the network convenience and sales interaction methods simultaneously generate noteworthy moral problems. (Yang Chandrees, Lin, and Chao, 2009) [59].

This reputation value is calculated for a user in some ways through the amount of trust the other users have in that particular user. But in the topic of trust measurement for online trading systems, there exist some major challenges that seriously impede the issue of measurement or estimation of trust. Some of these challenges are explained as follows. {Little motivation for rating (many users may not have enough motivation to vote about a subject) / Tendency to vote positively/ Unfair votes/ Change of the username (a user may enter the site through another username after his rating is dropped). In order to deal with this problem, the rating of the new users can be reduced to the lowest possible level.}. Deviation from the quality over time (the amount of an individual's reputation may be reduced by passing time). Voting multiple times (it may be possible a user exceeds the allowable limit of rating times or privilege for another user). In order to deal with this challenge, a mechanism must be implemented that only after the transaction the parties are able to vote for each other.

-Trust through the common PGP (Pretty Good Privacy) protocols.

Pretty Good Privacy (PGP) is a popular program used to encrypt and decrypt message or e-mail over the Internet. It can also be used to send an encrypted digital signature that lets the receiver verify the sender's identity and know that the message was not changed en route. Available both as freeware and in a low-cost commercial version, PGP is the most widely used privacy-ensuring program by individuals and is also used by many corporations. PGP can also be used to encrypt files being stored so that they are unreadable by other users or intruders. PGP uses a variation of the public key system. In this system, each user has a publicly known encryption key and a private key known only to that user. You encrypt a message you send to someone else using their public key. When they receive it, they decrypt it using their private key.

Since encrypting an entire message can be time-consuming, PGP uses a faster encryption algorithm to encrypt the message and then uses the public key to encrypt the shorter key that was used to encrypt the entire message. Both the encrypted message and the short key are sent to the receiver who first uses the receiver's private key to decrypt the short key and then uses that key to decrypt the message. In the PGP models of trust there are two main parts which are called: the laws and the facts. Rules describe how to derive trust from the facts and realities. For example, in the statement "I trust someone who is trustworthy in the opinion of two of my trustees" some examples of the facts included are: "I trust X", "I trust Y", "X trusts Z" and "Y trusts Z" From these facts and the mentioned law it can be inferred that "I trust Z".

Trust in the PKI can be achieved through trust in the signatories of the certification. Based on this, the following services with regard to the security and trust in the PKI must be conducted. Confidentiality of electronic financial transactions in the E-Commerce through encrypting the contents of transactions. The opposite side of a transaction is sure that only he/she could decrypt the encrypted text or content, and no one else is able to do so. No kind of denying

can happen. In addition, existence of the hierarchical, network, and interconnected structures in the PKI can also provide the required trust to the opposite party for the buyer or seller, even in case that the other party belongs to another country or another organization. The concept of cross certificates in the PKI provides such type of trust.

VIII. TRUST MEASURING AND FORMAL METRICS

Formal metrics focus on facilitating trust modeling, specifically for large scale models that represent trust as an abstract system (e.g. social network or web of trust). Consequently, they may provide weaker insight into the psychology of trust, or in particulars of empirical data collection. Formal metrics tend to have a strong foundations in algebra, probability or logic.

There is no widely recognized way to attribute value to the level of trust, with each representation of a 'trust value' claiming certain advantages and disadvantages. There are systems that assume only binary values,[27] that use fixed scale,[28] where confidence range from -100 to +100 (while excluding zero),[29] from 0 to 1 [16][12] or from [-1 to +1];[31] where confidence is discrete or continuous, one-dimensional or have many dimensions.[32] Some metrics use ordered set of values without attempting to convert them to any particular numerical range (e.g.[33] See [34] for a detailed overview.

There is also a disagreement about the semantics of some values. The disagreement regarding the attribution of values to levels of trust is specifically visible when it comes to the meaning of zero and to negative values. For example, zero may indicate either the lack of trust (but not distrust), or lack of information, or a deep distrust. Negative values, if allowed, usually indicate distrust, but there is a doubt [35] whether distrust is simply trust with a negative sign, or a phenomenon of its own.

Subjective probability: Subjective probability [36] focuses on trustor's self-assessment about his trust in the trustee. Such an assessment can be framed as an anticipation regarding future behavior of the trustee, and expressed in terms of probability. Such a probability is subjective as it is specific to the given trustor, his assessment of the situation, information available to him etc. In the same situation other trustors may have a different level of a subjective probability.

Subjective probability creates a valuable link between formalization and empirical experimentation. Formally, subjective probability can benefit from available tools of probability and statistics. Empirically, subjective probability can be measured through one-side bets. Assuming that the potential gain is fixed, the amount that a person bets can be used to estimate his subjective probability of a transaction. Building Trust in E-Commerce Website: Every online business wants to increase sales, revenue and customer loyalty. In an trying to do so, online firms will offer promotions, create forums , create social media contests, and advertise their companies or brands. All of these campaigns are good, but there's one less common way that not many people think about that can help reach this goal: building a trustworthy

website. Building a trustworthy website consists of two components: reputation and security. Basically, security concerns in E-Commerce can be divided into concerns about user authentication and concerns about data and transaction safety (Ratnasingham, 1998[39].

According to the prior research [40] (Elliot & Fowell, 2000[76]; Szymanski & Hise, 2000[41]), as perception of security risk decreases, satisfaction with the information service of online stores is expected to increase. In other words, strong security attribute does increase the degree of customer satisfaction. Security means providing users with a guarantee that your website is secure. You may know your site is secure, but don't assume visitors do. Additionally, the recent wave of website security breaches, hacks and lost data means the issue of security is more important than ever to your visitors.

Paulou through conducting interviews with E-Commerce customers argues that consumers' trust has a direct impact on Perceived usefulness and Perceived ease of use [60]. In addition, on discussing the impact of trust on consumers' online purchase intention in uncertainty finds that trust positively influences purchase willingness through Perceived usefulness [61].

IX. TRUST MODELLING IN COLLABORATION SYSTEMS

Collaborative systems accessible on the Web authorize millions of Internet users to share information through a growing collection of tools and platforms such as blogs, shared forums and wikis. All of these systems are include information and resources with various degrees of sensitivity. Although, the open matter of such infrastructures makes it hard for web-users to determine the reliability of the available information and trustworthiness of information providers.

Accordingly, making trust management systems to using collaborative systems can play a main role in the formation and popularity of trustable information. Trust promotes mutual understanding and global collaboration (Child, 2001) [63]. As common in the trust research literature, the roles of actors in a directed trust relation are defined as trustor (also truster), which is the trusting entity, and trustee which is the trusted entity. Trust relations E between entities N – the actors in our mixed systems environment – are managed in a directed graph model $G = (N,E)$ [9].

Table 5 : Trust Modeling in Collaborations Adopted from Skopik [9]

(a) Direct trust.	(b) Recommendation	(c) Reputation.
<p>Direct Trust Relations. These relations base on first-hand experiences and are inferred from the success and outcome of previous interactions between the trustor and the trustee.</p>	<p>These relations, based on second-hand experiences, are inferred from the success and outcome of previous interactions between a well trusted entity and the trustee.</p>	<p>Reputation is a concept where trust of the trustor to the trustee is completely inferred from third party relationships</p>
<p>n1=Trustor, n2=Trustee</p>	<p>n3=Recommender</p>	<p>n3,n4,n5=Reputing actors</p>

Perhaps the reason for the disparate perspectives of the scientific disciplines is the multitude of facets to the phenomena called trust. Trust appears burdened with a plethora of descriptive adjectives. Lewicki & Bunker (1996) [76] suggest that trust maybe categorised based on the perspective from which it is viewed. For example, from the organisational perspective, professional-trust exists among similar professionals (Misztal, 2002) whose common interests lubricate intra- and inter-organizational collaborations (Oliver, 1997) which Rus (2005) views as network-trust. Similarly, institutional-trust results from institutional arrangements characterised in a sociological perspective (Zucker, 1986)[67] ; it is the security one feels in a supported situation where we have 'guarantees, safety nets, or other structures' to support our endeavours (McKnight et al., 1998)[72]. For example, we trust in our 'main foundation' institution, our government, to look after our best interests (John Child,2001, p. 276); organisational-trust 'is a type of institutional trust' (Wong, Ngo, & 2003, p. 487).

From the perspective of trust-based transactions, some use economic-trust to explain human choice (Miller, 1992); while others use financial-trust to explain our confidence to deposit money in a banking institution in expectation of it being returned with interest. From an interpersonal perspective, knowledge-based-trust (Abrams et al., 2003) assumes the parties have first-hand knowledge of one another based on a history of information-sharing (McKnight et al., 1998)[72]. Similarly, competence-based-trust is important for the transfer of tacit knowledge (Levin et al. 2002). Mollering's (2005) theoretical analysis of trust identifies three types of trust:

- 1) rational-trust involving choice based on perceived trustworthiness in a specific context;
- 2) institutional-trust based on the trustor's natural propensity to trust in certain situations,
- 3) active-trust that involves the development of trust in fast changing situations.

Electronic trust in the e-commerce of type Company to Consumer has multiple stages which the first stage begins with total unawareness of the online shopper about the online seller and continues with formation and after formation the stage of maintenance (continuance) of trust comes. No trust is

everlasting and finally in the lifecycle of trust there will be a dropping and vanishing stage. In the e-commerce, gaining trust is a difficult and complex issue, hence its maintaining and prevention from loss has a vital importance for the online seller who is referred to as the online trustee.

In summary, five core trust themes have been identified: 1) the capabilities or competence of the trustee; / 2) the principles and standards under which they behave; / 3) the trustor's expectation of the benefits that a rise from a decision to trust; / 4) the notion that trust occurs in situation or context, and; / 5) the dynamic nature of trust. Before we look at each of these themes in more detail, perhaps we should ask ourselves, why do we need to trust in the first place? Close examination identifies that trust occurs in situations where we have a probability that an outcome will differ from what we expect. In a word, 'uncertainty regarding whether the other intends to and will act appropriately is the source of risk [57]. Trust is not needed if our actions proceed with complete certainty and no risk is involved [58].

E-Commerce Trust is Communicated by Six Primary Components. Because time is key to deepening trust. Internet trust is still relatively shallow. Consequently, the firms that suggest trustworthiness are the main determinants of whether someone will take a chance. There are six types of such forms:

1. Seals of Approval Symbols, like VeriSign and Visa, designed to re-assure the visitor that security has been established. The companies that provide these seals of approval are referred to in this report as security brands
2. Brand, The corporation's promise to deliver specific attributes and its credibility based on reputation and the visitor's possible previous experience.

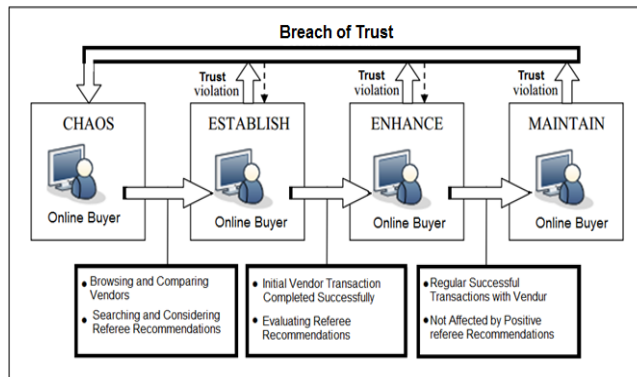


Figure 7 : A Chart of understanding Trust lifecycle (Adapted from Head, M., and Hassanein, K [8])

3. Navigation, The ease of finding what the visitor seeks.
4. Fulfillment, Clearly indicates how orders will be processed, and provides information on how to seek recourse if there are problems.
5. Presentation, Design attributes that connote quality and professionalism.
6. Technology, State of the art connotes professionalism, even if it's difficult to use.

Here are some trust negative factors include: Confidential information sharing, Length of relationship, Perceived powers, Lack of E-Commerce Awareness, Lack of law, Infrastructure, inadequate access, Attacks against the trust management system.

Intended to address user and preparer needs regarding issues of security, availability, processing integrity, online privacy and confidentiality within E-Commerce and other systems. System consists of Infrastructure, Software, People, Procedures, Data. Trust Services issues include :

- Types of Trust Services Engagements
 - Examination or agreed-upon procedures {Web Trust (Assurance on E-Commerce systems), System Trust (Assurance on any system)}
- Web Trust and Sys Trust reports are similar: Assurance is provided on management's assertion relating to the principles and Sys Trust reports may be on one or more of the five principles (Security, Availability, Processing Integrity, Confidentiality, Privacy).
- Designed to incorporate a seal management process
 - Seal (logo) included on a client's website as electronic representation of the report
 - Engagement must be updated at least annually to use the seal
 - Initial reporting period must be at least 2 months

There are many methods for assessment the trust of EC , some of which include the following cases : methods of assessment or measurement of trust in the EC.

1. Computational mathematical methods
2. Managerial methods based on collection of users' feedback
3. Methods based on modeling of information
4. Methods based on decision support systems

-Technology Framework for Online Trust

Three Characteristics that ensure trust in E-Transactions include : Achieving trust in E-Transactions with Digital Signature technology and an effective archiving scheme/ What are digital Signatures? An introduction to Public Key Infrastructure/ An introduction to Archiving digitally signed transactions using XML.

Digital Envelope : Combines the high speed of symmetric encryption (e.g., AES Rijndael) and the key management convenience of public key encryption encryption. Includes PSE (Smartcards, Mega-brid, USB tokens), biometrics, Hardware Security Modules etc.

Digital Certificate: Digital Certificates provide a means of proving your identity in E-Transactions, much like a driver license or a passport does in face-to-face interactions. Digital Certificate technologies (such as eTrust, WebTrust, eCard, And Smartcard) are steps in the right direction. Secure transaction methods using encryption and other technologies have existed for some time, yet the perceived risk of Internet transactions is still significant. As with any innovation, the market needs time to decide for itself about the adoption and diffusion of new trust mechanisms leading to widespread acceptance [74]. With a Digital Certificate, you can assure

friends, business associates, and online services that the electronic information they receive from you are authentic. The most widely accepted format for Digital Certificates is defined by the CCITT X.509 international standard; thus certificates can be read or written by any application complying with X.509 [88]. ITU-T X.509 creates the framework for establishing digital identities – A key component for establishing security and trust for ICT applications in public networks (such as the Internet).

Combines Hash Algorithms (FIPS-180), Key Exchange, Public Key Encryption to provide Data integrity, Non-repudiation and Certificate-based Authentication. Digital credentials are established using ITU-T X.509 Digital Certificate Standard.

Digital signature: In the electronic world, hand-written signatures can be replaced by digital signatures. Like written signatures, digital signatures may be used to establish the identity of a party or to make legal commitments. In addition, digital signatures can also be used to guarantee that the contents of a file or message have not been altered. The E-Transactions Act provides for the recognition of digital signatures under Iranian E-Commerce law. In relational database applications, digital signatures are typically used to ensure data integrity and/or non-repudiation (i.e., proof of origin). Since digital signatures are semantically similar to paper signatures, they are used to streamline business processes by reducing or entirely eliminating the need to print, sign, transfer and store paper documents. The legal framework for holding signers accountable for documents they digitally sign is beginning to take shape [55].

For digital signatures to work, a trusted third party known as a Certification Authority (CA) is needed to issue digital certificates that certify the electronic identities of users and organizations. Before issuing a digital certificate, the CA performs an identity verification on the user or business entity. The CA acts like a trusted electronic notary, telling everyone who the valid users are and what their digital signatures should look like. With a certified electronic identity, an Internet user's digital signatures will then be recognized by parties involved in E-Transactions like Internet banking, online shopping and online information subscription services. The whole system of digital certificates, certificate servers and CAs is collectively known as a Public Key Infrastructure (PKI).

Digital signatures based on digital certificates issued by licensed CAs are automatically considered to be trustworthy and recognized by the law. Just like written signatures, they can be used to sign contracts or to purchase goods and services. To prevent forgery, digital signatures are created using a personal secret code, known as the signing key, which is usually stored in a secure device like a smart card. It is important that the signing key be kept private at all times so that no one else can forge your digital signatures. Loss of a signing key must be reported to the CA immediately.

- Trust Seals (Trustmarks)
- **Trustmark:** A label or visual representation showing participation in a Trustmark scheme. A contributor to a

Trustmark scheme can show a Trustmark if he see the Trustmark requirements.

- **Trustmark schemes:** Any body providing a Trustmark to B2C e-merchants after positive assessment on the basis of own criteria.

-Trust Management and trust and risk on E-Government

Trust management is one of the challenging problems in the using e-transactions. Over the past most years, many researches have done various techniques to improve trust management issues such as identification, integration, personalization, security, privacy, and scalability in web. The classical trust management approach, firstly, was proposed as a solution to the inadequacy of traditional security mechanisms in larger decentralised environments. Roughly, a classical trust management system deals with deciding the so-called compliance checking problem: given a request together with a set of credentials, does the request comply with the local security policy of the provider? The same authors also developed tool-support in the form of PolicyMaker and later KeyNote for handling the trust management problem. In this paper, Weeks displayed a simple mathematical framework, and showed how this framework would instantiate to various existing trust management systems, including KeyNote, SPKI and some logic based systems, sometimes even leading to more efficient algorithms for the compliance checking problem[25].

Citizen Trust in government and technology is imperative to the wide-spread adoption of E-Government . We should analyze the impact of trust and risk perceptions on one's willingness to use E-Government services. (The authors propose a model of E-Government trust composed of disposition to trust: Trust Of the Internet (TOI), Trust Of the government (TOG) and perceived risk.) Results from a citizen survey indicate that disposition to trust positively affects TOI and TOG, which in turn affect intentions to use an E-Government service. TOG also affects negatively perceived risk, which affects use intentions as well. Implications for practice and research are discussed. *E-Government* builds trust between citizens and government. Trust in E-Government is an important idea that should be critically investigated to help citizen favorably share information and make online transaction with government. E-Governments are increasingly becoming a familiar fixture. Nations across the world are realizing the importance of E-Government , the main objective of most E-Government is to better serve citizens. However, citizen's likelihood to use E-Government is low. Lack of trust has been recognized as one of the most barriers to citizen for engaging in E-Government , involving the trust in the internet and the trust in the government. Technology Acceptance Model. The identifies these two main factors that determine citizen trust the E-Government based on technology acceptance model, and reviews its relevant studies that investigate the elements of E-Government trust. The relation between determinants and trust in E-Government . The role of Technology Acceptance Model in the development of trust in E-Government .

-Trusting Intentions {Trust and distrust Definition

Trusting Intentions means one is willing to depend, or intends to depend, on the other party with a feeling of relative security, in spite of lack of control over that party, and even though negative consequences are possible. This Trusting Intentions definition embodies 3 elements synthesized from the trust literature.

1. The possibility of negative consequences or risk or uncertainty makes trust important but problematic. One who trusts is exposed to greater potential harm from a breach of trust than the expected benefit if the trustee comes through.
2. A readiness to depend or rely on another is central to trusting intentions. By depending on another, one makes oneself vulnerable to the results of trustee freedom to act. Freedom to act is assumed in trust relations.
3. A feeling of security means one feels safe, assured, and comfortable (not anxious or fearful) about the prospect of depending on another. The term “relative security” means one has different degrees of felt security or confidence about being willing to depend.

Feelings of security reflect the affective side of trusting intentions or is to feel easy in mind, confidence, or assured in opinion or expectation. Therefore, feelings of relative security involve degrees of confidence or certainty. Trusting intentions involves willingness that is not based on having control or power over the other party. This part of the definition implies that trust is not based on deterrence. Rather than trusting in controls, the trustor trusts in trust. Using control in the definition of trust helps link trust to the control literature, and provides a better on conceptualization of trust, since trust and control, though separate, are integrally linked (e.g.).

The trust antecedents are defined as:

- Trust is ‘the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the Ability to monitor or control that other party’ (Mayer et al., 1995, p. 712)[79].
- Ability is ‘the skills competencies and characteristics that enable a party to have influence over some specific domain’ (Mayer et al., 1995, p. 717)[79].
- Benevolence is ‘the extent to which a trustee is believed to want to do good to the trustor’ (Mayer et al., 1995, p. 718)[79].
- Integrity is ‘the trustor’s perception that the trustee adheres to a set of principles that the trustor finds acceptable’ (Mayer et al., 1995, p. 719).[79].

In each category of E-Commerce e-transaction such as B2C, one party of transaction is the website that plays the role of online trustee and the characteristics of the trustee party can have an essential role in fulfilling the expectations of the other party, i.e. the online trustor.

By proposing this trust building package, the companies were asked to setup and install this solution at their sales portal if they like to. Such that by the beginning of the second year of the surveys, each online customer were asked after finalizing the online purchase process to feedback their opinion if they like to, about their E-Trust level to the

company and referred goods or services by choosing one of the specified options. Since various models have been proposed to calculate the online trust value such as discrete and continuous sets, one can indicate these two cases for the discrete model: Measuring the trust value by the metric of { very untrustworthy, untrustworthy, trustworthy, very trustworthy},{-1,0,1,2} or the ranking set of {-1, 0, 1} known as the famous model of eBay.com website.

Measuring the amount of trust by unit or rankings in the continuous interval of [0,1]. In this part of investigation we used the trust measuring method based on a discrete set {very trustworthy, trustworthy, untrustworthy, very untrustworthy} in order to measure the amount of customers’ trust to the company or its goods and services. In other words, the online customer after each online purchase declares his/her vote about the amount of trust to the company and its product and service. Simultaneously, in the company’s portal by using the extracted quantities from the customer, a rating is automatically assigned to him/her based on the available parameters on the customers’ database. In this method, the ratings of customer to vendor and vendor to customer is assigned in the form of choices from the four-member set of {very trustworthy, trustworthy, untrustworthy, very untrustworthy}, which in this study we mapped it to the discrete set of {-1,0,1,2}. The amount of trust to a vendor will be equal to the total amount of its assigned ratings by each customer per each transaction in a specified period (e.g. monthly). Additionally, the amount of online vendor’s trust to each online customer will be equal to the sum of assigned ratings to the customer by the online vendor per each transaction. In this context, the rating criteria for the vendor to customer may be different from the rating criteria of customer to vendor. Because in the online environment, like the traditional environment, the concerns of exchange parties are different from each other when it comes to trust.

X. CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

E-Commerce websites frequency effect on business firms have. The company's attention to its electronic gateway does not cause distortion of your account and provides self-trust can foster trade and business bankruptcy in your will. Web gateway to a brand - products and services is the product manufacturer. Website without using your colors and go like the old window and the color you used in traditional business and will cause the customers are not willing to buy the product, but also against the best site if possible through the Internet for all People must not be considered and called application (User Friendly) not, there would be no success and therefore companies should result in Internet search firm footing their own. For many users, sites search (search engine) the entry point to the Internet. However, many sites mechanism to measure trust in their portal are. Although customers are sometimes reluctant to comment or unwilling to comment on the negative, or no negative votes. But survey

data from the system, the parties to trust polls, is used to form parties.

The influence of e-trust factors were also studied on the cyclic performance of companies, which pay attention to those factors and it was revealed, that taking into consideration the E-Commerce factors affect positively over the company's activity. Apart from that, trust, as a capital of companies that deal with E-Commerce and for the purpose of using it more profitably, a plan of continuously evaluating mechanism of e-trust readiness level was represented to companies that deal with E-Commerce, where the version of evaluating the effective factors of e-trust of this research were implemented, as creation, preservation and loss prevention means of e-trust for such companies. In accordance with the above, in electronic trading platform, the two pillars of security and trust e-commerce and e-government systems are considered. Secure electronic transactions system, a system that users of the viewing angle, unable to trust them to use the system and attempting to purchase or request payment in electronic banking systems and other electronic services, electronic commerce or other services required customers or users conditions are less risky. Trust and security in electronic transactions system, subject to the mixed and are intertwined. At all levels of the State and e-commerce electronic elements, security and authenticity as an important attribute of the system without ensuring proper function and safe electronic transactions system, trust can not imagine. Since the set of processes electronic transactions in a system is located, so all system components in creating and maintaining trust and security and the impact each defect can also cause distrust in the on be. Cases identified to describe the "rules and regulations, cultural, social and economic infrastructure, infrastructure design technologies used in e-commerce, electronic government and implement the right e-commerce, website or portal used for e-commerce system for communication with customers virtual catalog and portal companies and organizations " are being presentable. E-commerce systems must be backed by legal right, such as spatial insurance companies insured by governments be trusted to do so in the context of electronic transactions and e-government and e-commerce increased in the interests of the people use these technologies governments will benefit and also provide services to people easily, and have the ability to serve the business environment is also developed electronic and e-commerce interests of everyone will benefit. Identified and introduced as factors affecting increasing trust in electronic transactions, a special role in the development of e-commerce has continued research to identify the most influential factor in increasing confidence in electronic transactions and the discovery and use instantaneous ways to measure trust, remarkable help to develop a comprehensive e-commerce and e-government will.

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