

# Challenges of Addressing Certitude and Perception of Consumers Regarding e-Business

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**Abstract**—Perception of consumers when surfing the web for products has been heavily influenced by various factors such as risks, trust issues and uncertainty. Here we study the influence of perceived risk on consumers during the process of adoption of e-commerce. With the reference of the Technology Acceptance Model (TAM), the key issues being listed as the perception of the consumers influencing their decisions have been addressed in order to understand why the people want to use an online service for perception or discard their purchase.

**Index Terms**—Perceived risk, technology acceptance model, trust and uncertainty.

## I. INTRODUCTION

The evolution of the world is transcending the mere idea of daily monetary transactions. We can no longer look at the trends of the yesteryears where purchasing and selling power relied solely on tangibility of the environment and products. However, the thought of buying products online has made the consumers more sensitive and aware to the hazards of the process as opposed to traditional shopping. By traditional shopping, we can deduce the idea that the consumer experiences the actual product in order to remove uncertainty and reduce any possible risks before they make a purchasing decision. This means the consumers will visit physical stores in order to actually feel the product and clear any queries regarding the product in order to make their decision.

Taking this statement to be true we still have to keep in account that even in traditional shopping there is always a factor of perception and uncertainty. Taking this into consideration, the inevitability of consumer perception on the involvement of risk during purchasing should not stop online businesses from flourishing. New challenges involve new risks and new methods or approaches to tackling the challenge. First and foremost we should understand that as a business we are responsible for forecasting consumer perception and reducing the chances of risks in order for the consumers to feel safeguarded in means of privacy and accountability. Typical studies point out the flaws and problems of the current system. This paper is written in

order to try to explain on what can be done to and how to minimize the perception of risk.

The vastness of internet media quickly proposes entrepreneurs to adapt to the new business ideas, new market and form new business models in order to amend to the market demands. The main challenge for the business people is to internalize what the market wants, what are the constraints and how to deliver the needs of the people without the presence of any obstruction along the way. The difference between want and need is pretty clear as a consumer could want the most high end laptop costing about \$5000 but in the end of the day what the consumer needs is basically a system to be able to work on [1]. The focus should be more on how to deliver the customer needs via online transaction in the safest and secure way possible while providing knowledge and trust of the transaction to the consumer. The Business to Consumer (B2C) not only depends on the consumer's perception of the trust in the internet transaction as means of purchase but also on the reputation of the web based retailer as reliable merchants [2]. Trust has been the major issue to consumer's expectancy of receiving the service and product in turn resulting in a satisfying exchange. The first part of the review involves the Technology Acceptance Model (TAM) [3] [4]. The TAM is explained below, analyzed along with perceived risk and its dimensions deducing its influence on e-business adoption.

## II. METHODOLOGY

This review is explanatory and information is generated by literature review. The sources of journals are from internationally acclaimed databases such as emerald, ebsco, amazon, google scholar, etc. The papers were collected over a span of three weeks and reviewed with the context of e-business and management issues regarding e-business. Also a reference of a few online books has been made to define theories.

## III. THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

Davis's [5] Technology Acceptance model is based on the Theory of Reasoned Action explaining the behavior of usage on the new technology. This theory focuses particularly on the beliefs that influence individual attitudes and intentions [6]. Two specific attributes that normally affect a person's decision are perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness means how a system will affect usage in terms of effectiveness and performance. Perceived ease of use refers to how less effort is required in order to use the system. The Theory of Reason action states that system usage is determined by user intentions while TAM considers the attitude towards the

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system and PU. While PU affects the attitude toward the technology, the PEOU affects the user's PU and attitude towards it. From this we can assume the following hypothesis to be true. Attitude towards e-commerce positively influences the intention to shop online. PU positively influences the intention to shop online. PEOU positively influences the attitude to shop online. PEOU positively influences the PU of shopping online [7]. Reference to TAM: Fig. 1.

#### IV. INFLUENCE OF PERCEIVED RISK ON ONLINE SHOPPING

By perception we mean the ability to make sense of reality of the things we are exposed to by sensory stimuli [8]. A regular exposure to certain environment can result in oversensitivity or desensitized emotion. Moreover, our perception depends on the amount of attention we focus on something. We can normally relate to it when we take branding for an example. The second we see a 'tick' sign we know it is Nike as we are so accustomed to seeing it everywhere.

After Bauer's [9] theory of reduction where he states consumer behavior as risk taking, the classical theory of decision has been said to be a variable reflected by consumer's behavior's possible results, probabilities and possible outcomes or values. Looking at perceived risks in a theoretical manner and keeping TAM in consideration several researchers have proposed that perceived in risk in e-commerce has a negative behavior when it comes to shopping online [10].

The main risks proposed in marketing literature are:

1. Economic, monetary or financial risk: Possible money spent on initial purchase, maintenance cost, possible financial loss due to fraud
2. Performance risk: Failure in delivery of the product due to malfunction, hence not meeting the design and performance as advertised.
3. Psychological Risk: Not achieving buying goal resulting in ego loss due to frustration
4. Social Risk: Possible loss of status among social groups due to bad investment in purchasing a product or service by being untrendy
5. Time Risk: Possible loss of time when making a bad purchase by wasting time on research and the actual purchasing only to have to replace the product due to unsatisfying performance not reaching the needs.
6. Privacy Risk: Possibility of loss of control of personal information, unwanted disclosure or use of personal information without consent [11]- [15].

#### V. UNDERSTANDING RISK AND UNCERTAINTY

With potential perceived risk comes uncertainty. In plain simple English, uncertainty could mean unknown constraints at first seeming very subjective. This is far from the truth as uncertainty is not luck but a phenomenon [16]. Uncertainty can be measured by deducing the truth degree

of an uncertain event, uncertain variable used to represent uncertainty quantity and an uncertainty distribution used to describe uncertain variable in a more incomplete but understandable way. Uncertain risk can be an accidental loss with the addition of "uncertain measure of such loss". Risk is the potential outcome of an undesired loss and uncertainty is the quality of being indefinite. This means risks can be managed and uncertainty can be avoided. This is one of the key challenges in e-commerce; how to minimize uncertainty and risk so as to gain trust from the consumers. We have to keep in mind that however big the quantity of risk and uncertainty is involved, it will not influence the decision of a consumer if the consumer is not aware [17]. This does not give the businesses the room to play around with perceived risk and perceived uncertainty. The amount of information a consumer gets plays a very crucial role in influence of decision of the consumer. In turn, insufficient information of the uncertainty could mean a liability to the business as it is a big risk factor in reputation and consumers are less likely to engage in business transaction [18].

#### VI. UNDERSTANDING TRUST

In spite of the presence of uncertainty, when there is a presence of economic and social interactions, we understand that there is a presence of trust. In consumer-marketer relationships, trust is considered to be a catalyst because it raises the expectations in the consumers to have successful transactions[19]. When there is a lack of trust, consumers are more reluctant to using internet for shopping. Jarvenpaa and Tractinsky study pragmatically shows us that consumer purchase intentions in many cultures are directly affected by trust [20].

Trust is a belief that a party will be socially responsible in behavior and fulfill the trusting party's desires and expectations without exploiting vulnerability [21], [22]. Trust in B2C is a belief that consumers willingly become vulnerable keeping provided that they have taken the web retailers characteristics into consideration, hence having a goodwill trust [23], [24]. There has to be some degree of uncertainty for the existence of trust. So this theory suggests that after having known the web retailers characteristics and of the technology infrastructure, the consumers still want to become vulnerable to the system.

According to McKnight and Chervany [23], trust has been defined as something that "begins where prediction ends" and is more of a psychological and sociological make-up than with some real-life state of affairs. Trust is closely related to confidentiality, secrecy, and privacy, whereby *confidentiality* deals with a commitment of not disclosing private information to others and *privacy* is the right of an individual to protect and retain one's own information. Technically, if the system needs to be considered trustworthy from the view point of consumers, it must also express the above dimensions of trustworthiness to the users in a way that they can comprehend easily. [25] In the human dimension, an environment of trust is possible by building a strong brand reputation, good relationships with the consumers and digitally signed certificates to guarantee a sense of trust [25].

## VII. PURCHASE INTENT AND SOCIAL CONTEXT

A customer's past purchasing experience definitely influences his future purchasing tendency- bad experiences in the past purchasing of online transactions will deter his mind from pursuing future transactions online and vice versa. Consumers also compare their experience in traditional shopping in physical stores to that of online stores and this affects the social mindset of the purchasers which further impacts the intention to purchase online. E-business companies face lot of challenges in order to use persuasive techniques to motivate customers to purchase online- however, they must remember the importance of seeking loyal customers rather than seeking increased number of customers to shop online [26].

## VIII. TRUST AND PERCEIVED RISK: INTEGRATION WITH TAM

It is important for trust and perceived risk to be relatively consistent with ease of use and useful. This supports Ajzen and Fishbein's [5] theory that when expanding a model it is important to keep in account of the consistency of new variables with the existing variables. Trust and perceived risk deals with retailers and single transaction decision influenced by external variables. PU and PEOU also deal with a solitary technology acceptance decision in a particular system and time frame. Although objective reality could have a hand, trust and perceived risk primarily deal with variable interpretation of the willingness to trust and risk, provided that the information about the reality is limited. Likewise, PU and PEOU deals with a consumer's perception of usefulness provided that the knowledge of the real world system is limited. Thus trust and perceived risk is coherent with PU and PEOU, which is used to measure general beliefs without listing specific details. Trust and perceived risk are also general perception without accounting specific details of the retailer's characteristics [2].

The behavior of transaction and the intention to transact are most likely to be influenced by other variables as well in addition to those already accounted for. An example to this is that the frequency of online shopping can determine purchasing intention [27] By intention to transact we simply understand a consumer's intention to engage in online exchange relationships with retailers, for example share information and maintain business relationship [28]. In spite of the increase in the number of internet users, recent research showed that 75 percent of online consumers discard their shopping carts before purchase [6]. This is a huge threat to the web retailers because they want consumers who buy their products and not just browse. Even if the browsers discard their shopping carts, when they finally decide not to purchase, we can understand that their initial intentions during exchange of information was to complete the transaction process if all went according to their plans and expectations [29]. The Required variables to control are as follows:

- i. Reputation of Retailer: This is the most important predecessor of trust, perceived risk and purchase intention.
- ii. Satisfaction with previous transactions: The positive

outcome of past transactions influences the future intentions

- iii. Frequency of shopping: Frequent shoppers are the most likely to continue transacting online.

## IX. POTENTIAL E-COMMERCE RISKS

- Physical threats – Undertaking risks on the infrastructure. For example, fire or flood.
- Data threats – the threat of virus infestation on database, software or files
- Human error – Error while data entry by the employees or accidental deletion of data
- Hoax – Rumors created by humans on nonexistent threats posing to end up being an actual threat.
- Technical failure – Hardware/software crash
- Infrastructure failure – server crash
- Fraud – credit card, information, payment
- Malicious attacks – DDOS attack
- Hacking threats [30]

These kinds of risks have adverse effects on the perception of the safety in e-commerce to the consumers. The best way to tackle these kinds of risks is avoidance. This means to opt not to enter a new working method just because of the risks that could follow. This is however not always practical. This would mean risk transfer is an option. There are two methods of risk transfer – insurance and contracting the job to a third party so as to transfer risks to another party. This method however could cost more money [30].

When it comes to tackling the threats there are various ways to ward off the risks. To reduce the risks you could decide on what information should be public, perception that your business is secure could be increased, warnings could be clearly stated in the websites, information could be made more private, antivirus and alert systems could be implemented, process of opening attachments could be done by using an online viewer to prevent viruses that are hidden. To reduce the vulnerability, firewall filters could be enabled, authentication processes should be implemented and clear to the users, digital certificates should be used to clear trust, virtual private networks could be implemented for a more secure network, the networking and operating system protections could be enforced [30].

## X. UNDERSTANDING THE MODEL FOR CREATING AN ENVIRONMENT OF TRUST

Based on the model with four basic practices regarding the use and gathering of personal information about the users (Privacy Online 1998) it is recommended that [25]:

- Sites to provide the user with details of their information collecting practices along with the methods used for gathering the information;
- Sites to offer the user the possibility to choose how this information can be used for these other purposes;
- Sites to offer the user access to gathered information with the opportunity to correct any inaccuracies and
- Sites should attempt to protect the security and integrity of that information.

The main components to generate a feeling of e-commerce trust were considered the following [25]:

1. Seals of approval – symbols, like VeriSign or Visa, to establish a sense of security to the user.
2. Brand – reputed brands that are doing well online and traditionally.
3. Navigation – the convenience with which the user can access and find information.
4. Fulfilment – information on how things will proceed and where to seek help if something goes wrong.
5. Presentation – high-quality design that represents quality and professional standards.
6. Technology – high technology gives a feeling of professionalism, even though they may be difficult to comprehend.

According to Nielsen [25], trustworthiness can be communicated through use of seals of approval, brand reputation, appropriate use of technology, and through design in the following manner:

- **Design quality:** a good professional appearance; clear navigation conveys respect for customers accompanied with a pronounced promise for good service.
- **Up-front disclosure:** of all aspects of the customer relationship. For example, shipping charges should be revealed immediately before an order has been placed so as to ensure that there are no hidden charges incurred.
- **Comprehensive, correct, and current:** detailed explanation about the content that is regularly updated, is essential to relate well to customers.
- **Connected to the rest of the Web:** with links in and out. Connections with third-party sites give the required credibility.

According to Fogg[25] the role of perception, involves *perceived* trustworthiness and *perceived* expertise forming part of *perceived* credibility and that credibility matters when computers are the medium of instruction of advice for users, reporting of measurements, providing information and analysis and reporting of work performed.

## XI. FACTORS AFFECTING TRUST-FORMATION PROCESS IN ONLINE SITUATIONS

Following elements could affect factors of trust-formation online [25]:

- Personal attitude to others (trusting/distrusting) and cultural factors- Various customers have different personal attitudes and culture depending on which they tend to trust or distrust online shopping. For example, customers in the western communities are prone mostly to online shopping as they prefer to sit at home and shop and many of their occupation and study also thrive on websites. In eastern culture, people prefer to go for shopping in traditional brick and mortar stores and hence look at online stores in a dubious manner [25].
- Previous experience from the specific web-shop, or real-life vendor- Past exposure to online and offline shopping whether good or bad experiences do make a difference to the attitude of shoppers in deciding to make a purchase. Those who have good experience in traditional stores prefer to continue shopping in physical stores and avoid online purchases and vice versa [25].

- Known brand, or trustworthy design-Well known brands that have a strong long standing credibility in the market tend to sell well whether be it in online stores or in brick and mortar stores as customers have already formed a sense of trust for these brands [25].
- Right price, or secure payment method-If the online stores offer very secure payment methods, then, customers would prefer to shop online as the advantage of shopping at a time when they are not carrying cash on their person is very attractive to customers especially when they need to make a purchase during the days when they don't carry heavy cash [25].
- Right delivery conditions-Customers trust shops that have a good logistics service and when they don't need to wait for endless days in order to receive goods after making a purchase.
- Financial or reputational risk on service provider-Reputation is very important for service providers to get respect from consumers as they tend to make purchases only from those providers on whom they could place trust before they spend their money [25].
- Privacy policy- A secure privacy policy is very crucial for customers to maintain their privacy while doing online transactions as otherwise their privacy is at stake while handling their private information including personal credit cards and other such sensitive information [25].

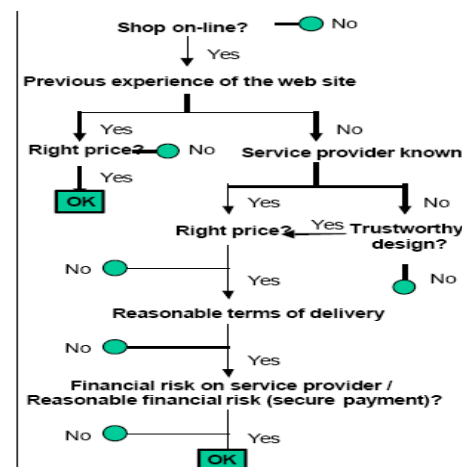


Fig. 1. A flow chart of the transaction process and the trust decisions [25].

## XII. THE EFFECTS OF DESIGN ON TRUST

The basic requirements for trusted design, thus, include the design to be at least the following [25]:

- Carefree: Security is not of top priority to the users but the feel of the design should be that of ease, fun, and user-friendly.
- Appropriate: Design must match with the content to give a feeling of credibility.
- Usable: The site must be in accordance with the ISO usability standards of effectiveness, efficiency, and satisfaction.
- Creating flow:

The transaction process should be smooth and fast. Making security more interesting, or even fun:

Most of the times, understanding security measures can be boring- in order to make it interesting, the websites could use fun elements like the way they do in the Disney world website whereby kids get to browse through 'surf swell island' as termed to make it sound interesting and to add the fun element by making them go through some interesting question answer sessions to test the understanding of the user [25].

### XIII. EFFECT OF CYBER-CRIME ON PURCHASE BEHAVIOUR

The consumer need to have trust on the website in order to disclose their credit card number and other sensitive private information while during the online purchases and this will depend on the preventive measures that the site has taken to override the cyber-crimes and ensure a sense of cyber safety, as indicated by the Fig. 2 above [31].

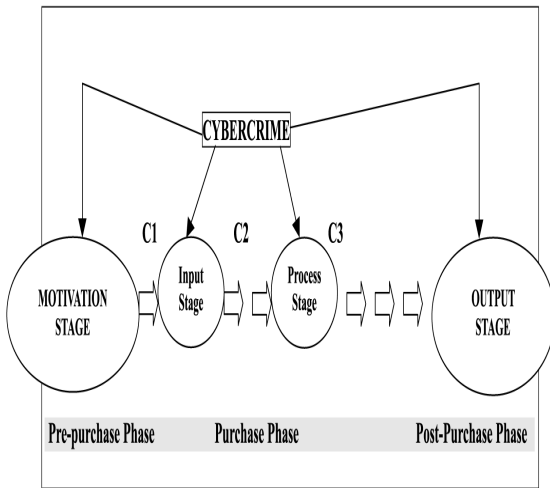


Fig. 2. Traditional consumer-buying model, illustrating at various points where cybercrime may negatively impact the purchase transactions [31].

The cyber criminals also resort to social engineering whereby they target innocent customers and trap them by mis-using their personal information that further demotivates users to make purchases online [32].

As Fig. 3 expatiates, users would feel less threatened and more motivated to buy if the measures taken to suppress cyber-crimes will enhance the security of the online transaction. On the other hand if ample measures are not taken to override these online risks, then, consumer confidence is challenged and they would not be feeling comfortable to make online purchases. The application of the above model will ensure that companies would take appropriate measures to suppress cyber-crimes in order to promote positive attitude towards online shopping as an alternative towards traditional shopping at a physical site [31].

In order to achieve sustainability in the market, e-business must strive to provide safe e-platforms with sufficient information to render a user-friendly and secure media for conducting online transactions and to maintain customers' satisfaction and loyalty. This is also vital to persuade the customers to purchase online by making

available, items that are not easily available in the physical stores in order to promote online businesses. Hence e-business should attempt to motivate consumers to do e-shopping by delivering high quality products and value-added services [33].

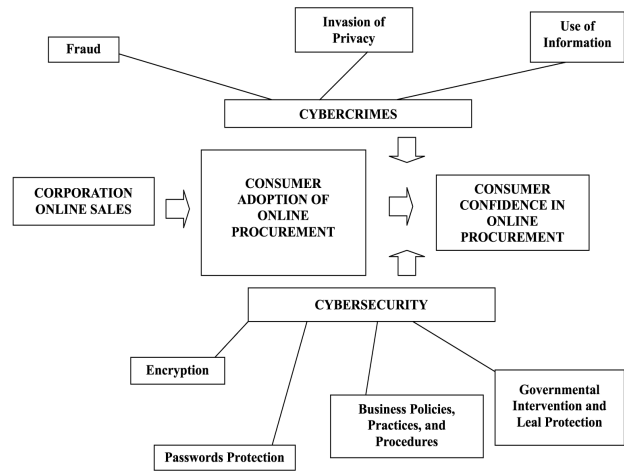


Fig. 3. Adoption model of online procurement, illustrating the balance of forces associated with cybercrime/cyber security in a force field approach [31].

### XIV. SERVICE QUALITY ATTRIBUTES PERCEIVED BY USERS

Six underlying service quality attributes perceived by Internet Purchasers were identified: reliability, access, ease of use, personalization, credibility, and security. Seven dimensions were uncovered for the Internet non-purchasers: security, responsiveness, ease of use, availability, reliability, personalization, and access. The dimensions of reliability, personalization, security, and access are important attributes in both the groups [34].

It has been observed that product and service fulfillment and reliability still remains a big challenge for online suppliers and most online consumers. (Jedd, 2000). A lack of internal and external coordination results in the failure of service fulfillment. The primary reasons reside in the lack of strong internal and external collaboration. Internal coordination deals with integration of Web sites with customer service operations and communication among different functional departments. External collaboration involves integration of supply chain partners (i.e., suppliers, packaging and shipping companies). Ideally, replenishment systems should be able to predict the demand for particular items and order them much ahead of time before they are consumed [34].

**Responsiveness**-Internet retailers do not have frequent real-time interaction with customers and resort to emails for their communications, and a recent study shows that 42% of the top-ranked Web sites took longer than five days to respond to a customer's e-mail inquiry, never responded, or were not accessible by e-mail (Wilcox, 1999) [34].

**Access**- Due to above situation of lack of responsiveness, it is better to provide both traditional and online communication channels such as chat rooms and bulletin boards are a necessity. (Berthon, Pitt & Watson, 1996)[34]. Ease of use is a prominent factor in determining customers'

decision to adopt a new information technology (Davis, 1989). Thus, Web-based stores should make it user friendly for customers by make it easy for customers to purchase by minimizing technical difficulties [34].

**Personalization-** Certain techniques such as a "rules engine" can be used to give use to personalization. In addition, to show a human face to customers, Internet companies may add personal support to staff telephones, answer e-mail, and train customers in the use of the Internet medium [34].

**Credibility-** Providing special rewards and discounts for consumers as promised often gives a sense of credibility and integrity to the customers [34].

**Availability-** The access to a range of products and services are otherwise limited in the traditional stores. Customers seek such limited range online due to the difficulty to get them in traditional stores [34].

## XV. DISCUSSION

The past studies have shown how perceived risks and trust influences a consumer's intention to purchase alongside with perceived usefulness and perceived ease of use. The new variables need to be accounted for along with the existing variables when looking at a consumer's intent to transact. We need to understand how uncertainty is a phenomenon as opposed to randomness. Trust cannot come without uncertainty and even though there are variables in uncertainty consumers are willing to be vulnerable to the system. Potential risks in e-commerce can be managed by avoidance, reduction of risks and vulnerability. This implies that businesses have to tally all the potential internet risks when it comes to creating an internet business, as well as the marketing risks just to secure and clarify all the information to the consumers. Reluctance to internet shopping is most influenced by trust to a web retailer and reputation of the web retailer is the most important in e-commerce. Perceived risks cannot be avoided as it is a subjective interpretation of a consumer but it can be overall decreased and clarified. A consumer is more likely to indulge in a transaction when he knows the risks, understands the usefulness and ease of use of a product and perceives the reputation of a retailer is good. Even when there is a slight doubt in the consumer's perception, he would most likely discard a transaction. When the potential risks in transactions are unknown to a consumer, it would not influence the intention to purchase.

Ease of use, reliability, communication, design element, security and appropriate coordination between online companies and their suppliers and logistics department is very crucial for encouraging customers to make purchases and remain loyal to the e-businesses. Consumers' decision to make a purchase also depends on personalisation of the web store and individual customer attention that they give to the customers by way of customer feedback, email, chat conversations etc. Customers can't find a particular range of goods in the brick and mortar stores, generally look for these items in the online web stores and that too at a better price offer. If this kind of accessibility is not met with, then customers get disappointed and discouraged from making online purchases. Design and layout is not a priority factor for physical traditional stores only, but, it is a priority for

online web stores as well. The web stores must consider good aesthetics for the store front and product layout and overall design of the products themselves if they need to motivate the customers to purchase online. Privacy is also important to consumers as they only want to invest their money on those transactions where they can afford to divulge their private confidential information like passwords, credit cards without the threat of mis-use of these information. The most crucial factor not to be ignored is that of internet security especially that of cyber crimes and how to do online shopping without succumbing at the hands of cyber crimes.

## XVI. CONCLUSION

This paper is based on web based research of journals, articles and e-books to review the approach to understanding the perception of consumers in e-businesses and gaining trust. Firstly to understand consumer perception we have to understand what the general perception to people is when they want to purchase something online. Since perception is a subjective matter, we need to deduce what are the risk factors, what people look for when classifying products what are the uncertainties and how uncertainties can influence decisions when it comes to trust. The bigger challenge is that when people cannot view or feel the products they want to purchase they are in a bigger dilemma when they want to transact. They may be awe struck by a certain product but their decision to purchase will solely rely on other factors such as reputation of a web retailer, the perceived risks involved in transactions, their own previous encounters with buying something online, the frequency of their purchases, etc. There is no avoiding the reputation but to gain a reputation, firstly protocols must be followed as much as possible in order to minimize the risk factors whether it is infrastructure based, legality based or process based. Once the consumers understand what are the risks involved, who would be responsible for certain cases, how they themselves can be alert on the risks and uncertainty (example the use of web certificates and clarity of warnings), how secure their information is – they can decide to the amount of trust they can set for a certain retailer and this would mean they would be more willing to be involved in online transactions.

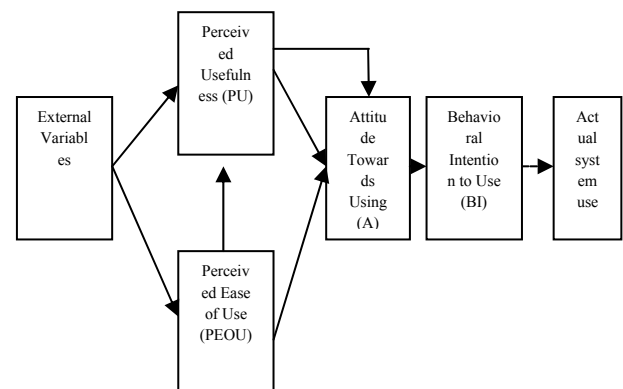


Fig. 4. Technology Acceptance Model [8].

It is also crucial to understand that just as brick and mortar stores use various elements such as aesthetics for

products, store front, store layout, customer relationship, accessibility, availability of a good product range, visibility, brand reputation, security and word of mouth recommendation, it is also vital for online companies to offer similar elements to woo the customers to convince them not only to make purchases but also to remain loyal to these companies. The challenges of privacy, security, cyber crimes etc would have to be resolved in order to win customers' attraction and persuade them to do online transactions. Various online technologies could be made use of to improvise the existing online shopping system in terms of design and aesthetics, accessibility, security and customer relationships etc and build a credible alternative mode of purchase to physical traditional stores.

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