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Msc- Human Centred Systems Project Report
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The study of trust factors in mobile commerce

Deepa Ashok Gangwani

Supervised by: Dr. Simone Stumpf

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Declaration

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Abstract

The main aim of this research was to understand how trust factors differ in the context of mobile commerce as compared to the traditional e-commerce scenario. Since the advent of smart phones and tablets, more and more interactions are going mobile now. Therefore, this research was carried out to understand what factors affect consumer behaviour when they are performing mobile transactions.

The findings of this research paper help in understanding how trust factors; in terms of cognitive cues, affective cues and virtual re-embedding of cues; affect a consumer's buying behaviour. This research also helps in deducing the correlations between mobile store trustworthiness and other variables like personality, gender, prior shopping experience and consumer disposition to trust (risk-behaviour).

Keywords: Trust in m-commerce, Cognitive cues, Affective cues, Virtual re-embedding of cues, Personality.

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1. Introduction

With the advent of iPhone, Blackberry and other smart phones, and the launch of tablets like the Ipad, there has been a tremendous growth in mobile commerce in the last couple of years, with most transactions being carried out “on-the-go”. As per the Forrester Research Group (2012), mobile commerce touched \$6 billion in 2011 and is expected to reach \$31 billion by the year 2016. Therefore it is beneficial for most of the companies to embrace mobile commerce and adopt reasonable mobile strategies in order to maximise the gain. M-commerce is an extension or a subset of e-commerce comprising mobile devices, applications, and wireless networks (Mogenahalli, et al., 2008). It can further be classified into transactional m-commerce which includes buying products or services, or non-transactional m-commerce which includes browsing products or services, or both.

However, even though the figures seem promising, a couple of factors turn out to be deterrents for mobile commerce adoption. One such significant deterrent is “consumer trust” which has been a bottleneck since the initial stages of B2C e-commerce as well.

With more interactions becoming technology-mediated, although not limited to e-commerce and mobile commerce, and replacing the face-to-face interactions, designing for trust becomes more challenging and a major concern (Riegelsberger et al., 2003).

A lot of research has been conducted in order to determine the trust triggers in the e-commerce context, with the most notable being the one developed by Riegelsberger and Sasse (2005). But since more and more interactions are going mobile now, researching factors affecting trust for mobile users, especially in the context of transactional websites, becomes a promising HCI research agenda.

More so, because the mobile commerce context varies from the e-commerce in many ways with the user experience being so different owing to smaller screen sizes, time constraints, readability issues, the context-of-use etc. In addition to that limited resources mostly for processing multimedia also greatly affects the building and development of trust in B2C e-commerce scenarios, as rightly agreed by Lee and Benbasat (2003) and Chae and Kim

(2003).

But besides the mobile user experience and context, this paper tries to validate the framework of trust (for e-commerce) developed by Reigelsberger for mobile e-commerce websites, more specifically focussing on the “transactional” websites. This could potentially help the vendors to understand and formulate strategies that can help overcome consumers’ lack of trust and call for a smoother mobile commerce adoption, for “transactional” websites. Also, consumers will, over time, rely on fewer physical (real-world) sources of information when making online purchasing decisions – thus the importance of trust triggers is only likely to increase over time.

Lumsden (2009) in his paper suggests that users will rely a lot less on physical sources of information that influences their buying behaviour which only increase the importance of finding out what triggers trust for users when purchasing on a mobile site. Also, as pointed out by Jia-bao and Yao-bin (2009), even though the importance of trust in mobile commerce is obvious, there is hardly any literature encompassing trust in m-commerce interactions.

Myoung-Soo , K., Jae-Hyeon, A., (2005) have emphasised the fact that trust is increasingly being recognised as a key facilitator of e-commerce in the academic world as well, because e-commerce and in turn m-commerce in the more current context requires sharing of personal and financial information, which is often sensitive and confidential in nature, among transacting entities. They even go on to re-iterate that one of the frequently cited reasons for not making a purchase online by customers is the lack of trust.

1.1 Objectives

Since trust is an important research issue and a big challenge for most online vendors, this research aims to enable future researchers to understand the trust based decisions that consumers undertake before making a purchase online on a mobile B2C website.

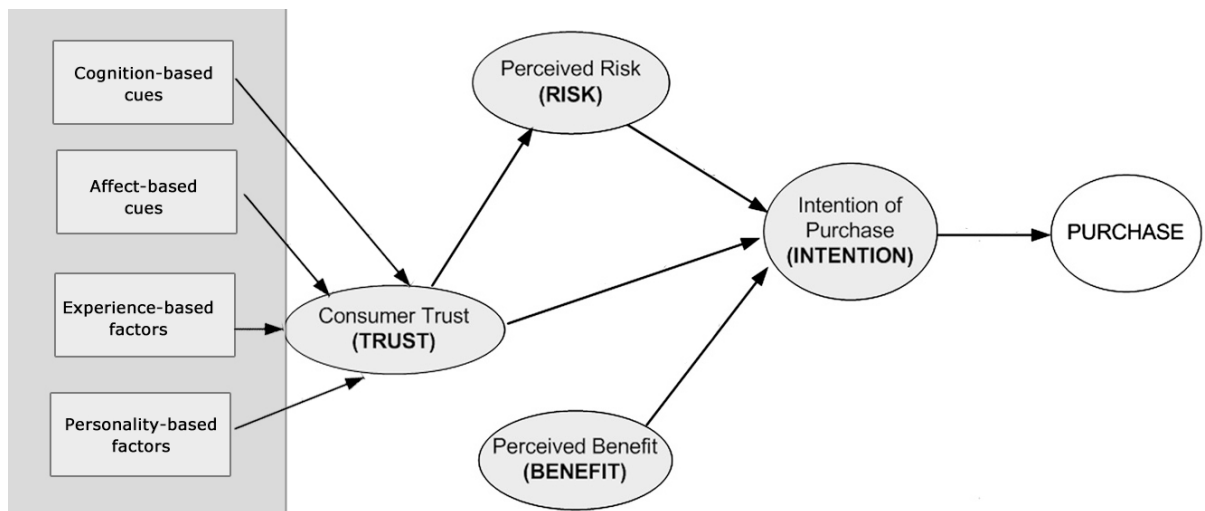
If compared with traditional commerce; where the development of trust is influenced by the customer characteristics, sales personnel, the company, and interactions between the company and the consumers; the same holds good in the mobile commerce context (Kim, D.J., et al., 2008). Kim, D.J., et al. (2008) have recognised four categories of antecedents that influence a consumer's trust and perceived risk which would be applied in this paper for m-commerce. These comprise the following:

- **Cognition-based** – these are related with consumers' observations and perceptions, viz., privacy protection, security protection, system reliability, information quality, etc.
- **Affect-based**: these are related to indirect interactions with the trustee, viz., reputation, presence of third-party seals, referral, recommendation, buyers' feedback, word-of-mouth, etc.
- **Experience-based**: are related to the consumers' personal experiences with the online vendors and online shopping in general, viz., Internet experience, e-commerce experience, etc.
- **Personality-oriented**: consumers' disposition to trust, shopping habits/style, etc.

This is supported by previous research that indicates that since *surface cues (cognitive and affect-based)* are important determinants of trust in e-commerce, in the context of m-commerce too they may be the major factors affecting trust.

To further add to that, as evident in the literature review, personality (Sutherland and Tan, 2004), and online-shopping experience of the consumer (Reigelsberger and Sasse, 2002) also has an effect on his risk-taking ability and thus affects a consumer's trust decisions.

Therefore this research would focus on the following *enhanced* theoretical model that was primarily adapted from the theoretical model developed by Kim, D.J., et al. (2008) and forms the basis for the research questions that form the core of this research paper:



Riegelsberger (2002) in his research used the concept of *re-embedding* (by using photographs, links to more expressive or synchronous media (email, telephone), and hints of personal accountability) to identify trust factors in e-commerce. This research uses a similar approach to identify initial trust triggers and whether the first impression of the interface after *re-embedding* helps in the establishment of trustworthiness and the resultant trusting behaviour.

However, while *virtual re-embedding* on mobile sites may increase a consumer's trust in the mobile site, it might severely affect the usability of the website owing to so many additions to the interface. This is because the mobile interactions are different from the desktop interactions with the major constraints being the screen size, time and the context of use. While purchasing on the mobile, most users find clutter free and easy to use interfaces owing to the device constraints covered in the literature review. This research paper would thus explore whether the usability and in turn a consumer's trust might be affected as a result of virtually re-embedded elements.

Therefore this paper aims at broadly answering the following **research questions:**

1. **Do cognition-based cues affect a consumer's trust in m-commerce transactions more than affective cues?**

2. **What effects do other factors like personality oriented factors, gender, mobile-shopping experience-based factors, have on a consumer's trusting ability?**
3. a. **Does *the presence* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site compared to *absence* of trust cues?**
b. **Does *virtual re-embedding* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site?**
4. **Does the risk-taking ability (disposition to trust) of a person affect a person's ability to trust m-commerce transactions and their intention to purchase?**

To answer the above the research questions, an experimental study would be carried out which would include

- the development of three different sites (conditions) for iOS and Android platforms accessible here:
 - No Cues - <http://www.digi-ninja.com/no>
 - All Trust Cues - <http://www.digi-ninja.com/wordpress>
 - Virtually re-embedded Trust Cues - <http://www.digi-ninja.com/portfolio>
- devising questionnaires to gather quantitative data and;
- development of an "investment game" which can be accessed here:
<http://digi-ninja.com/game/test-inv.php>
- conducting semi-structured interviews to gather qualitative data

Various statistical tests would be carried out in order to answer the above research questions (some of which include testing of the hypotheses). A limited amount of qualitative analysis would also be carried out in order to support the quantitative data analysis for answering these research questions.

2. Literature Review:

2.1. Trust

Trust has been examined by researchers from different perspectives, and therefore multiple definitions of trust exist in the available literature. Trust is an individual's reliance on another party under conditions of risk and dependence as pointed out by Currall and Judge (1995). In particular, Mayer et al. (1995) have defined trust as "the willingness of a party to be vulnerable to the actions of another party." In any B2C m-commerce transactions, there are relatively high degrees of uncertainties and risks involved, therefore, trust is critical in understanding consumer behaviour esp. consumer's intention to make a purchase in m-commerce.

Various factors affect trust-building in online commerce setting, therefore it can be argued that trust is multidimensional. A perception, that the trustee (the entity that is to be trusted), possesses the characteristics that reduces the uncertainty and risk involved for the trustor (entity who trusts) and benefit him in an online transaction is extremely important to create or maintain a potential or existing relationship, that could be business, social, or otherwise (Doney & Cannon, 1997; Mayer et al., 1995).

Riegelsberger and Sasse (2001) have mentioned trust as "*a device for reducing complexity*". As re-iterated by them, "trust depends on: (1) an individual's ability to trust, (2) conventions; and (3) cues of trustworthiness"

2.1.1 Initial Trust and Experiential Trust

Marsh and Meech (2000) proposed a concept that classifies trust into 2 stages - initial (or 'grabbing') trust and experiential trust. The initial trust emphasises on the fact that first impressions of interface design matter a lot (focussing more on user's spontaneous reactions to the interface) and if the user is turned off by the interface appearance, it is not possible to build a trustworthy relationship with an online vendor and push them towards higher levels of experiential trust.

They further add on saying that because it is difficult to build a trusting relationship in a virtual store as opposed to the real world (where there are real interactions with the customers describing the product and clarification of doubts the customer might have before making a purchase) the interface

should be built in a way that provides sufficient reasoning in order to enable the customer to trust and create a positive buying decision.

2.2 E-commerce/ M-commerce - A dis-embedding process

In other words, it can be said that in E-commerce, a socio-technical system replaces the existence of local context, wherein face-to-face interactions are important for carrying out a given transaction. Another noteworthy aspect to consider is the fact that e-commerce interactions are spread over time and space (the payment is made much before the product is delivered without the assurance of the delivery since there is no physical interaction), which makes it a pervasive process called *dis-embedding* (Giddens, 1990).

Riegelsberger (2003) further points out that because of this dis-embeddedness, e-commerce interactions become high risk interactions owing to specific risks related to secure technology and the risks that arise from the non-existence of an actual vendor (post-order-service etc). And as mentioned earlier, since mobile e-commerce is a subset of e-commerce, these risks are applicable to m-commerce entities as well.

2.2.1 Virtual re-embedding

Therefore, Riegelsberger and Sasse (2003) has suggested a technique called *virtual re-embedding* to increase trust in e-commerce interactions. Re-embedding simply means embedding cues that increase trustworthiness and compensate for the lack of face-to-face presence. The simplest form of re-embedding is adding human photos (happy faces of employees) to the interface, because it brings about a positive reinforcement and is closest to creating a personal context in the otherwise digital world.

2.3 The framework of trust (Riegelsberger et al.)

However, Riegelsberger (2005) also points out that while considering trust cues, it is important to consider both the symbols (created with an intent to build trustworthiness) like the photos of employees, trust seals, privacy policies, ratings etc.) and the symptoms (by-products of trustworthiness) like a large database of customer reviews that is an indicator brand loyalty. The challenge for virtual vendors in m-commerce therefore would be to focus on the symptoms, rather than symbols, of trustworthiness.

He created a framework of trust focussing on the concept of embedding to identify the contextual factors resulting in trust and trustworthy behaviour. He listed the intrinsic factors possessed by the vendor viz. ability and professionalism (a brand is capable of delivering as promised) and benevolence and integrity (a brand cares about delivering as promised).

J. Riegelsberger et al. / Int. J. Human-Computer Studies 62 (2005) 381–422

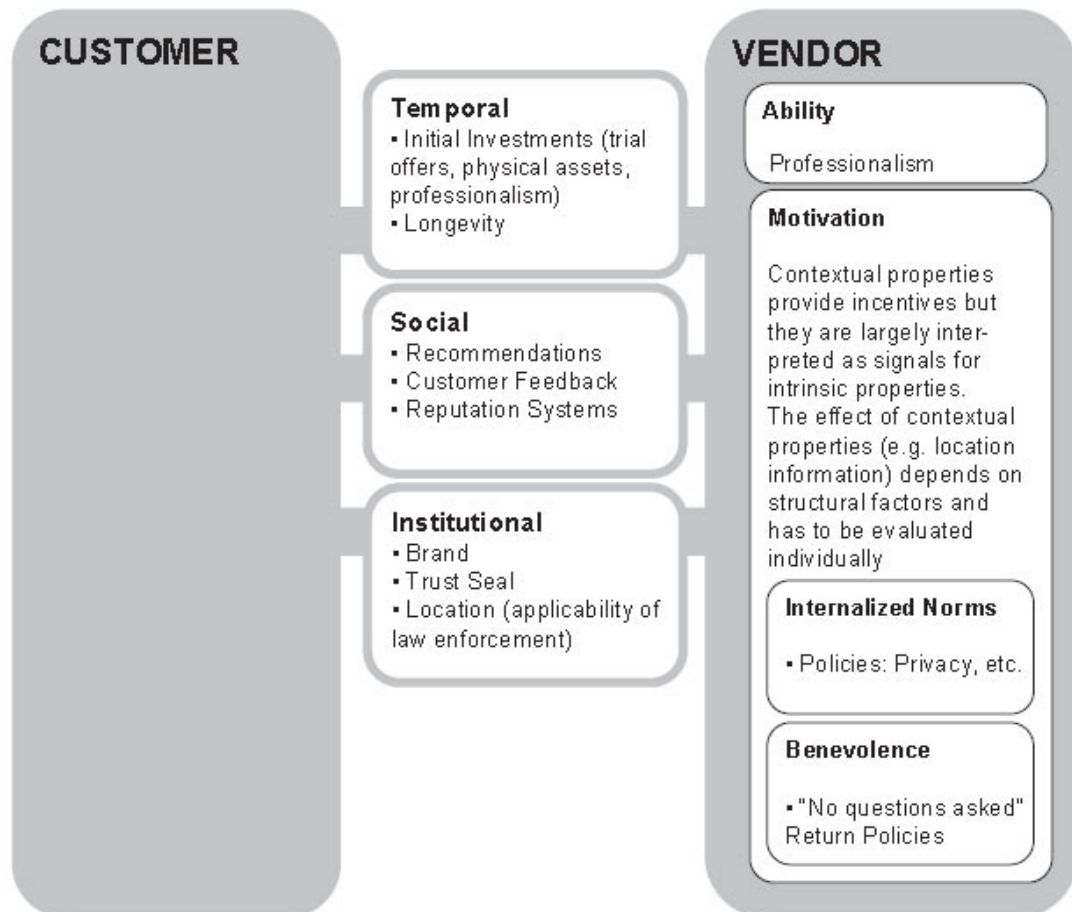


Fig. 8. The framework applied to trust in consumer e-commerce.

He recommends that the online vendors should focus on the intrinsic and contextual trust factors equally by using the concept of “embedding” to capture the contextual factors that contribute to trust and trustworthy behaviour. In summary, this concept holds that actors are perceived as more trustworthy when they are embedded in the social fabric through expectations of future encounters (temporal), through shared reputation (social), or through the influence of control agencies (institutional).

2.3.1. Temporal embedding

Temporal embedding is about building long-term on-going relationships with the consumer, which is an indicator of trust. It is marked by the presence of professionalism or association with a reputed brand, or can also be demonstrated by trying to create an interest in building a long term relationship by offering trial offers, loyalty schemes etc.

2.3.2. Social embedding

In this socially-networked online world, social embedding probably is the most significant trust builder influencing a user's buying decision. A positive reputation, with recommendations of friends and family plays a very important role in making an online purchase, so do customer ratings and feedback on the vendor's website. This highly reduces the perceived risk because people have feedback and recommendations to rely on making the situation more transparent and a vendor would rather not tarnish its image by not complying with the selling promises.

2.3.3. Institutional embedding

Institutional embedding which is evident by the addition of industry associations, trust seals etc. in the given interface.

In order to understand what makes for a trustworthy website in an m-commerce, it becomes important to evaluate the intrinsic and contextual trust factors as well as focus on both the trust symptoms and trust symbols, and considering the risks involved in conducting online transactions.

2.4 Cognitive trust and Affective trust

Riegelsberger (2002) also states that cognitive trust cues are important considerations affecting a consumer's trust decisions. A decision based on the good reputation of a vendor is an example of cognitive trust. The reputation precedes the vendor and the user already has a preconceived notion or an image of the trustworthiness of a vendor. On the other hand, he states that affective reactions, i.e. immediate reaction of liking or disliking something (eg: happy faces, usable interface) also affects human trust-decisions.

2.5. Purchase and Intention to Purchase

A consumer's intentions to purchase from a B2C m-commerce site is considered to be a significant predictor of their actual participation in the said m-commerce transactions. There is a significant relationship between the consumer intention and behaviour based on the assumption that most of the rational decisions that consumers make are based on the information that is available to them. Therefore, their behavioural intention to purchase (or not purchase) is the immediate determining factor that results in their actual behaviour of making a purchase. (Kim, D., et al., 2008)

Also, Riegelsberger, J., and Sasse, M.A., (2001) have thrown light on how a consumer's prior knowledge and online shopping experience affects their risk-taking ability and influences their trust-based decisions of purchasing from an online vendor. However, whether this holds good in the m-commerce context as well would be an interesting area to explore and forms a part of this research paper.

2.6. Risk Perception and Disposition to trust

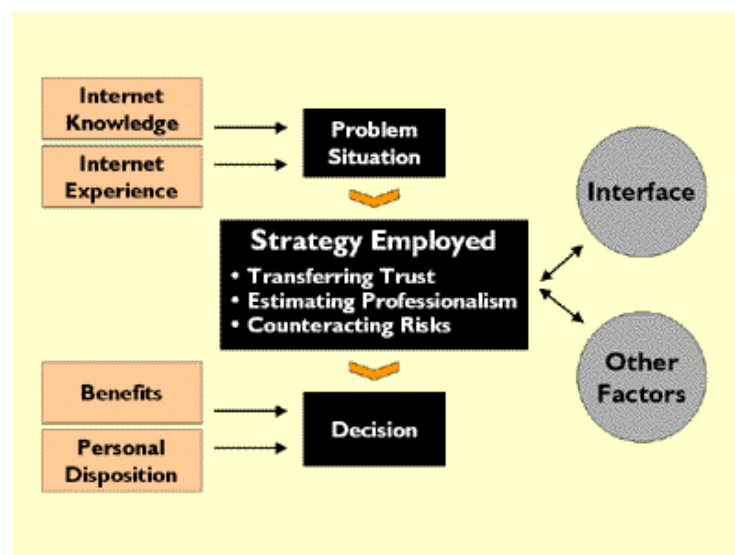
Beldad, A., et al., (2011) have defined risk as the "potential for the realization of unwanted, negative consequences of an event". They also indicate that risks can be split into three different components: (1) the magnitude of a loss or an injury; (2) the chance of a loss or an injury; and (3) the exposure to a loss or an injury (Beldad, A., et al., 2011).

Trust and risk are inter-related and trust enables people to take risk (McAllister, D. J., 1995). In other words, the trust-building helps in reducing a consumers' perceived risk of online purchasing. Thus, it can be said that a consumer's risk perception is inversely related to his trust in the online transaction carried out by him.

Beldad, A., et al. (2011) also posits that a consumer's risk-taking ability and risk perceptions are not always a result of rationalised thinking. It may so happen that users with high levels of internet experience may choose to engage themselves conveniently in computed-mediated transactions and interactions, in spite of knowing about the potential risks involved, just because they are used to or comfortable carrying out online transactions. However, as argued by Yao et al. (2007), the relation between the risk

perception and the consumers' level of Internet experience in online transactions could be the result of the fact the higher the awareness and knowledge about the internet, the higher is the awareness of privacy concerns and this in turn leads to higher awareness of the online privacy threats that are known to such users.

In addition to that, Riegelsberger, J., and Sasse, M.A., (2001), have also modelled an e-consumer's decision making model wherein they state that the consumer's decision to buy or not to buy ultimately is affected by 1.) online vendor's performance, most likely their reputation 2.) the perceived benefit. 3.) their personal disposition to trust, i.e. their risk-taking ability. They state that consumers who are inexperienced with online shopping are more likely to transfer trust compared to experienced ones. They are likely to trust the online vendors recommended by friends or family or one's who are known to have a great reputation in the online marketplace. On the other hand experienced shoppers only consider specific risk, mostly related to the fulfilment of the order, they more specifically look for a perceived benefit and if they find one, they are most likely to shop with vendors who are look less professional or are not that reputable.



2.7. Perceived Benefit

Kim, D.J., et al. (2008) define perceived benefit as "a consumer's belief about the extent to which he or she will become better off from the online transaction with a certain Website". Research studies show that the

consumers purchase online owing to the perception of the benefits they have regarding online shopping, for example - time and cost savings, convenience, etc. as compared to purchases made through a traditional mode of shopping. Therefore, where perceived risk is a major hindrance for the success of an m-commerce website, a consumer's perceived benefit could actually boost the confidence of online consumers in the context of m-commerce and they more likely they are to make online transactions because of their increased trust through perceived benefits.

2.8. Personality and Trust

There are various factors external to the interface that affect trust, the significant one being a consumer's propensity to trust or disposition to trust. And individual trait where there is a general willingness to trust others based on one's background, life experiences, and personality types is what constitutes *propensity to trust* (Jia-bao and L.Yao-bin, 2009). Research indicates that there is a direct correlation between the individual's propensity to trust and their formation of trust in e-commerce context. A multi-dimensional trust model developed by Sutherland and Tan (2004) indicate that an individual's personality type does affect their ability to trust, for example, people who are extroverts and with a more open-mind, would have a higher disposition of trust than people who exude negative emotional states.

Lumsden, J. and Mackay, L. (2006) in their paper have referred to four personality types :

Popular Sanguine: These are extroverts, high-energy, optimistic people. they like to make quicker decisions and are likely to take more risks compared to other personality types.

Perfect Melancholy: These are introverts, peaceful and pessimistic people, who think a lot. They tend to negotiate a lot and base their decisions on facts and likely to take lesser risks because they like to deliberate a lot before coming to a conclusion.

Powerful Choleric: These people are again extroverts, optimistic and they believe in getting things done. Quite decisive, they however tend to gather sufficient information before jumping to a conclusion.

Peaceful Phlegmatic: These are introverts, pessimistic, but quite easy-going and friendly people, who need to feel safe before they make a decision.

According to them, the extroverted and optimistic personalities viz. **Popular Sanguine and Powerful Choleric returned the highest store trustworthiness** ratings, on the other hand, **the introverted and pessimistic Perfect Melancholy personalities returned the lowest** trustworthiness ratings for e-commerce stores. This study aims to understand if this holds good in the context of m-commerce as well.

2.9 Gender, Risk and Trust

Previous research studies show that **males trust more than females**, and that women are more trustworthy than their male counterparts. It is also evident that males show stronger relationship between expected return and their trusting behaviour as compared to females (Buchan, N. R., et.al., 2008).

A lot of literature review relevant to gender studies have also found that males are more risk-seeking in general, compared to females.

Halko, M., et. al., (2012) in their studies have mentioned that women are less likely to participate in the stock market, and even when they do, they take fairly lesser risk compared to men, women are more risk-averse.

This is further supported by Charness, G., Gneezy, U. (2012), wherein they state that "women are more risk-averse than men" is a common stereotype, and their research findings suggest that women make smaller investments when the risk is high, compared to men, and so they appear to be financially more risk-averse.

2.10 Mobile Aesthetics and Trust

As pointed out by Lee and Benbasat (2003), that smaller screen sizes of mobile website can prove to be a major hindrance in trusting a vendor's website on a mobile device, Sarker and Well's work (2003) suggest that a website's aesthetic appeal can go a long way in overcoming the physical limitations of the mobile device that hinder trust development.

2.11 M-commerce Context

While talking about m-commerce, two factors significantly affect the consumer purchase behaviours - **the mobile context of use** (mobile setting) and **the mobile device constraints**.

The mobile context of use can be broken down into three aspects:

- **spatiality** i.e. the ability of the users to roam anywhere using their mobile devices and encompasses the mobility of the users and their mobile devices,
- **temporality** which implies their ability to gain instant access to the internet while performing other tasks in the periphery, and
- **contextuality** which focuses on the environment in which users conduct their mobile tasks, such as the degree of interaction with others.

On the other hand, mobile devices constraints could primarily include limited processing power, low bandwidth capacity, limited screen sizes, constrained input/output devices. Therefore, the attention should be paid for developing the m-commerce interface in a manner that it compensates for the limited visual display of these mobile devices. (Lee & Benbasat, 2003).

As quoted by Lee & Benbasat (2003), "the mobile setting and device constraints suggest successful e-commerce interface design does not necessarily translate to successful m-commerce design. It is therefore imperative to improve the design elements of m-commerce interfaces to foster consumer adoption."

In addition to that Nielsen (2009) has indicated that websites that were designed specifically for mobile devices had a success rate of 64%, compared the "full" sites that were designed for desktops but accessed through mobiles with a success rate of 58%.

Thus, usability is an important factor which is largely affected by mobile design aesthetics. It has been further argued by Li., Y., & Yeh, Y. (2010) that design aesthetics are important to develop trust in online transactions, and the virtual experience that a consumer has on the mobile website can determine whether he and purchases or leaves.

3. Method

3.1 Research Overview

This research aimed to study the trust factors in mobile commerce (m-commerce) taking into consideration affective cues, cognitive cues and virtual re-embedding of cues into the mobile interface. The fundamental idea was to answer the following research questions:

1. Do cognition-based cues affect a consumer's trust in m-commerce transactions more than affective cues?
2. What effects do other factors like personality oriented factors, gender, mobile-shopping experience-based factors, have on a consumer's trusting ability?
3.
 - a. Does *the presence* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site compared to *absence* of trust cues?
 - b. Does *virtual re-embedding* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site?
4. Does the risk-taking ability (disposition to trust) of a person affect a person's ability to trust m-commerce transactions and their intention to purchase?

3.2 Experimental Design

For the purpose of this research an experimental design setup was used which primarily included: a walkthrough of online stores (3 screen mocks) while performing the given tasks comprising 3 different mobile conditions

1. No trust cues
2. All trust cues (cognitive & affective) and
3. Virtually re-embedment of certain trust cues

Furthermore, the following were undertaken as a part of the research setup viz.,

- Conducting a semi-structured interview was to determine the trust factors that affect the purchase of buying a product on a mobile site.
- Determining the trustworthiness of each of the above stores, by making the participants fill in the required questionnaires and rating each store on different factors.
- Ranking cognitive v/s affective cues in order to determine what makes the consumers trust the online store more in the mobile context.

- Using an “investment game” approach in order to determine the risk-taking ability of the participant and co-relating that to their risk-taking ability (disposition to trust) and in turn their buying decisions for screens containing all trust cues.
- Determining the personality type and co-relating that to their trustworthiness score for store that contained all the trust cues.

3.2.1 Participant Recruitment

For this research a group of 17 participants were recruited, mostly from personal and professional contacts and were booked in using the slots available from the period 15th Sep to 5th Oct. They were in the age group of 18-35 years, comprising 9 males and 8 females. The participants mostly consisted of students from different backgrounds like medical and engineering sciences and working professionals, mostly from IT, Marketing and HR, and were made to fill out screener questionnaires.

Suitable participants **using iOS (iPhone) and Android (Samsung, Sony, LG, Google)** and with some amount of e-commerce experience were filtered to conduct the experiment with.

3.2.2 Experimental Procedure

The research was conducted over a period of three weeks with no more than 4 participants on any given day. Out of the 17 participants' interviews, **2 participants were considered as pilots (P1 & P2)**, while the rest (**P3 to P17**) followed a structure which was improved upon and finalised upon after conducting the first pilot interviews.

The procedure briefly was divided into 3 phases:

Phase 1: Welcoming the participants, filling up of screener questionnaires and conducting tasks on 3 different mobile online stores, representing 3 different experimental conditions.

The participants were first made comfortable and thanked for participating in the study. They were then asked to fill up a **screener (Pre-Interview) questionnaire (Appendix B)**, covering questions about their:

- Age

- Gender
- Type of Mobile handsets used
- Type of Mobile Platforms used – Android or iOS.
- Mobile Internet usage
- Previous desktop shopping (e-commerce) experience
- Previous mobile shopping (e-commerce) experience

A basic "**filtering**" criterion was set in order to ensure the right participants were recruited for the research, which included:

- Ownership of at least one smart phone with iOS or Android platform.
 - A minimum of 3 months of e-commerce experience
 - Purchase of at least one e-commerce product of minimum 100 INR in value.
 - Availability of at least a GPRS, 2G or 3G service
 - Some mobile internet browsing experience, including use of email, installing apps, games, sports, shopping etc.
 - Some mobile shopping experience or willingness to purchase from a mobile site (if no mobile shopping experience)
- a. If they fulfilled the desired criteria, they were then asked to fill up the **Informed Consent Form (Appendix C)**.
 - b. Post-that, the *filtered* participants were asked to conduct the two **tasks (Appendix D)**, for making an online purchase for all 3 conditions (using 3 different mobile sites in a random order):
 - c. Once the tasks were completed:
 - The participants were asked which store out of the three would they trust more (One with **no cues**, **all cues**, or **virtually re-embedded cues**) and why.
 - They were then asked to fill up the **Trust Rating questionnaire (Appendix E)** and rank the cognitive and affective trust cues shown below, based on their task performance.

Cognitive Cues	Affective Cues
<ol style="list-style-type: none"> 1. Information quality 2. Interface Design 3. Branding 4. Privacy Policies/Disclaimers 5. Refund Policies 	<ol style="list-style-type: none"> 1. Trust Seals/ Third party Certifications 2. Customer Care Employee's email/contact number 3. Customer Care Employee's Pictures 4. Online Store's Location 5. Online Store's contact details 6. Customer Reviews 7. Customer Ratings 8. Recommendations from friends & family

- A brief post-task **semi-structured interview** was conducted in the end with the participants, broadly covering the following aspects:
 - What makes you trust this (the chosen) online store?
 - What are the things that you would consider before making an online purchase from a mobile site?
 - Do you rely on recommendations from family and friends before buying from a particular site?
 - Would you trust and buy from a site that's fairly new, and not recommended by anyone to you, but still gives you a good user experience?
 - Have you ever been cheated before making a purchase online?
 - Or if the product didn't turn up the way you expected and you got your money back, would you still trust the site and re-visit it and make an online purchase?
 - Do you ensure there are 3rd party seals/certifications before making an online purchase?

d. Post-task trustworthiness questionnaire (*Appendix F*)

Once the semi-structured interview was conducted, the participants were then asked to fill up the trustworthiness questionnaire that asked them to rate all 3 stores that they performed the tasks on and rate various factors like **Store Trustworthiness, Store Privacy, Store Security, Perceived Risk Attitude, Third Party Seals/Certifications, Information Quality, Perceived Benefit, Intention to purchase and lastly, Consumer disposition to trust**, on a 1-5 Likert scale, where 1 implied Strongly disagree and 5 implied Strongly Agree.

Phase 2: Instructing the participants about the *investment game* and asking them to play the game on the computer and recording their investment and money earned details for each round in the given investment sheet (*Appendix G*)

The game code can be accessed from this url:

<http://digi-ninja.com/game/test-inv.php>

The database values for each player were reset to 10 units before the start of every game.

The game was kept very short and simple. The participant was termed Player 1 and had been assigned 10 units (Rs.100) to invest, where 1 unit = Rs. 10 and make money through this investment game. Player 2 was the computer who also receives 10 units to start with. The participants were asked to transfer none, some or all of Rs. 100 to Player 2 i.e. the computer. Each unit that they transferred to Player 2 tripled in value for Player 2. So for example, if they transferred 2 units (Rs. 20) to Player 2, Player 2 received Rs. 60 units (2x3) i.e. Rs. 60.

They were asked to request money from Player 2 once they invested some amount, and Player 2 returned any amount between 0 , and the balance left with plus the amount back to Player 1. Player 1 was asked to invest for a maximum of 10 rounds and asked to stop at any given point in time should they feel they have made a lot of money or lost a lot of money.

In the end, **their pay-off was calculated = 10 units - the units you transferred + the units received from Player 2.**

All the actions of the participants on the screen were recorded using te software from screen-o-matic.com. All the details were noted down in the investment chart for each of the rounds they played.

Phase 3: Filling of other non-task related questionnaires like Personality Plus (Appendix H).

As discussed in the literature review, personality of a person does affect his/her trust-making abilities and the extroverted and optimistic personalities viz. Popular Sanguine and Powerful Choleric returned the highest store trustworthiness ratings. On the other hand, the introverted and pessimistic Peaceful Phlegmatic and Perfect Melancholy personalities returned the lowest trustworthiness ratings for e-commerce stores.

Therefore in order to verify the same for mobile stores, and answer the research question related to personality and trust, it was important to gauge what personality group does a participant belonged to. Therefore, a questionnaire was adapted from Florence Littauer's Personality Plus: How to Understand Others by Understanding Yourself (Littauer, F, 1995), which was given to the participants at the end of the study, and a score was calculated for each participant identifying them as either **of the four personality types - Popular Sanguine, Powerful Choleric, Perfect Melancholy or Peaceful Phlegmatic.**

3.2.3 Reducing Experimental Biases

A "within—group" approach was adopted in this experimental design. As Lazar et al. (2010) has pointed out that a "within-groups" design has a probability of learning affects; it is important that the design calls for an approach that counter-affects the same. Therefore, this was resolved with the help of randomisation of the 3 experimental conditions using a Latin Square design approach. In order to achieve that, a total of 15 participants were divided into groups of 5, wherein each group was presented with one of the 3 orders of screens in a 3x3 Latin Square Matrix as shown below:

<p>A</p> <p>Condition 1: (Virtual re-embedding)</p>	<p>B</p> <p>Condition 2: (All cues)</p>	<p>C</p> <p>Condition 3: (No cues)</p>
<p>B</p> <p>Condition 2: (All cues)</p>	<p>C</p> <p>Condition 3: (No cues)</p>	<p>A</p> <p>Condition 1: (Virtual re-embedding)</p>
<p>C</p> <p>Condition 3: (No cues)</p>	<p>A</p> <p>Condition 1: (Virtual re-embedding)</p>	<p>B</p> <p>Condition 2: (All cues)</p>

3.2.4 Content Analysis Method

Content Analysis technique (Preece, J., et al., 2007) was the method adopted for analysing qualitative data, which involved categorising the data into different categories and determining the frequency of occurrences of those categories in the data collected. Using this technique, the transcribed data collected from the interviews was analysed and broken down first into **major categories** viz., Affective Cues, Cognitive Cues & Disposition to trust

And then subsequently into **minor categories (as shown in Appendix O)** and **category codes** were allotted for each category which was then assigned to various keywords in the transcriptions.

The **qualitative data analysis results were limited to the data collected from only 13 participants (P3 and P6 to P17), owing to technical glitches that were experienced while recording the interviews.** For 2 participants, P4 and P5, the audio stopped working and hence only the video of them performing the tasks could be recorded. Therefore, the interview data of these participants had to be discarded and not considered when deriving results for qualitative data. However, all the quantitative data for all 15 participants was collected successfully and used for analysis purposes.

The category codes were then assigned to **each relevant keyword /keywords (underlined data as shown in Appendix Q)** for each line in the transcribed data and **frequency of each was determined** and assigned as the "Total Score" (**as shown in Appendix P**)

The Total Score was calculated as shown in Appendix F. Each keyword was assigned a score of 1, which was then assigned to the respective category. Therefore, the total score was derived at by summing up all the keyword scores for all 13 participants.

Total score (as shown in Appendix P) = Category Score (keyword count) for 13 participants

This was done for each participant and an aggregate score (total score) was calculated for each category. The average score was calculated as follows:

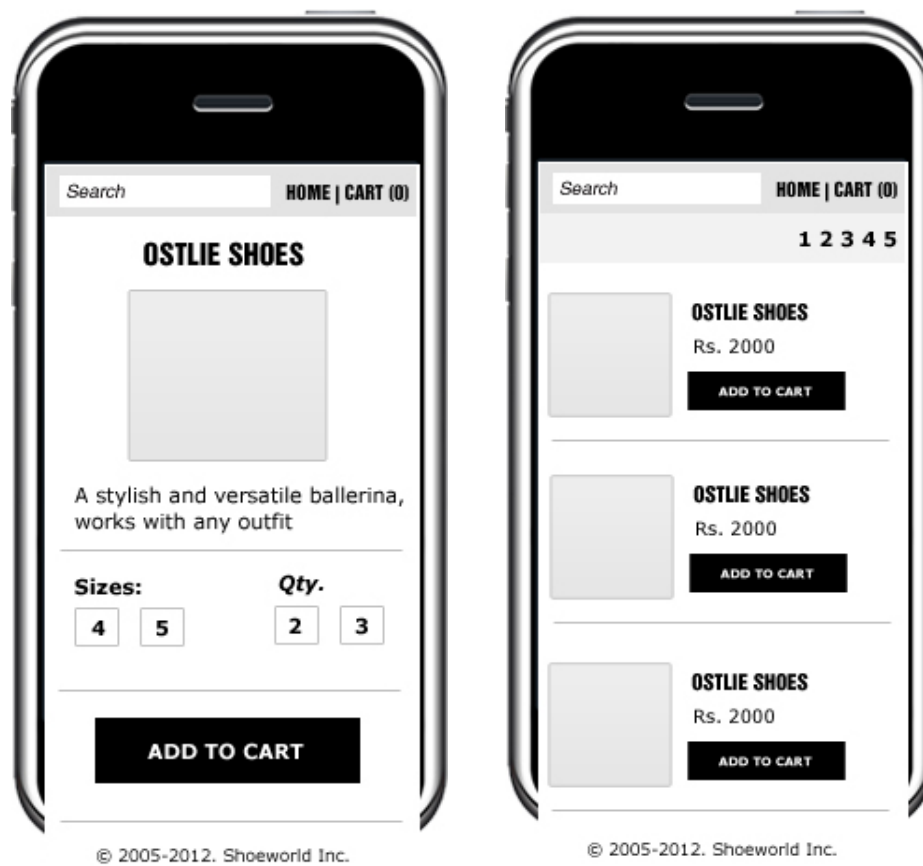
Average score (as shown in Appendix P) = Total Score/Total no. of participants (13)

3.3 Design and Development of mobile sites for 3 conditions

In order to perform tasks based on 3 conditions it was decided to prepare 3 screens each representing one experimental condition viz., No Trust Cues, All Trust Cues and Virtually re-embedded Trust Cues. The entire process from the design to the development to the implementation took about two weeks' time.

3.3.1 Wireframe Design

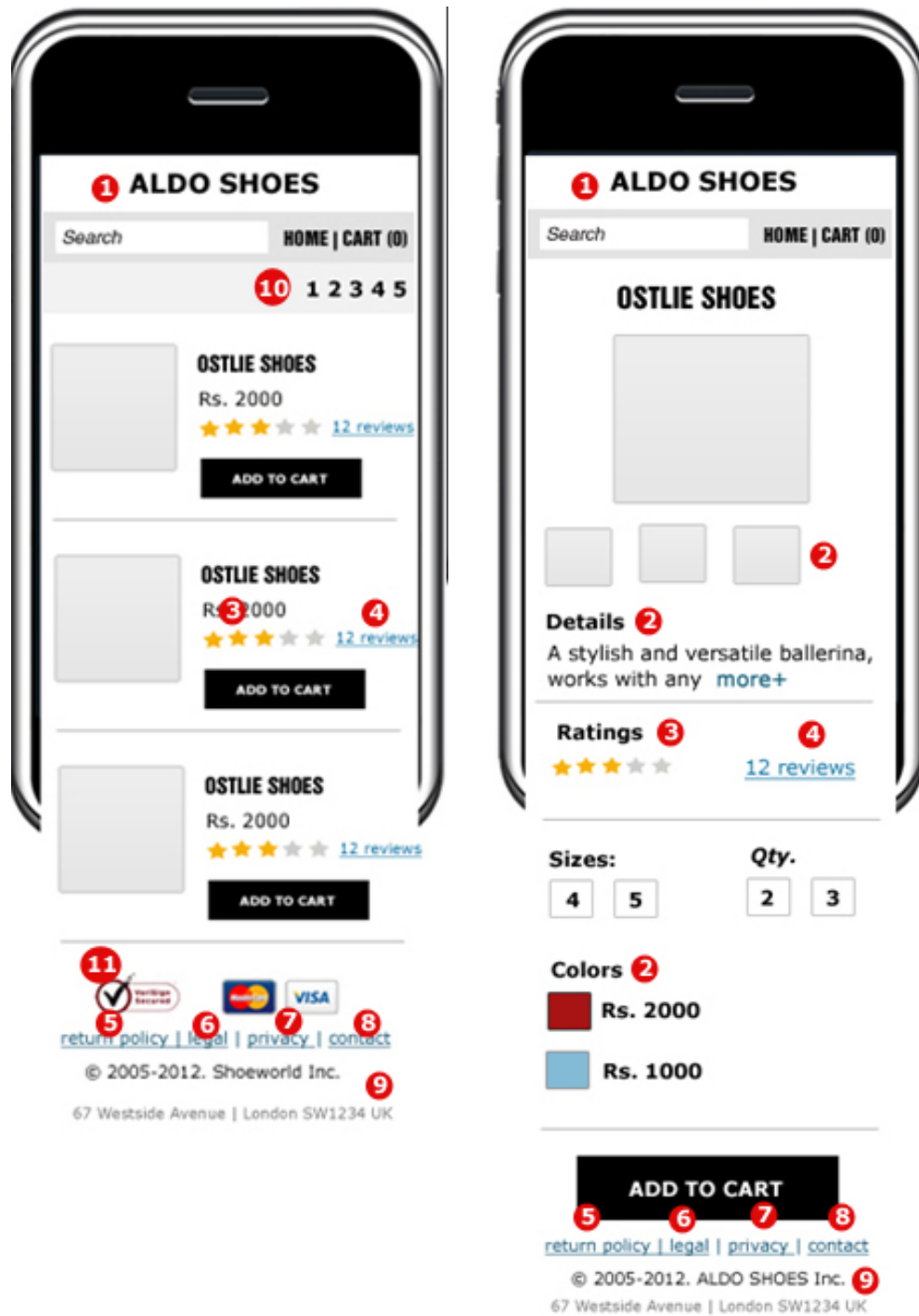
Wireframes were designed prior to the development of the site, in order to ensure that the development was completed at a faster pace since the design was in place beforehand.

A. No Trust Cues – Screens

B. All Trust Cues – Screens

Annotations (All Trust Cues – Screens):

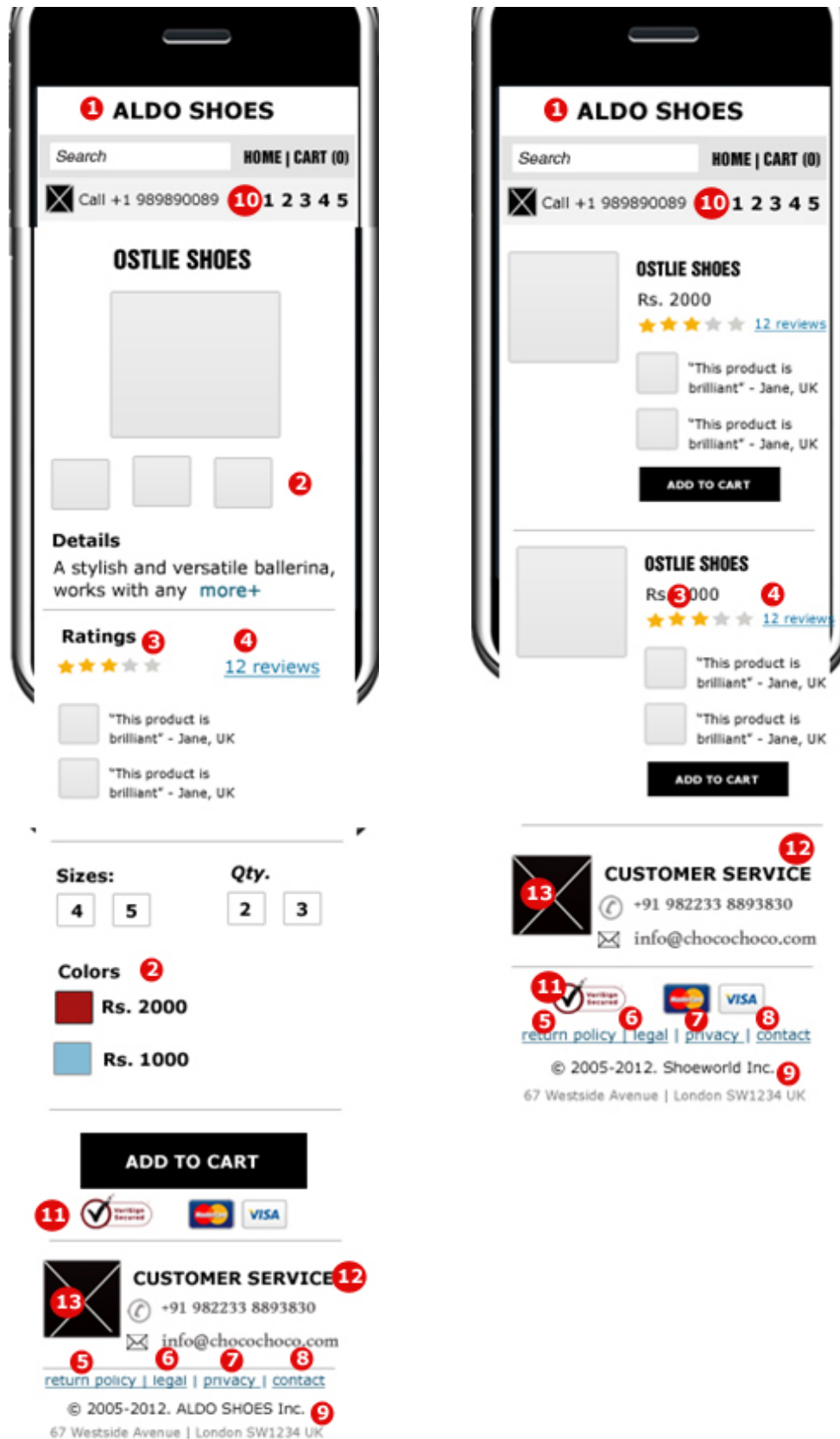
1. Branding
2. Information quality
3. Customer Ratings
4. Customer Reviews
5. Refund Policies
6. Disclaimers
7. Privacy Policies
8. Online Store's contact details
9. Online Store's Location
10. Interface Design
11. Trust Seals/ Third party Certifications
12. Customer Care Employee's email/contact number
13. Customer Care Employee's Pictures



C. Virtually re-embedded Trust Cues – Screens

Annotations (Virtually re-embedded Trust Cues – Screens):

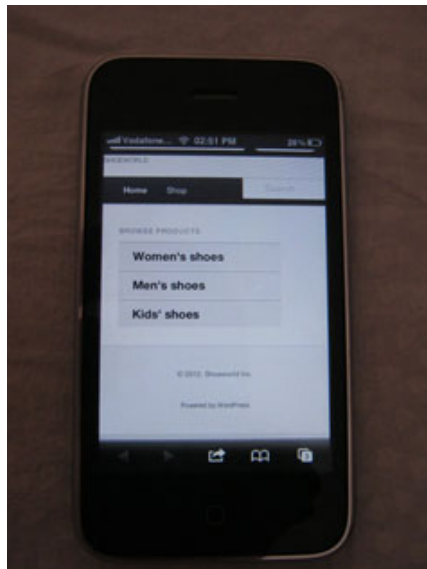
1. Branding
2. Information quality
3. Customer Ratings
4. Customer Reviews
5. Refund Policies
6. Disclaimers
7. Privacy Policies
8. Online Store's contact details
9. Online Store's Location
10. Interface Design
11. Trust Seals/ Third party Certifications
12. Customer Care Employee's email/contact number
13. Customer Care Employee's Pictures



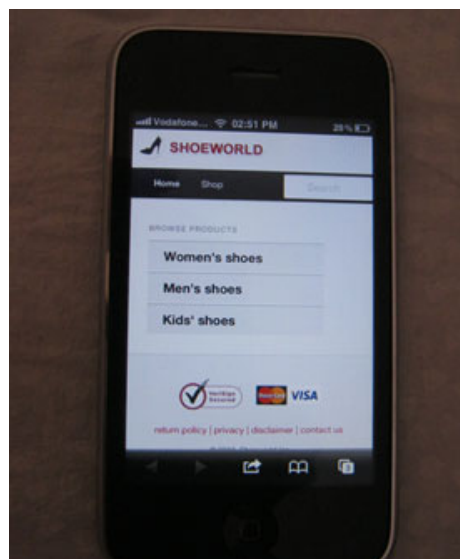
The site was developed and powered by the Wordpress platform using the Twentyeleven theme, which was custom built to ensure it was compatible with the iOS and Android Platforms. The stores were designed to sell shoes categorised into Women's shoes, Men's Shoes and Kids' Shoes. However, the store was purely a demo store developed for the purpose of this research.

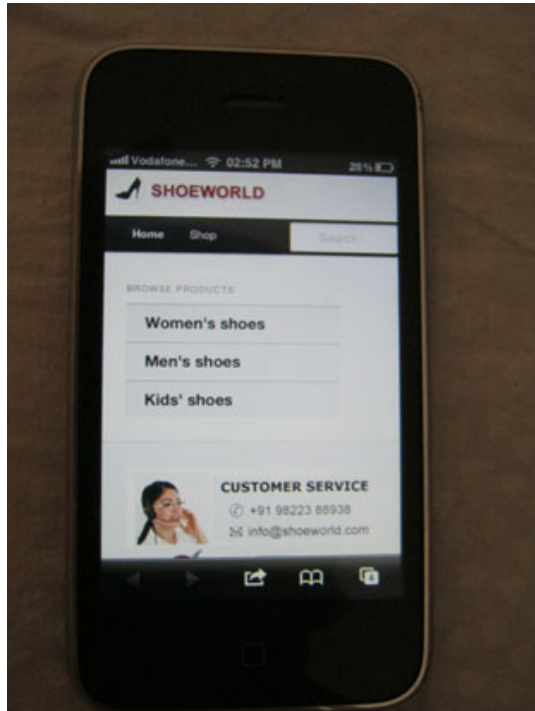
All 3 stores/mobile sites were hosted on a personal server, www.digi-ninja.com and the following urls were given to the users to browse through the sites **(to be viewed strictly on iPhone or Android phones)**:

A. No Cues - <http://www.digi-ninja.com/no>



B. All Trust Cues - <http://www.digi-ninja.com/wordpress>



C. Virtually re-embedded Trust Cues - <http://www.digi-ninja.com/portfolio>**3.4 Equipment Used**

In order to make the participants perform the tasks a mobile phone (Android or iPhone) was used and in order to video-tape the participant actions and audio-tape their comments, the following device was made using a plastic/wooden stand and a webcam – iBall C8.0 Face2Face version 3 with a built-in USB microphone (audio) device. The video and audio was recorded in the **.avi format** with a video resolution of 640 x 480.

**Mobile cam-recording device****Mobile cam-recorder**

3.5 Design and Development of the investment game

Since the researcher had development skills limited to PHP, HTML and Javascript, an investment game was devised based on the investment game concept developed by Chaudhuri, A., Gangadharan, L. (2007).

The game was created using PHP 5.4.3, MYSQL 5.5.24 and Javascript. The game code can be accessed from this url:

<http://digi-ninja.com/game/test-inv.php>

The database comprised of 2 players - Player 1 and Player 2 (computer) and the values for each player were reset to 10 units before the start of every game.

The game was kept very short and simple. The participant was termed Player 1 and had been assigned 10 units (Rs.100) to invest, where 1 unit = Rs. 10 and make money through this investment game. Player 2 was the computer who also receives 10 units to start with. The participants were asked to transfer none, some or all of Rs. 100 to Player 2 i.e. the computer, using the **INVEST button**. Each unit that they transferred to Player 2 tripled in value for Player 2. So for example, if they transferred 2 units (Rs. 20) to Player 2, Player 2 received Rs. 60 units (2x3) i.e. Rs. 60.

They were asked to request money, using the **REQUEST MONEY button**, from Player 2 once they invested some amount, and **Player 2 returned any amount between 0**, and the balance left with plus the amount back to Player 1 **(as shown in the image)**

The number was randomly generated using an array of the amount that was given to player 2 by Player 1.

Investment Game Instructions

The game is very short and simple. Let's say you are Player 1 and have been 10 units (Rs. 100) to invest, where 1 unit = Rs. 10 and make money through this investment game. Player 2 is the computer who also receives 10 units to start with. You have the possibility to transfer none, some or all of Rs. 100 to Player 2 i.e. the computer. Each unit you send will be tripled in value. So for example, if you send 2 units (Rs. 20) to Player 2, Player 2 will receive Rs. 60 units (2x3) i.e. Rs. 60.

Player 2 can choose to send any amount between 0 and the amount tripled plus the balance left at the end of each round (in this case Rs. 160) back to you. You can choose to re-invest the money if you like or stop the game. So if Player 2 chooses to return Rs. 30 (3 units), you will now have Rs. 80 + Rs. 30 = Rs. 110 (11 units)

You can choose to transfer upto a **maximum of 10 times** in this game. The game stops when you choose to stop or at the end of 10th transfer, whichever is earlier.

In the end, **your pay-off = 10 units - the units you transferred + the units received from Player 2.**

Your Current Balance (in Units):

BALANCE (UNITS) LEFT WITH PLAYER 1 → **5**

NO. OF UNITS INVESTED BY PLAYER 1 → **Invest**

Request Money

NO. OF UNITS RETURNED BY PLAYER 2 (COMPUTER) ← **0**

The page at localhost says:
Money Returned Back: 0
OK

Player 1 was asked to play this game for a maximum of 10 rounds and asked to stop at any given point in time should they feel they have made a lot of money or lost a lot of money.

In the end, their **pay-off was calculated = 10 units - the units you transferred + the units received from Player 2.**

The game basically monitored the risk-averseness or the risk-taking ability of each participant. As supported by literature review, the underlying logic behind the game was, that the more money a participant made, **a risk-taking** person would invest more money he/she in the further rounds. On the contrary, a **risk-averse** person would stop and not go further if he has made enough profit in the first couple of rounds.

Therefore, in order to categorise the participants based on their risk behaviour viz., risk-averse, risk-neutral and risk-taking, it was decided to consider a 50% cut-off for :

- frequency of rounds played (higher the number of rounds played, higher is the risk-taking ability).
- amount of units re-invested after earning 0 returns (therefore higher the investment, higher is the risk-taking behaviour. This is supported by literature review (Chaudhuri, A. and Gangadharan, L., 2007),

that higher the gains and higher is the investment made (safer option), the person is considered risk-averse and if lower the gains and still the investment is high, the person is considered to be a risk-taker (riskier option)

Therefore, if the participant played less than 5 rounds, he was deemed **risk-averse**, if he played just 5 rounds, he was considered **risk-neutral** whereas anyone who played more than 5 rounds was termed as someone with a **risk-taking** behaviour.

Similarly, for a person investing more than 50% of the total units assigned to him/her (5 units), he was considered to be **risk-taker**, less than 50% units of investment was **risk-averse** and just 50% was considered **risk-neutral**.

4. Quantitative Data Analysis, Results and Discussion

Treatment of quantitative data

For analysis of **quantitative data**, the data collected from the **questionnaires filled in by all 15 participants (P3 to P17)** was taken into consideration, which included:

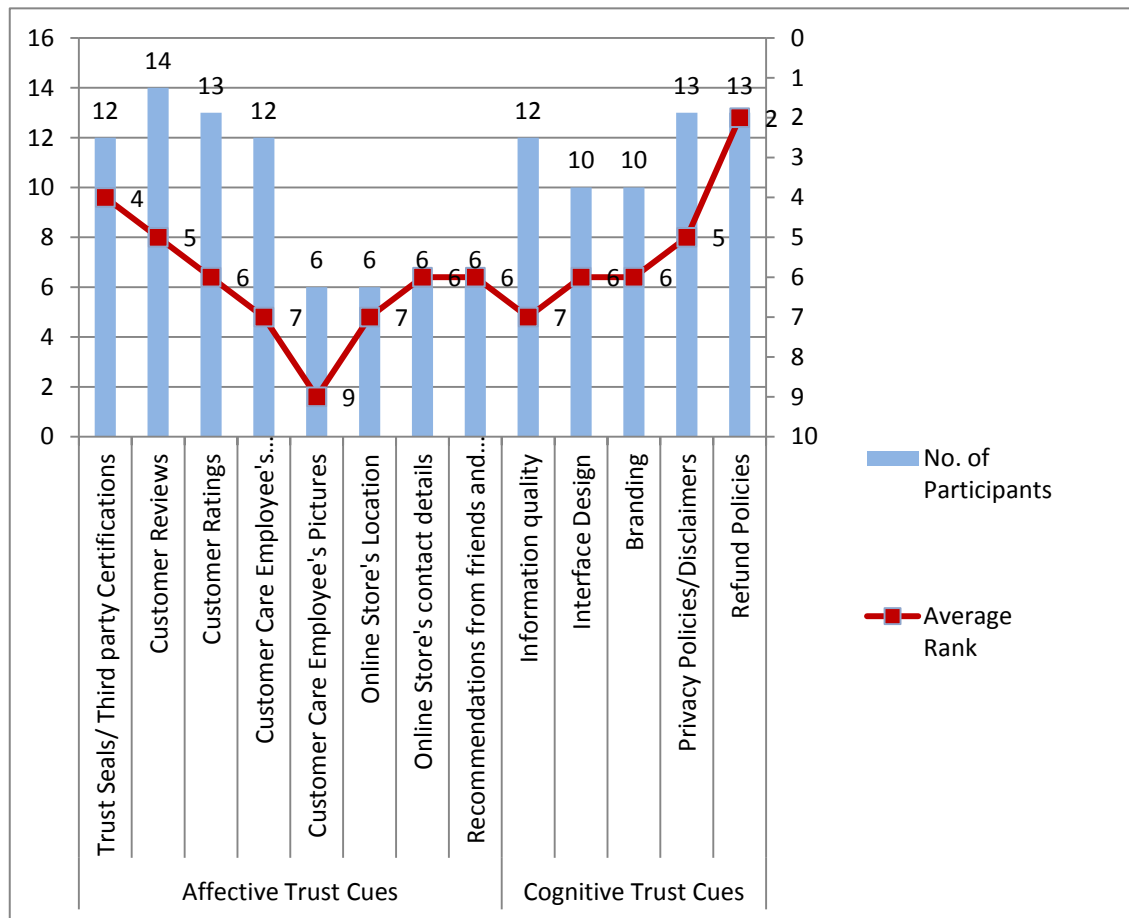
- Store trustworthiness measures/ratings for all 3 conditions (No cues, All cues and Virtually re-embedded cues)
- Trust Cues (Cognitive & Affective) Rankings
- Personality Plus Scores,
- Investment game Scores plus "Consumer disposition to trust" scores

Treatment of qualitative data

For analysis of **qualitative data**, the findings were limited to the data collected from interviews of only 13 participants (P3 and P6 to P17), owing to technical glitches that were experienced while recording the interviews, which prevented the audio recording of 2 participants (P4 & P5).

4.1 Cognition based Cues v/s Affective Cues (Appendix I)

All the 15 participants were asked to choose the elements (**as listed in Appendix E**) that would make them trust the mobile site more. A weighted average rank was calculated each of trust cues listed (**see Appendix I**).



4.1.1 Results (see Appendix I)

It can be seen that out of the 15 participants, **about 14** participants chose **Customer Reviews** followed by **Customer Ratings selected by 13 participants** and Trust Seals /Third party Certifications (12 participants) and Employee Contact numbers (12 participants) that form a part of Affective Trust Cue Group

The other **Affective Trust Cues** like Employee Pictures and Online Store Location, Recommendations from family and Friends etc. **were selected by merely 6 participants.**

On the other hand, **almost all Cognitive Trust Cues** like Privacy Policies, Refund Policies, Information quality, Branding and Interface Design **were chosen by more than 65% users.**

As for the average ranking, Affective Cues comprising Third Party Seals were at Rank 4 (ranked by 12 participants) followed by Customer Reviews

(Rank 5), Ratings (Rank 6), Employee contact details(Rank 7) and Employee Pictures at Rank 9.

Cognitive Cues comprising Refund Policies were ranked at 2, followed by Privacy Policies (Rank 5), Interface and Branding (Rank 6) and Information Quality at Rank 5.

To summarise, on an average,

- About 63% of the total number of participants chose Affective Cues
- About 66% chose Cognitive Cues as factors that would make them increase their trust more towards a given mobile site.
- The highest ranked (Rank 2) were the Refund policies (Cognitive Cues) with 13 participants ranking them as 2, followed by Third Party Seals (Affective Cues) at an average Rank 4, ranked by 12 participants.
- Employee Pictures (Affective Cues) were at the lowest average rank of 9.
- **Cognitive Cues viz., Refund Policies, Privacy Policies, Interface Design, Branding and Product Information Quality played an important role in trust building for more than 66% participants** in addition to the Affective Cues like Trust Seals/Third Party Certifications, Customer Reviews and Ratings and Employee Contact Details.

4.1.2 Discussion

Therefore, to answer the above research question, it would be apt to imply that

- Although majority of the people favoured Cognition based Cues, some of the Affective Cues also played an equally important role in trust building for a mobile commerce site.
- Users not only take into consideration their observations and perceptions, while making a trust decision, the interactions with the trustee (mobile site) significantly affect their trust building.
- Interestingly Interface Design and Branding (with a good average Rank 6, by 10 participants) indicates the importance of Mobile Aesthetics in building trust for most users.

4.2 Personality based factors affecting trust

(Appendix M)

The data collected from the questionnaire categorised all the 15 participants into 4 types of Personalities viz., **Popular Sanguine (PS), Powerful Choleric (PC), Perfect Melancholy (PM), Peaceful Phlegmatic (PP)** (See Appendix L).

The personality score was derived by counting the total number of blanks marked for each column, wherein each column signified one personality type, with the first column being Popular Sanguine, second column scored for Powerful Choleric, third for Perfect Melancholy and fourth for Peaceful Phlegmatic (see Appendix M).

In order to answer the research question whether personality factors affect a person's trusting ability, it was decided to analyse if participants belonging to these four different groups differed in their ability to trust a particular mobile site or not, for which the following "*null hypotheses*" and an "*alternative hypotheses*" were developed:

H₀: Personality type of a person does not affect their trustworthiness towards a mobile store i.e. $H_0: \mu_{PS} = \mu_{PC} = \mu_{PM} = \mu_{PP}$

H_A: Personality type of a person does affect their trustworthiness towards a mobile store.

In order to test the hypothesis, a One-factor Anova test was used (the number of groups being four), in order to understand the differences among the four personality groups against the trustworthiness of a mobile store (with All Trust Cues).

Dependent variables:

Store Trustworthiness : The average rating for each of the 32 responses (based on a 5-point Likert scale) was calculated for the questionnaire covering the screens containing "All Trust Cues" (*as shown in Appendix J*)

Independent Variables:

Four Personality Groups **Popular Sanguine (PS), Powerful Choleric (PC), Perfect Melancholy (PM), Peaceful Phlegmatic (PP)** formed the independent variables for this hypothesis testing.

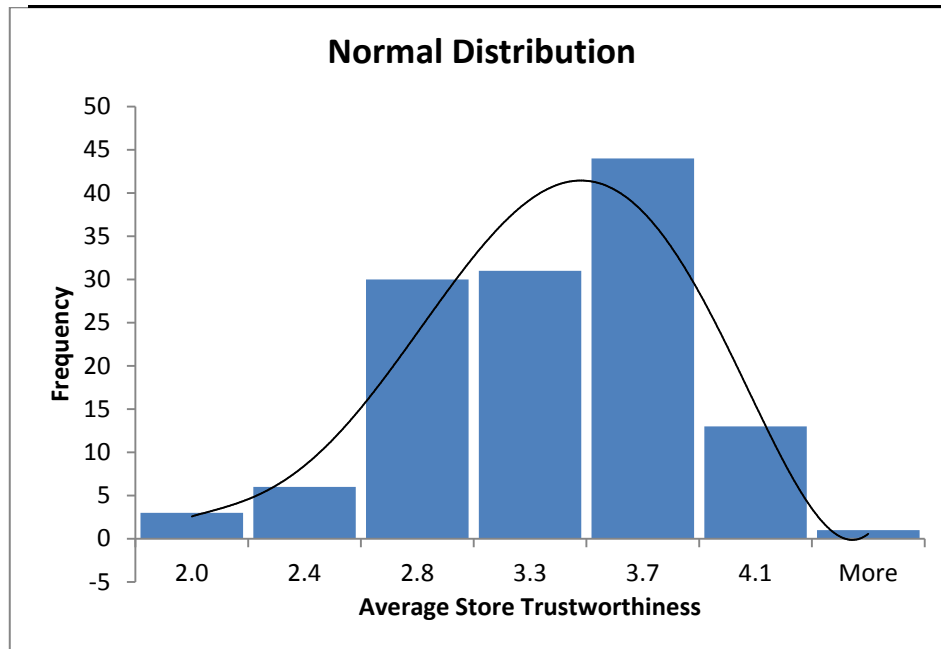
One-factor Anova

Prior to doing the Anova test, it was ensured that the data was normally distributed, since the assumption of Anova is to test with the normally distributed data. The following graph shows that the data was normally distributed.

4.2.1 Results

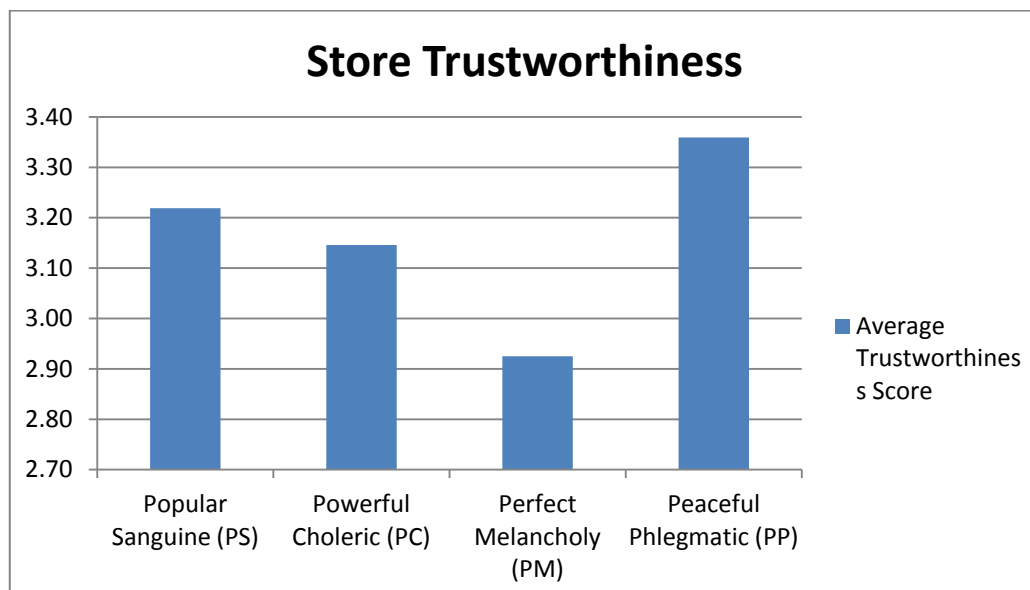
Groups	Count	Sum	Average	Variance
Popular Sanguine (PS)	32.00	103.00	3.22	0.23
Powerful Choleric (PC)	32.00	100.67	3.15	0.26
Perfect Melancholy (PM)	32.00	93.60	2.93	0.10
Peaceful Phlegmatic (PP)	32.00	107.50	3.36	0.31

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.16	3.00	1.05	4.66	0.004	2.68
Within Groups	28.01	124.00	0.23			
Total	31.17	127.00				



Calculations

Excel sheet Add-Ons for data Analysis was used to calculate the Anova using the spreadsheet



As seen from the above table and graphs, participants with **Peaceful Phlegmatic personality tend to have higher trusting ability** (Mean 3.36, SD = 0.31), closely followed by Popular Sanguine (Mean = 3.22, SD = 0.31), Powerful Choleric (Mean = 3.15, SD = 0.26) whereas **Perfect Melancholy (Mean = 2.93, SD = 0.10) individuals show lowest trustworthiness scores.**

The P-value is 0.004 which implies $P < 0.05$, and $F (4.66) > F \text{ critical } (2.68)$. Therefore the **null hypothesis is rejected** and the alternative hypothesis holds good which implies that there is significant difference between different Personality Groups (people with different personality traits like pessimism, optimism, faster decision-making abilities etc.) and their trust-making ability.

4.2.2 Discussion

As expected and supported by previous research Popular Sanguine and Powerful Choleric (individuals who are generally optimistic and risk-takers) scored high trust score averages. A part of these findings with the Perfect Melancholy (individuals who are pessimists and do not trust easily) having the lowest trustworthiness scores is supported as stated in the previous research (Lumsden, J. and Mackay, L., 2006); however the Peaceful Phlegmatic (individuals who are pessimists and feel the need to feel safe

before making a decision) with highest scores contradicts the findings of the same research.

The prime reason for this contradiction in the findings could also be interpreted in a way, which states that Peaceful Phlegmatic, although pessimistic in nature, scored the highest trust scores because they made decisions based on their ***perception of trust owing to presence of trust cues*** on the screens they were shown, which added to their confidence in buying from this site. This supports the first research question that trust cues increase the trustworthiness of the site and in turn their buying decision.

4.3 Gender affecting trust (*Appendix J*)

The data collected from the questionnaire categorised all the 15 participants into 2 gender groups - **Males (P3, P4, P7, P8, P10, P11, P14, P16) and Females (P5, P6, P9, P12, P13, P15, P17).**

In order to answer the research question whether gender affects a person's trusting ability, it was decided to analyse if participants belonging to these two gender groups differed in their ability to trust a particular mobile site or not, for which the following "*null hypotheses*" and an "*alternative hypotheses*" were developed:

H₀: Gender of a person does not affect their trustworthiness towards a mobile store i.e.

H₀: $\mu_M = \mu_F$

H_A: Gender of a person does affect their trustworthiness towards a mobile store.

Since the difference was to be tested with just 2 groups, in order to test the hypothesis, an unpaired t-test was conducted (the group variances being uneven), in order to understand the differences among the four personality groups against the trustworthiness of a mobile store (with All Trust Cues).

Dependent variables:

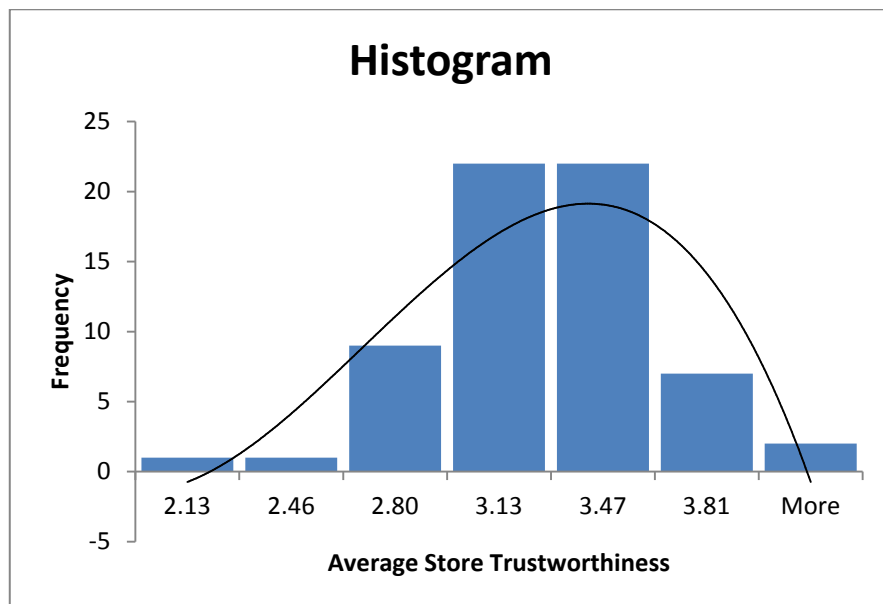
Store Trustworthiness : The average rating for each of the 32 responses (based on a 5-point Likert scale) was calculated for the questionnaire covering the screens containing "All Trust Cues" (*as seen in Appendix J*)

Independent Variables:

Males (M) and Females (F) formed the independent variables for this hypothesis testing.

t-test

Prior to conducting the t-test, it was ensured that the data was normally distributed. The following graph shows that the data was normally distributed.

**Calculations**

Excel sheet Add-Ons for data Analysis was used for t-test calculations (assuming unequal variances for unequal sample size), using the spreadsheet

4.3.1 t-test Results

	<i>Males(M)</i>	<i>Females(F)</i>
Mean	3.004	3.259
Variance	0.096	0.143
Observations	32.000	32.000
df	60.000	
t Stat	-2.951	

P(T≤t) one-tail	0.002
t Critical one-tail	1.671
P(T≤t) two-tail	0.005
t Critical two-tail	2.000

As seen from the above table, **Females tend to have higher trustworthiness for a mobile site** (Mean = 5.26, SD= 0.14) compared to Males (Mean = 3.00, SD =0.09).



The values for t (-2.95) < t critical two-tail (2.00) and P -value (two-tailed) is 0.005 which implies $P < 0.05$. Therefore the **null hypothesis is rejected** and the **alternative hypothesis holds good** which implies that **there is significant difference in the trust-making ability of males versus females**.

4.3.2 Discussion

The findings from this study contradict the findings from literature review that males tend to trust more than females. Previous research relevant to gender studies have also found that males are more risk-seeking in general, compared to females.

In this case, it is clearly evident that females tend to exhibit more trustworthiness for a given mobile store compared to their male counterparts.

This could prove to be an interesting insight in building mobile sites and apps that cater specifically to the female audience and negate the common stereotype that women states women are more risk-averse and make smaller investments when the risk is high, compared to men.

4.4 Experience based factors affecting trust

(Appendix J)

The data collected from the questionnaire categorised all the 15 participants into 2 groups - **Mobile shopping experience (MSE)** - (P7, P10, P13, P16) and **No mobile shopping experience (NMSE)** - (P3, P4, P5, P6, P8, P9, P11, P12, P14, P15, P17)

In order to answer the research question whether prior mobile shopping experience affects a person's trusting ability, it was decided to analyse if participants belonging to these two groups differed in their ability to trust a particular mobile site or not, for which the following "*null hypotheses*" and an "*alternative hypotheses*" were developed:

H₀: Mobile Shopping Experience of a person does not affect their trustworthiness towards a mobile store i.e.

H₀: $\mu_{MSE} = \mu_{NMSE}$

H_A: Mobile Shopping Experience of a person does affect their trustworthiness towards a mobile store.

Groups used:

Mobile shopping experience (MSE) and **No mobile shopping experience (NMSE)** formed the two groups for this hypothesis testing, and were measured for their Store Trustworthiness, using the average mean data of 32 responses from "All Cues" Questionnaire *(as seen in Appendix J)*.

Mann-Whitney U test:

Since the data for two groups wasn't normally distributed, it was decided to use the Mann-Whitney U test for testing this hypothesis, the reason being Mann-Whitney test is apt for testing scenarios wherein 2 independent variables that are not normally distributed are to be measured for statistical differences.

Calculations

The data was further tested again (verification) using the following site to confirm the validity of results generated using the first website.

<http://elegans.som.vcu.edu/~leon/stats/utest.cgi>

http://www.socr.ucla.edu/htmls/ana/TwoIndependentSampleWilcoxonRankSum_Analysis.html

4.4.1 Mann-Whitney U test Results

n1 (Non-mobile shoppers)	n2 (mobile shoppers)	UA	UB	P (two-tailed)	P (one-tailed)	Z
11.00	4.00	28.00	16.00	0.43	0.22	0.78
Mean n1	Mean n2					
3.00	2.58					

As seen from the above table, the **P-value (one-tailed) is 0.43 which implies $P > 0.05$** . Therefore the **null hypothesis is accepted** and the **alternative hypothesis does not hold good** which implies that **there is no significant difference in the trust-making ability of participants who had purchased from a mobile site before to those who had never shopped on a mobile site.**

4.4.2 Discussion

This again contradicts the literature review wherein Beldad, A., et al. (2011) points out that consumers with high levels of internet shopping experience may choose to engage themselves in e-commerce transactions, in spite of knowing about the potential risks involved. This is solely based on the fact that such users are used to or conditioned to carrying out online transactions.

However, from the findings of this study, the users who were used to purchasing goods on their mobile phones did not trust the site more in any case compared to the users who had never purchased from their mobile phones. The results are fairly insignificant to derive to a substantial conclusion. It may however be noted that all the users were used to making purchases from an e-commerce site, so that could in a way make them a homogenous group at a higher level and therefore there was no significant difference in the store trustworthiness of these 2 groups, which could be considered as a sub-sets of belonging to the same group of users familiar with e-commerce.

4.5 No Cues, All Cues and Virtual re-embedded Cues affecting Store Trustworthiness (*Appendix K, J, L*)

The data collected from the questionnaire categorised all the 15 participants into 3 groups –

No Cues (NC) (*Appendix K*),

All Cues (AC) (*Appendix J*) and

Virtually Re-embedded Cues (VRC) (*Appendix L*).

As seen from the questionnaire data, **Virtually re-embedded Cues have the highest mean average rating of 3.48** compared to **All Cues at 3.13** and **No trust Cues at 1.98** indicating that most of the participants strongly agreed with most statements in Virtually re-embedded trust cue screens that were shown to them.

	No Cues	All Cues	Virtually re-embedded
Mean	1.98	3.13	3.48
Standard Deviation	1.00	0.29	0.63

However, in order to answer the research question whether there was a difference in the way all 3 screen cues affects a person's trusting ability using the hypothesis, it was decided to analyse if participants belonging to these 3 groups differed in their ability to trust a particular mobile site or not. The following two "*null hypotheses*" and an "*alternative hypotheses*" were developed adding the 2 groups in 2 Sets **Set 1 and Set 2**:

Set 1

H₀: The trustworthiness towards a mobile store is not affected by the presence of trust cues.

$$H_0: \mu_{NC} = \mu_{AC}$$

H_{A1}: The trustworthiness towards a mobile store is affected by the presence of trust cues.

Set2

H₀: Virtual re-embedding of trust cues does not increase the trustworthiness of a mobile store.

$$H_0: \mu_{AC} = \mu_{VRCS}$$

H_{A2}: Virtual re-embedding of trust cues increases the trustworthiness of a mobile store.

Groups used:

No Cues (NC) and All Cues (AC) were classified into **Set 1** whereas **All Cues (AC)** and **Virtually Re-embedded Cues (VRC)** were classified into **Set 2** and were tested for the above mentioned 2 hypotheses testing, and were measured for their Store Trustworthiness (using the average mean data of 32 responses from "No Cues, "All Cues" and "Virtually re-embedded Cues" Questionnaire.

Wilcoxon Signed-Rank Test for Set1:

Since the data for two groups **No Cues (NC)** and **All Cues (AC)** wasn't normally distributed, and the experiment was a "related design" experiment wherein all participants were tested for all the

conditions, it was decided to use the Wilcoxon Signed-Rank Test (Judith, G., D'Oliveira, M., 2005), for testing this hypothesis.

Calculations

The following website was used on order to calculate the statistics for this test using the raw data from excel sheet.

<http://www.vassarstats.net/wilcoxon.html>

4.5.1 Results for Set1

Participants	No Cues	All Cues	Signed Ranks
1	2.22	2.87	-4
2	2.16	2.60	-2
3	2.94	3.33	-1
4	1.94	3.63	-13
5	2.16	3.47	-8.5
6	1.84	3.47	-12
7	2.06	2.57	-3
8	1.94	2.83	-6
9	1.66	2.97	-8.5
10	2.13	3.10	-7
11	1.66	3.00	-10
12	2.06	2.87	-5
13	1.81	3.53	-14
14	1.41	2.87	-11
15	1.66	3.80	-15

Wilcoxon Signed-Rank Test Results

W	n	Z	P (1-tail)	P (2-tail)
-120	15	-3.39	0.0003	0.0007

As seen from the above table, the value of UA is 828 and **P-value (one-tailed) is <0.0003 which implies P <0.05 and the difference in the results is very significant.** Therefore the **null hypothesis is rejected**

and the **alternative hypothesis holds good** which implies that **the presence of trust cues significantly affects the store trustworthiness of a mobile store.**

Wilcoxon Signed-Rank Test for Set2:

Since the data for two groups **whereas All Cues (AC) and Virtually Re-embedded Cues (VRC) wasn't normally distributed and the experiment was a "related design" experiment wherein all participants were tested for all the conditions**, it was decided to use the Wilcoxon Signed-Rank Test (Judith, G., D'Oliveira, M., 2005), for testing this hypothesis.

Calculations

The following website was used on order to calculate the statistics for this test using the raw data from excel sheet.

<http://www.vassarstats.net/wilcoxon.html>

4.5.2 Results for Set2

Participants	All Cues	Virtual re-embedded Cues	Signed Ranks
1	2.87	3.69	-11
2	2.60	3.06	-3
3	3.33	3.69	-2
4	3.63	3.81	-1
5	3.47	4.09	-6
6	3.47	2.84	7
7	2.57	3.22	-8
8	2.83	3.66	-12
9	2.97	3.72	-10
10	3.10	3.63	-4.5
11	3.00	3.53	-4.5
12	2.87	3.78	-13
13	3.53	2.47	15
14	2.87	3.91	-14
15	3.80	3.06	9

Wilcoxon Signed-Rank Tests

W	n	Z	P (1-tail)	P (2-tail)
-58	15	-1.63	0.0516	0.1031

As seen from the above table, the value of W is -58 and **P-value (two-tailed) is 0.10 which implies $P > 0.05$, and the result is statistically significant.** Therefore the **null hypothesis is accepted** and the **alternative hypothesis does not hold good** which implies that **the virtual re-embedding of trust cues does not significantly increases the store trustworthiness of a mobile store.**

4.5.3 Discussion

The results from Set 1 indicate that the presence of trust cues significantly increases the trustworthiness of a mobile store and provides some kind of reassurance that if the mobile sites are built keeping in mind the trust cues, which are a mix of both cognitive and affective, the users are likely to trust the site more and buy from the same store due to high store trustworthiness. Therefore, elements like branding, information quality, store reputation, all things associated with the mobile interface are important in building trust in the long-term as covered under "**temporal embedding**" (Riegelsberger, 2005). Other elements like security, third party trust seals, certifications etc. that are covered under "**institutional embedding**" (Riegelsberger, 2005), also help in building trust in mobile transactions.

On the other hand, the results of Set 2, **are contradicted by previous research by** Riegelsberger and Sasse (2003) wherein they emphasise that virtual re-embedding increases the trustworthiness of a given store. These are specific elements like employee pictures that are known to create a positive impact on the users in mobile transactions and known to build trust.

However, in case of this research, the users did not consider happy employee faces or their contact information (virtual re-embedding) as a substantial factor for building trust and influencing their buying decision.

4.6 Risk-behaviour (Consumer disposition to trust) and Store Trustworthiness (*Appendix N*)

The participants were made to play an investment game in order to determine if they were risk-averse, risk-neutral or risk-takers. In addition to that they were also asked to rate various statements, on a Likert scale of 1-5 (*Appendix N*), in order to determine their disposition to trust.

Participant Id	Rounds Played	Highest amount re-invested after getting 0 (Nil) returns	Highest Amount Invested (risked)	Highest earned	Consumer disposition to trust (Avg. ratings)	Risk Behaviour
P3	10	2	8	10	3.3	Risk-Neutral (RN)
P4	4	3	3	2	2.3	Risk-Averse (RA)
P5	8	2	2	10	3.2	Risk-Neutral (RN)
P6	10	10	15	20	3.8	Risk-Taker (RT)
P7	10	3	4	35	2.2	Risk-Averse (RA)
P8	7	10	45	0	3.7	Risk-Taker (RT)
P9	7	3	5	4	2.5	Risk-Averse (RA)
P10	3	3	5	0	3.0	Risk-Neutral (RN)
P11	10	8	55	52	3.7	Risk-Taker (RT)
P12	6	6	6	0	3.3	Risk-Taker (RT)
P13	5	5	5	0	3.5	Risk-Neutral (RN)
P14	10	3	3	22	3.0	Risk-Neutral (RN)
P15	4	2	3	2	1.2	Risk-Averse (RA)
P16	7	4	4	3	2.5	Risk-Averse (RA)
P17	5	4	4	0	3.5	Risk-Neutral (RN)

The strategy adopted was to assign all the participants with an average rating of 3 as risk-averse, above 3 as risk-takers and anyone below 3 as risk-neutral.

However, as seen from the chart, **participants P3, P4 and P17 in spite of an average score above 3 have been assigned as Risk-Neutral candidates**. This is because their risk-averseness was determined on the basis of the investment game they played.

As a part of their investment game, the risk-averseness was decided on the basis of 2 components:

- frequency of rounds (higher the rounds played, higher the risk taken)
- amount invested after scoring 0 returns (higher the units invested, higher the risk taken)

This is supported by literature review (Chaudhuri, A. and Gangadharan, L., 2007), that higher the gains and higher is the investment made (safer option), the person is considered risk-averse and if lower the gains and still the investment is high, the person is considered to be a risk-taker (riskier option).

The demarcation for risk-averseness, risk-neutral or risk-taking behaviour again was based on a 50% cut-off margin i.e., anyone who invested more than 50% units (5 units) out of the total 10 units assigned to them was placed on the risk-taking side of the spectrum, one with 50% was marked as risk-neutral and below 50% was considered to be risk-averse.

Similarly, anyone who played 5 rounds was considered risk-neutral and below 5 rounds was considered risk-averse, above 5 was considered risk-taking.

Extreme care was taken to ensure that the participants were assigned one of the 3 risk-behaviours **only after they met all 3 criteria** viz.,

- rounds played
- amount invested after earning 0 returns
- disposition to trust ratings

The data collected from the questionnaire (All Cues) was used for all the 15 participants and classified them as **Risk-Averse (RA), Risk-Neutral**

(RN) and Risk-taking (RT) . In order to answer the research question whether a person's risk-taking ability or consumer disposition to trust affects their trusting ability, it was decided to analyse if participants belonging to these three different groups differed in their ability to trust a particular mobile site or not, for which the following "*null hypotheses*" and an "*alternative hypotheses*" were developed:

H₀: Risk-taking ability (Consumer disposition to trust) does not affect their trustworthiness towards a mobile store i.e.

H₀: $\mu_{RA} = \mu_{RN} = \mu_{RT}$

H_A: Risk-taking ability (Consumer disposition to trust) does affect their trustworthiness towards a mobile store.

In order to test the hypothesis, a One-factor Anova test was used (the number of groups being three), in order to understand the differences among the three risk-behavioural groups against the trustworthiness of a mobile store (with All Trust Cues).

Dependent variables:

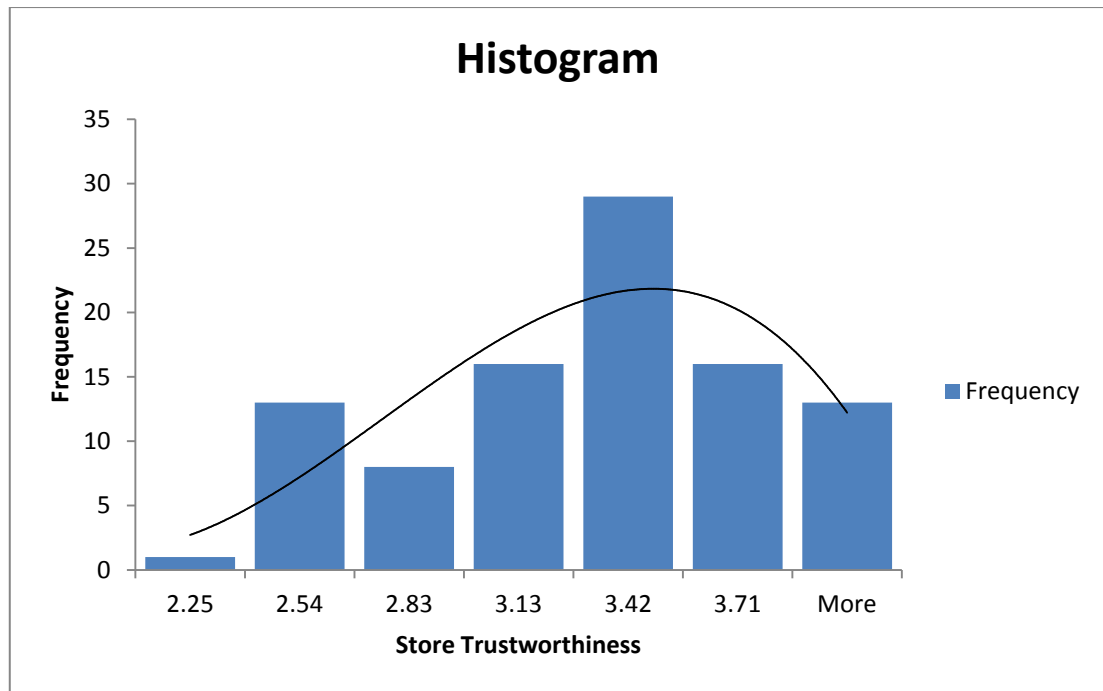
Store Trustworthiness : The average rating for each of the 32 responses (based on a 5-point scale) was calculated for the questionnaire covering the screens containing "All Trust Cues"

Independent Variables:

Three Risk-behavioural Groups **Risk-Averse (RA), Risk-Neutral (RN) and Risk-taking (RT)** formed the independent variables for this hypothesis testing.

One-factor Anova

Prior to doing the Anova test, it was ensured that the data was normally distributed, since the assumption of Anova is to test with the normally distributed data. The histogram graph showed that the data was '**almost**' normally distributed.



Calculations

Excel sheet Add-Ons for data Analysis was used to calculate the Anova using the spreadsheet.

4.6.1 Results

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Risk-averse	32.00	99.75	3.12	0.12
Risk-Neutral	32.00	100.25	3.13	0.10
Risk-taking	32.00	104.75	3.27	0.30

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	0.47	2.00	0.24	1.40	0.25	3.09
Within Groups	15.79	93.00	0.17			
Total	16.26	95.00				



As seen from the above table and graphs, participants with **Risk-taking individuals tend to have a slightly higher trusting ability** (Mean 3.27, SD = 0.30), closely followed by Risk-Neutral (Mean = 3.13, SD = 0.10), whereas **Risk-averse (Mean = 3.12, SD = 0.12) individuals show slightly lowest trustworthiness scores.**

The P-value is 0.25 which implies $P > 0.05$, and $F(1.40) < F_{critical}(3.09)$. Therefore the **null hypothesis is accepted** and the alternative hypothesis does holds good which implies that there is **no significant difference between different risk-taking ability (consumer disposition to trust) and their trust-making ability.**

4.6.2 Discussion

To answer the research question, the fact that even though the person may exhibit higher disposition to trust, other factors like the presence of trust cues, their prior shopping experience or recommendations from family and friends significantly play a role in their ultimate decision making process, which increases the trustworthiness of the site and in turn their buying decision. So even though a person may be a high risk-taker, a lot of external factors, like mobile interface or other entities in the environment are determinants of his buying decision and affects his trusting ability to a large extent.

5. Qualitative Data Analysis, Results & Discussion

As pointed out earlier, **the qualitative data analysis results were limited to the data collected from only 13 participants (P3 and P6 to P17)**, owing to technical glitches that were experienced while recording the interviews.

5.1 Content Analysis Method (Appendix O, P, Q)

As pointed out in methods (3.2.4), for qualitative data analysis, ***Content Analysis technique*** was used for the transcribed data collected from the interviews and the data was classified using **three major categories** viz.,

- Affective Cues
- Cognitive Cues
- Disposition to trust

These were further broken down into **minor categories** which were further **assigned codes** as shown the following table:

Major Categories	Code	Minor Categories	Keywords/Meaning
Cognitive Trust Cues	C1	Information quality	Product images, 360 degree product views, colours, price, discounts, delivery time, payment options/modes, product options,
	C2	Interface Design	User friendliness
	C3	Branding	Logo, site colour, look & feel
	C4	Privacy Policies/Disclaimers	Privacy policy
	C5	Return/Refund Policies	Return policies, money-back guarantee
Affective Trust Cues	A1	Trust Seals/ Third party Certifications	Verisign, VISA, https
	A2	Customer Care Employee's email/contact number	Comment form, customer care contact number and email
	A3	Customer Care Employee's Pictures	Customer Care Employee's Pictures
	A4	Online Store's Location	Physical location of the store, store address
	A5	Online Store's contact details	Store's contact number, email

Disposition to trust	A6	Customer Reviews	Customer reviews, customer experience
	A7	Customer Ratings	Product ratings (star ratings)
	A8	Recommendations from friends & family	Word-of-mouth, family recommendations
	A9	Site reputation	Site reviews, forums, search results, twitter, advertisement of the site, brand perception
	D1	High Disposition to trust	
	D2	Low Disposition to trust	

The category codes were then assigned to **each relevant keyword /keywords (underlined data as shown in Appendix Q) for each line** in the transcribed data and **frequency of each was determined** and assigned as the "Total Score" (*as shown in Appendix P*)

The Total Score was calculated as shown in Appendix F. Each keyword was assigned a score of 1, which was then assigned to the respective category. Therefore, the total score was derived at by summing up all the keyword scores for all 13 participants.

Total score (*as shown in Appendix P*)= Category Score (keyword count) for 13 participants

This was done for each participant and an aggregate score (total score) was calculated for each category. The average score was calculated as follows:

Average score (*as shown in Appendix P*)= Total Score/Total no. of participants (13)

5.2 Results

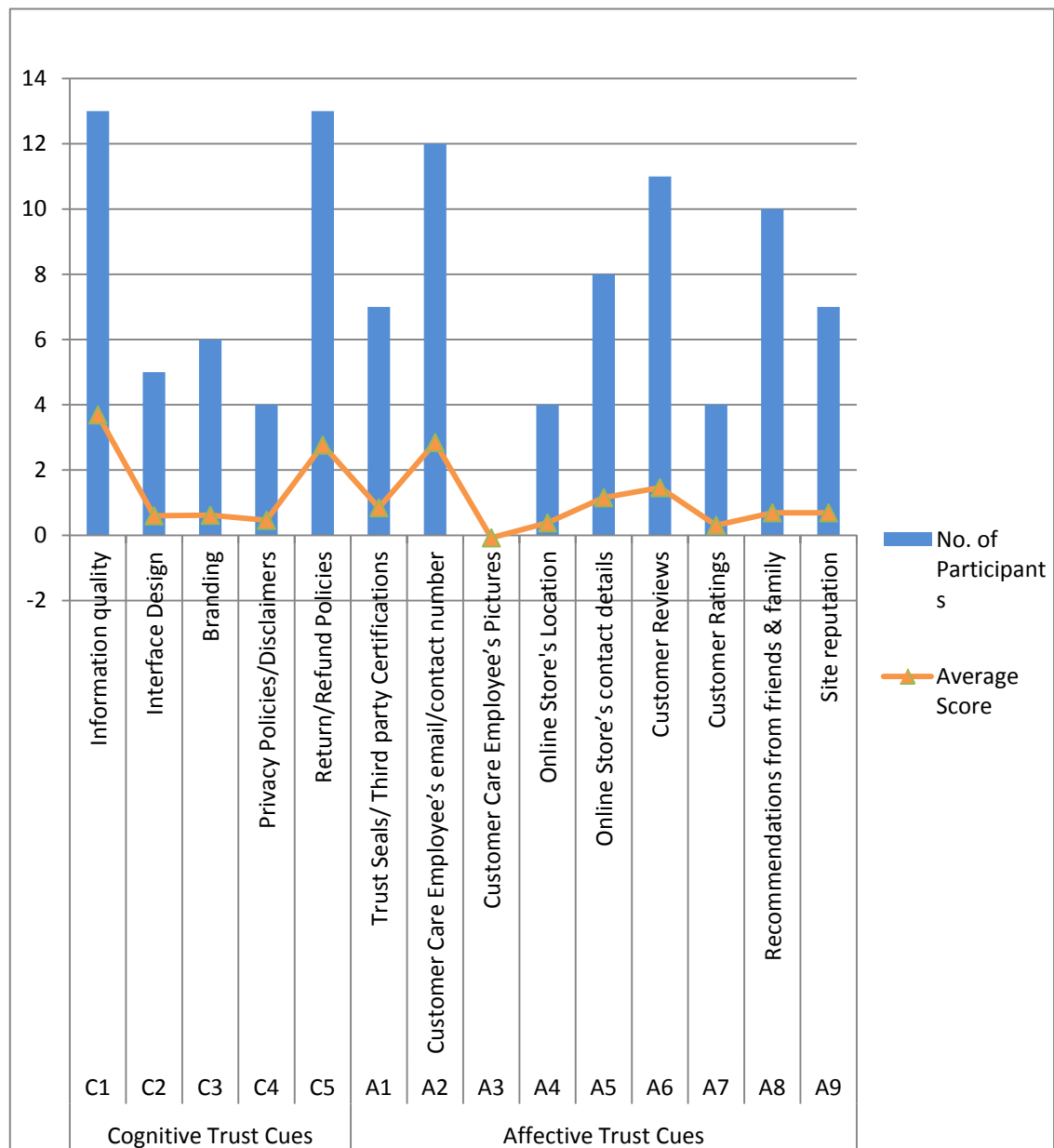
5.2.1a Cognition based Cues v/s Affective Cues

The table below shows a Total score and Average score calculated by counting the keywords assigned to different categories as shown in **Appendix P**.

Major Categories	Code	Minor Categories	Participants in favour of trust cues	Total Score	Average Score
Cognitive Trust Cues	C1	Information quality	13	48	3.7
	C2	Interface Design	5	10	0.8
	C3	Branding	6	8	0.6
	C4	Privacy Policies/Disclaimers	4	6	0.5
	C5	Return/Refund Policies	13	36	2.8
Affective Trust Cues	A1	Trust Seals/ Third party Certifications	7	11	0.8
	A2	Customer Care Employee's email/contact number	12	37	2.8
	A3	Customer Care Employee's Pictures	0	0	0.0
	A4	Online Store's Location	4	5	0.4
	A5	Online Store's contact details	8	15	1.2
	A6	Customer Reviews	11	20	1.5
	A7	Customer Ratings	4	4	0.3
	A8	Recommendations from friends & family	10	10	0.8
	A9	Site reputation	7	9	0.7
Disposition to trust	D1	High Disposition to trust	5	6	0.5
	D2	Low Disposition to trust	10	13	1.0
Product Value	P1	High Product value	2	3	0.2
	P2	Low product value	2	2	0.2

Further to add to the analysis, **a sum of average scores for Cognitive Cues and Affective Cues was calculated** as shown in the table below:

Cues	Code		Total score	Average Score
Affective Trust Cues	A1	Trust Seals/ Third party Certifications	11	0.8
	A2	Customer Care Employee's email/contact number	37	2.8
	A3	Customer Care Employee's Pictures	0	0.0
	A4	Online Store's Location	5	0.4
	A5	Online Store's contact details	15	1.2
	A6	Customer Reviews	20	1.5
	A7	Customer Ratings	4	0.3
	A8	Recommendations from friends & family	10	0.8
	A9	Site reputation	9	0.7
Total Affective Average score				0.9
Cognitive Trust Cues	C1	Information quality	48	3.7
	C2	Interface Design	10	0.8
	C3	Branding	8	0.6
	C4	Privacy Policies/Disclaimers	6	0.5
	C5	Return/Refund Policies	36	2.8
Total Cognitive Average score				1.7



5.2.1b Discussion

1. Cognitive Trust Cues more effective in building trust in m-commerce transactions compared to Affective Cues

As seen in the table above the participants seem to incline towards the Cognitive Trust Cues (Average score of 1.7) more than the Affective Trust Cues. (Average score of 0.9)

2. Cognitive Cues like Information Quality and Refund Policies affect trust building the most than any other cues, for users performing m-commerce transactions.

The categories give a brief insight into the trust factors that participants pointed out as a part of their tasks and interviews. It can be seen that Cognitive Cues like Information Quality and Refund Policies were selected by all 13 participants.

Also, for the total score assigned to each category, **Information Quality claimed the highest score** (47) with most participants insisting on the product information comprising *product images, 360 degree product views, colours, price, discounts, delivery time, payment options/modes, product options*, etc..indicating that people lay a lot of emphasis on the product information that is visible to them upfront owing to lack of physical product before making a purchase. They tend to gather as much information as possible in order to help them make an informed decision of purchasing from an online mobile store.

P13: " It gave me all the details required, detailed product information".

P17: " How detailed the product shown to me. I browse through products, different product angles (images)."

P14: "Product information, what is the replacement/refund policy, What are the delivery options, I look at the price comparison"

3. Affective Cues like Customer care number/email follow in closely after Cognitive Cues when it comes to building trust in m-commerce sites.

As seen from the graph, affective Cues like Customer care number and email were selected by 12 participants. Some of the excerpts from the transcribed interviews that support this statement:

P3: "I would buy from this site because it has customer care number"

P12: It's much easier, Customer Service part is important, just pick up and call them or email them. It's much more interactive"

4. Affective Cues like Customer Reviews and Recommendations from friends and family and Third Party Certifications also significantly affect a consumer's trust in m-commerce transactions.

As seen from the table/graph, Customer Reviews were selected by 11 participants, Recommendations from family and friends selected by 10 participants.

To elaborate on it more, it is seen that trust cues like Customer Reviews, Third Party Certifications and Recommendations from friends and family influence their trust decisions to quite some extent, indicating the trust factors that go beyond the realm of the trustee (mobile site) in terms of product information or interaction with the mobile site.

P9: "If I get to know from friends/relatives, I would prefer those sites."

P13: "First one would be word-of-mouth. I would ask my friends if they had visited the site and then buy from there."

P11: "There were comments (reviews) on it (the product). Those who had purchased had left a reply, going through that I feel much more comfortable and secure buying through that."

P12: "Reviews were visible upfront, no need to click and view them."

P6: " I noticed the third party seals (Verisign, Visa) on the 2nd site (Virtual re-embedded site). It was on the back of my mind and it instils trust."

P10: " It was Verisign secured, so I can enter my card details without worrying it would go into wrong hands."

Customer Care Contact details/Email and Customer Reviews scored at 37 and 20 respectively, which indicates the cues people look for to give them **assurance that should something go wrong, there is a fall-back mechanism and thereby increases their trust more for the mobile site** in question.

5. Site Reputation (Affective Cue) also has an effect on a consumer's trust in m-commerce transactions.

Site Reputation was being mentioned by 7 participants (more than 50% of the total participants). This was an interesting find as the participants laying an emphasis on the reputation of the online vendor, which could not be measured as a part of Quantitative data or tasks assigned to them. However, from the interview data it became evident that the participants not only relied on customer reviews for the product they were purchasing but also based their trust inclination towards the mobile site's (trustee) reputation, which they gauged by visiting various other sites, forums, FB pages, Twitter feeds, etc.

P6: "I will go to forums , google to see what people have to say about the site. I will see comments, reviews for the product, check their Facebook Page etc.

P7: "I would rather go for customer reviews, not just for the product, but I would also look at site reviews, forums, search results."

P13: " Advertisement of the site, good brand perception etc. adds credibility."

6. Consumer trust is not affected by Employee Pictures.

An interesting fact to note here is that **none of the participants thought that Affective Trust Cues like Employee Pictures were important** and could influence their trust decisions in any way.

7. Interface Design and Branding are trust cues (Cognitive) that do not affect a consumer's trust to a very large extent.

Cognitive Cues like Interface Design and Branding in terms of the user-friendliness of the site or presence of logo and site colours, as mentioned by the participants, do not influence their trust decisions to a very large extent, only to some extent.

P16: "The look of the site matters, better user experience would make me trust the site more."

Therefore, to answer the research question - 4.1.1 - that whether cognition-based cues affect a consumer's trust in m-commerce transactions more than affective cues, it would be apt to imply that

- Most **participants focussed more on Cognitive trust cues (Information quality, Refund policies etc.)** while expressing their opinion about trust factors that eventually influenced their buying decision. **This is in sync with the Quantitative data analysis which indicated that Cognitive Cues are much more significant** in the trust-building process.
- **The analysis also indicates that the users' trust decisions are highly influenced by entities that go beyond just the product information quality** (which is considered very important) and interaction with the trustee (i.e.) the mobile site, which was also concluded from the Quantitative data analysis.
- **The trust decisions are also affected by the trustee's (mobile site) online** reputation in terms of their reviews mentioned in forums, social media and search results.
- **Interestingly, Interface Design and Branding (with a very low average score of 9) was mentioned by less than 50% contradicting the importance of Mobile Aesthetics,** in building trust for most users, as indicated by the Quantitative data analysis.

5.2.2a Consumer Disposition to Trust

Another interesting element that emerged from the interview data was the other factors that influenced the trust decisions of the participants.

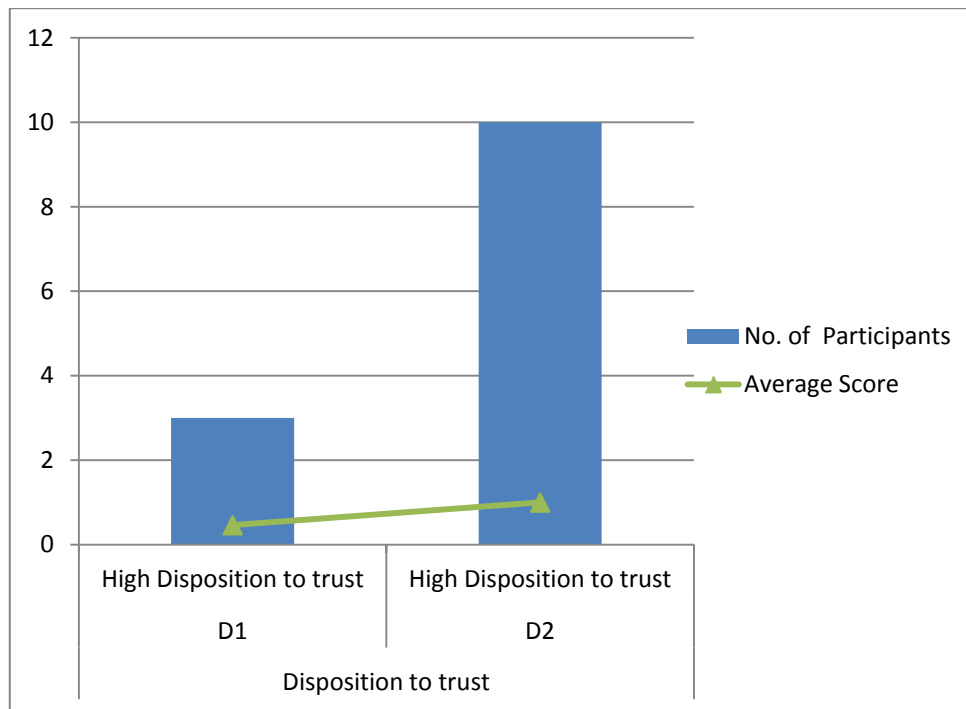
As seen from the graph around 10 participants exhibited a lower disposition to trust whereas around 3 exhibited high disposition to trust.

Their low disposition to trust was concluded from the statements wherein the participants simply refused to purchase from a site with which they had a bad experience, either in terms of the product they purchased (damaged) or in terms of a financial loss as a result of purchasing from the site.

P7: " I won't purchase from that site because I would have the same fear"

Higher disposition to trust was indicated when the participants instilled blind faith in the sites they had a bad experience with but were still ready to purchase from those sites nevertheless.

P17: " I have purchased jewellery, t-shirts, sizes are important, so product information/details are really important. I have purchased high value products like Blackberry Phones."



5.2.2b Discussion

1. Relation between Low Disposition to trust and Cognitive / Affective Cues (see Appendix R)

The participants who exhibited high disposition to trust were P3, P4, P7, P8, P10, P11, P12, P13, P14, P15.

As seen from the table, the participants with Low disposition to trust favoured more of Affective Cues (with an average score of 8.6) as compared to Affective Trust Cues (with an average score of 7.9). Therefore, things like friends and family recommendations, customer ratings and reviews, site reputation, third party seals, i.e. factors external to the mobile site are more important for people to gain more confidence and trust a particular mobile site.

Cognitive Cues	P3	P6	P7	P8	P10	P11	P12	P13	P14	P15	Average
C1	4	2	5	4	3	3	1	5	6	1	
C2		2	4	2				-1		1	
C3	1	1			1		1			1	
C4	1	1			2						
C5	2	4	2	3	4	2	3	1	4	3	
Total	8	10	11	9	10	5	5	5	10	6	7.9
Affective Cues	P3	P6	P7	P8	P10	P11	P12	P13	P14	P15	Average
A1	3	1			3	1		1			
A2	4	3	3	3	6	3	2	6	2	1	
A3	-1										
A4	1						1				
A5	2	1		1	4			1	2		
A6	2	2	-1	1	2	3	1	3	1		
A7		1				1	1	1			
A8	1	1	-1		1	1	1	1	1	1	
A9	1	1	1		1		1			2	
Total	13	10	2	5	17	9	7	13	6	4	8.6

2. Relation between High Disposition to trust and Cognitive / Affective Cues (see Appendix S)

The participants who exhibited low disposition to trust were P9, P16 , P17.

As seen from the table, the participants with High disposition to trust favoured more of Cognitive Cues (with an average score of 9) as compared to Affective Trust Cues (with an average score of 7.3).

Therefore, it can be concluded that if the user has a higher disposition to trust, he need not rely on family recommendation or customer reviews etc. The trust is further built with factors like Product information quality, interface of the mobile site, Branding, and mobile site privacy policies etc. It's more dependent on the site (trustee) than the external factors.

Cognitive Cues	P9	P16	P17	Average
C1	2	4	8	
C2	-1	1		
C3		3		
C4	2			
C5	2	2	4	
	5	10	12	9
Affective Cues	P9	P16	P17	Average
A1		1	1	
A2	2	2		
A3				
A4	2	1		
A5	2	2		
A6	2	1	2	
A7				
A8	1		1	
A9		1	1	
	9	8	5	7.3

6. Evaluation, Reflection & Conclusion

This research was carried out primarily to understand the trust factors that affect a consumer's decision before making a purchase online on a mobile B2C website, since there has been barely any research carried out in this regard in spite of the entire perspective of e-commerce soon shifting to m-commerce in current times.

The initial research questions that were aimed at were slightly modified during the course of this project.

The initial project plan aimed at answering the following research questions:

1. For an m-commerce transactional website, do cognitive trust cues (achieved through social embedding) affect a consumer's trust decisions more than the affective trust cues (achieved through temporal & institutional embedding) and in turn their buying decision?
2. a. Does virtual re-embedding affect a website's trustworthiness and usability, and in turn a consumer's buying decision?
b. For an m-commerce transactional website, do factors like gender, personality and prior online shopping experience, affect a consumer's disposition to trust (risk-averseness) and influence their trust decisions?

Whereas the initial scope of the research was maintained, the final research questions were revised and refined further based on the literature review, time constraints and the decision to carry out an experimental procedure as the desired method for this research project. These were:

1. Do cognition-based cues affect a consumer's trust in m-commerce transactions more than affective cues?
2. What effects do other factors like personality oriented factors, gender, mobile-shopping experience-based factors, have on a consumer's trusting ability?
3. a. Does *the presence* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site compared to *absence* of trust cues?
b. Does *virtual re-embedding* of trust cues (cognitive and affective) affect a consumer's trust in that mobile site?

4. Does the risk-taking ability (disposition to trust) of a person affect a person's ability to trust m-commerce transactions and their intention to purchase?

6.1 Project Planning

The project was carried out as per the original plan submitted. The data collection was completed faster than the estimated time, however, "The Investment (Risk) Game" was later included after revising the literature review and wasn't a part of the original plan was what took the most amount of time, as it was not planned for. But there was sufficient time that was squeezed in from the data collection time estimation. The major chunk of time was consumed by Data Analysis owing to lack of prior experience with the same.

The Quantitative Data Analysis was completed on par with the expectations, in spite of the researcher's beginner level understanding of statistical analysis. However, the Qualitative Data Analysis could have been fairly detailed, but had to be constrained due to lack of time.

6.2 Literature Review

The literature review submitted as a part of the original project plan covered a wide range of topics covering trust factors in ecommerce, mobile contexts, gender affecting trust factors, personality affecting trust factors, risk and trust etc. and was substantial enough to lay a foundation for the overall research questions.

This was further refined and elaborated during the course of the project, thereby informing the experimental design in order to answer each of the research questions and further helping in the validation of the conclusions derived from the data analysis and supporting the answers for the decided research questions.

6.3 Method

The mobile site was designed using the Wordpress platform, whereas the original project plan included the use of iOS SDK and Android SDK platforms, and create an app for creating the 3 testing conditions.

This was keeping in mind the existing skill set of the researcher and the time which was allotted for the development of the same, it was felt using Wordpress would help in keeping the project on track. This however, limited the inclusion of participants using other platforms like Blackberry, Symbian, etc. since the sites were not optimised for these platforms.

As mentioned earlier, "The Investment Game" was an addition made to the experimental design method, which was not planned for. The game was included as a part of the experiment later because sufficient literature review wasn't looked into while creating the initial project plan. However, later it was realised that in order to answer one of the research questions, the game had to be developed, since doing the same using yet another set of questionnaires would have caused a lot of boredom for the participants, owing to the multiple questionnaires that they were already asked to fill out as a part of the entire process. But since the researcher had some prior experience and background in coding, with a little bit of more research and time, a very basic working version of game was developed and conveniently included as a part of the original experimental design.

The pre-interview questionnaire data wasn't used as planned. The details about the kind of products (high value, low value) people purchased could not be analysed in great detail and synced with the qualitative data, as it was felt the data gathered wasn't enough to come to a substantial conclusion, nor was there any more time to support the same with the help of additional academic research. The literature review conducted in this regard wasn't sufficient enough and hence was discarded from the scope completely.

In addition to that, the " Trust Measures (Cues) Questionnaire" (Appendix E) was also modified to a large extent after conducting the first pilot interview.

The tasks designed for the experiment too underwent a change after the first pilot was conducted.

6.3.1 Recruitment

The recruitment was carried out smoothly as planned, with a balanced mix of participants in the age range of 18-35 years, comprising 9 males and 8 females, out of which 2 participants (1 male and 1 female) were treated as pilots.

These were mostly done via email and telephonic conversations to ensure that the desired participants were able to allot a slot for the given experiment. A conscious effort was taken to filter out specific people who were using either Android or iPhone smart phones. A couple of people backed out at the last minute owing to the location constraints. However, keeping that the location was the biggest constraint in recruiting the desired candidates, 3 locations, albeit with similar conditions, were used in order to ensure that the participants were available as per their convenience at the allotted time, since all participants could not make it to one single location in order to save on their commuting time. However, since the experiment required that they need not be under any kind of stress when carrying out the experiment, the researcher had to compromise and oblige to ensure the participants were comfortable during the entire research process. This in no way affected the experimental time or results, because the entire procedure with the restricted time frame kept in mind, was practised beforehand to ensure the same approach was used for all participants, irrespective of the location chosen.

It was also observed that the recruitment could have been a lot more easier, and a lot more users recruited, had the participants using other mobile platforms like Windows, Blackberry, Symbian etc (and not just limited to iPhone and Android platforms) been included. The participants using these platforms were discarded owing to the limited technical skill set that the researcher had which prevented the working of the mobile sites on other platforms.

6.4 Data Collection and Analysis

For the data collection, a couple of things went wrong, which was totally unprecedented. During the first few interviews, although care was taken to test the research equipment before conducting the interviews, with