4. Research Design

A research design is a system that indicates the subtle elements of the methods important for getting the data expected to structure or take care of the examination issue (Malhotra 2007). It gives the structure to be utilized as an aide as a part of gathering and investigating information (Nargundkar 2003). It will be a set of development choices that make up the expert arrangement determining the techniques and methods for gathering and dissecting the required data (Smolders and Bramble 2007).

Research design can be ordered into three classes: exploratory, descriptive and causal. Exploratory research plan underscores on picking up new thoughts, foundation data and experiences which are useful in portraying and elucidating the issue all the more correctly (Churchill Jr. 2001). Descriptive research plan will be decisive in nature (Malhotra 2007). It is embraced to get answers to inquiries of who, what, when, where and how (Smolders and Hedge 2007). Clear research outline can be of two sorts: cross-sectional and longitudinal. A cross-sectional exploration configuration is an one-shot examination study at a given point of time and comprises of a test of populace of interest (Nargundkar 2003). A longitudinal exploration outline includes a settled specimen of populace components that is measured more than once on the same variables (Malhotra 2007). Causal examination outline will be concerned with deciding the cause and impact connections (Churchill Jr. 2001).

The decision of the most proper research design relies on the amount we think about the issue and the exploration goals (Smolders and Shrub 2007). In the present research, a cross-
sectional design was utilized (Malhotra 2007). As the goal of the exploration was to discover the relationship between clients' apparent equity and their recovery satisfaction and their behavioural propositions. In this manner, this outline was suitable for the study and consequently utilized.

**Sampling Design**

**Population**

The student users of cellular phones.

**Sampling Unit**

The specimen comprised of understudy subjects from different schools and colleges. The review was done in real urban areas of Madhya Pradesh (Gwalior, Indore, Jabalpur and Bhopal). The significant purpose behind considering understudies was that they are the most dynamic fragment utilizing mobiles. They utilize their cellular telephones for making calls as well as for playing games, downloading ring tones, surf the web, listening to music and testing reactions to SMS challenges.

The utilization of student sample is viewed as fitting on the grounds that it for the most part contains a blend of individuals from diverse social and financial foundations and consequently speaks to the general purchasing consumers (Smith, Bolton and Wagner 1999; Bodey and Elegance 2006; Schoefer and Ennew 2005; Hocutt, Groves and Donavan 2006; Bonifield and Cole 007).

**Sampling Technique**

The present study utilized both judgment and convenience sampling to gather the information. In judgment testing populace components are purposively chosen taking into
account the judgment of the researcher. In the first place, the judgment examining was utilized where we chose to gather the information from the graduate and post graduate understudies in colleges and universities. Examination bolsters the utilization of judgment examining (Oliver 1993; Poon, Hui and Au 2003; Karatepe and Ekiz 2004). At that point we utilized comfort sampling because of time and monetary requirements. Marketing of services research additionally underpins the utilization of convenience method of sample (Davidow 2000; Spake et al 2003; Walsh and Mitchell 2005; Hocutt, Groves and Donavan 2006).

**Sample Size**

To refine the scale according to localized data first a pilot sample of 300 respondents was taken and adopted questionnaire containing 32 questions was administered to those students. No item was removed after first step of refining so our questionnaire still consisted of 32 statements, therefore, following the rule of thumb of 5 subjects per item; our sample size of 1690 respondents is adequate. It was ascertained beforehand that every respondent had complained regarding service failure.

Churchill Jr. (1979) recommended that the unwavering quality and legitimacy of the scale ought to be tried with new information. Since PLS SEM is used using SmartPLS software the reliability and validity was calculated while testing the outer model. In the second stage for testing hypothesized relationships again SmartPLS was used to investigate the inner or structural model. SEM requires use of larger sample size to maintain the accuracy of estimates and to ensure representativeness (Schumacker and Lomax 1996). But since the SEM is conducted through PLS Technique the requirement of large sample size is not important (Hair and Hult, 2006). But still the data was collected from 2000 mobile phone
users who complained and 1690 usable questionnaires were returned, thus giving us a response rate of 84.5 percent for this study.

**Questionnaire**

**Measurement**

Multi-item scales that were validated in previous studies were identified and modified to fit the study setting. All exogenous and endogenous variables were measured on 7-point Likert-type scales (1 = *strongly disagree* and 7 = *strongly agree*). Distributive Justice was evaluated as the perceived outcome (compensation) fairness. Procedural Justice was measured as the perceived fairness of procedures and timely responsiveness. Interactional Justice was appraised as apology, explanation, and concern toward customers. Recovery satisfaction was measured after a service failure scenario and a service recovery scenario were presented. Trust was appraised as confidence in the reliability and the integrity of the service provider. Commitment was evaluated as the willingness to maintain the relationship. Behavioural intentions were measured by assessing the respondents’ willingness to revisit and recommend the restaurants to others. Interactional Justice had four questions and was taken from Blodgett, Hill, & Tax, 1997; Maxham & Netemeyer, 2002b. Procedural Justice again had four questions and was adopted from Maxham & Netemeyer, 2002b. Distributive Justice also had four questions and was taken from Blodgett et al., 1997; Maxham & Netemeyer, 2002b. Trust and commitment construct had four questions each and was adopted from Morgan & Hunt’s (1994) scale. Repurchase intentions questionnaire had three questions and Blodgett et al., 1997; Maxham & Netemeyer, 2002b. Word of Mouth intentions scale again had three questions and was adopted from Maxham & Netemeyer, 2002b.
Data Analysis Techniques

Data analysis techniques to refine the scale

*Pearson’s Product-Moment Correlation Coefficient (Item-to-total Score)*

Pearson product moment connection manages the relationship between an ideally weighted linear blend of indicators and criterion (Nunnally And Bernstein 1994). It is characterized as the whole of the results of the standard scores of the two measures isolated by the degrees of freedom (Malhotra 2007). With a specific end goal to check the dependability of the scale, the relationship of indicators with its own factor and with different factors of the scale was computed.

To check the dependability of scale above all else correlation of every item with the aggregate score for that measure was to figure out if every item connects with the conjectured measurement. Indicators having low correlation ought to be erased yet no such items were found as will be evident from the data analysis section described later.

*Construct Reliability using Cronbach Alpha*

The reliability of the items in the adopted questionnaire was checked by applying cronbach alpha.

Reliability is an assessment of the degree to which measures are free from errors and of consistency between multiple measurements of a variable (Peter 1979; Hair et al. 2003). To check the reliability of scale the most common method which is being used is internal consistency (Hair et al. 1998). Internal consistency depicts the estimates of reliability based on the average correlation among items within a test (Nunnally and Bernstein1994). The internal consistency and quality of the scale is being checked by using the coefficient alpha.
Coefficient alpha measures the degree to which all the items in a construct are interrelated (Hayes 2008).

**Date analysis techniques for hypothesis testing**

This section depicts the system utilized to assess the measurement model and to test the theorized relations.

Business and related social science researchers, particularly marketing researchers, generally agree that structural equation modelling (SEM) has become a dominant analytical tool in empirical research. In the past decade, marketing researchers have embraced SEM techniques to such an extent that it can be justifiably maintained that its use is ubiquitous. Almost every issue of major academic marketing journals reports on research employing SEM. But while such a sweeping statement is in fact accurate, it understates future even more widespread applications of SEM. The latter is because almost all SEM applications in marketing were, until recently, the result of applying the covariance-based (CB) approach to SEM and not the variance-based partial least squares (PLS)-SEM path modelling. Indeed, most empirical marketing researchers have little understanding of the two major types of SEM, or are even aware that there are two.

**Structural Equation Modelling (SEM)**

A variance based structural equation modelling through Partial Least Square or PLS SEM is used instead of covariance based SEM. SmartPLS software is used as a software tool to apply variance based SEM. Several studies including (Hair, 2011) have quoted that CB-SEM’s statistical objective is to estimate a covariance matrix that matches that of the observed sample data as closely as possible. Hence, the focus is largely on achieving model “fit” assuming valid and reliable constructs. CB-SEM approaches largely ignore the prediction objective. Broadly speaking, empirical marketing research has two objectives: prediction and
explanation. One can conclude that previous CB-SEM applications overlooked a major empirical marketing research objective, namely, prediction. The solution to this inherent weakness in previous structural modelling is the far less known PLS path modelling. In contrast to CB-SEM, PLS-SEM’s overriding objective is predicting the dependent (endogenous) variables (constructs).

(Mohamad, 2013) Compared to CB-SEM, PLS-SEM offers other advantages besides emphasizing prediction. Many empirical marketing researchers pay lip service to data characteristics such as heteroskedasticity and lack of normality, noting the robustness of the statistical techniques. In fact, most empirical marketing data is characterized by such inadequacies. In the present study the data was taken largely from college students and hence was skewed and it has been suggested by many authors that covariance based SEM assumes that data is normally distributed.

(Wong, 2013) said consequently, CB-SEM applications that use the maximum likelihood (ML) algorithm—which most do—overlook the inherent violations of this technique’s required assumptions. Because PLS-SEM does not require these restrictive distributional assumptions, it is often a more viable approach than CB-SEM.

The utilization of SEM obliges six stages to be performed (Kline 1998; Hair et al. 2006) which are clarified further.

This step includes characterizing the constructs that give premise to the determination and outlining of individual pointer items or indicators (Hair et al. 2006). The scale indicators can be operationalized in arrangement, for example, Likert scale or semantic differential scale. The indicators can be gotten from the past researches considers or can develop new measures (Hair et al. 2006). In this study we have derived them from previous research.
Model particular alludes to the introductory theoretical model framed by the scientist on the premise of an audit of writing (Schumaker and Lomax 1996). Determination of the measurement model obliges putting forth formal and express expressions about the quantity of common factors variables; the quantity of indicator variables; the fluctuations and covariance among the shared components; the connections among observed variables and latent elements; the relationship among unique elements and indicator variables and the changes and covariance among the unique measures (Long 1983). The measurement model includes indicating which indicator variables characterize a construct and mirrors the degree to which the observed variables are defining the measure variables regarding validity and reliability (Schumacker and Lomax 1996). It characterizes relations between the indicator and their formed construct variables and gives connection between scores on a measuring instrument and the basic measures (Byrne 2001). A measurement model determines the placed relations of the observed variables to their hidden constructs and also with the other constructs (Anderson and Gerbing 1988). The improvement and detail of model obliges a few conditions which are examined beneath.

Unobservable or latent variables should be measured by as many observed variables for high accuracy (Shah and Goldstein 2006). But we are using PLS SEM which does not pose any such type of constraint on data. PLS SEM method have several advantages over CB Based SEM which is include the normality of data distribution not assumed. Means that, the data with nonnormal can be conducted in structural equation modeling since its application is performed the non parametric method. Besides, indicators (items) with fewer than three for each constructs could be carry on since the identification issues has been overcomed (Mohamad 2013).

Again there are no such constraints posed by PLS based SEM as compared to CB based SEM. This step involves designing an empirical study which will first test the measurement
theory and if all goes well the same data will be used to test the structural relations. There are various issues which are to be dealt with before further analysis. For SEM analysis, two types of data matrices can be used for data input i.e. correlation/covariance and raw data. But in our study we have used PLS SEM that uses raw data as input compared to covariance matrix in CB SEM. SEM requires much larger sample size for results to be close to true values of population parameters (Schumacker and Lonax 1996). But again PLS SEM does not put the constraint of large sample size on data but still our sample size is sufficiently large i.e. 1690.

After defining the constructs, specifying the model and collecting data the next step is to assess whether the measurement model is valid (Hair et al. 2006). To test the validity of measurement model one should check for overall model fit and assessment of fit of the internal structure of the model.

Not required in PLS SEM based studies as suggested by (Hair et.al, 2011) as they are prediction based and not model fit based.

**Build or Composite Reliability**

Dependability is a measure of inner consistency of the develop markers, delineating the extent to which they demonstrate the basic inactive build (Hair et al. 2006).

Build dependability implies that an arrangement of idle markers of develops are reliable in their estimation (Lu, Lai and Cheng 2007). For composite reliabilities, esteem more prominent than 0.6 are worthy (Bagozzi and Yi 1988).

**Normal Variance Extracted (AVE)**
Normal difference removed mirrors the general measure of fluctuation in the pointers represented by the inactive develop (Hair et al. 1998).

An AVE of under 0.50 demonstrates that the difference because of estimation mistake is bigger than the fluctuation caught by the build (Fornell and Larcker 1981).

**Appraisal of Construct Validity**

Since the dependability does not guarantee the legitimacy of the builds, the following stride is to survey the legitimacy of every develop (Hair et al. 1998). Build legitimacy alludes to how well a measure really measures the develop it plans to quantify (Netemeyer, Bearden and Sharma 2003). Two sorts of validities are inspected as under:

It is a measure of build legitimacy that measures the degree to which the scale associates decidedly with different measures of the same develop (Malhotra 2007). A measure is said to have united legitimacy if free measures of the same develop focalize, or are profoundly corresponded (Netemeyer, Bearden and Sharma 2003). United legitimacy of a develop can be surveyed in the accompanying ways:

1. **Factor Loadings** - The institutionalized stacking gauges equivalent or above 0.5 demonstrate for the united legitimacy of the develop (Anderson and Gerbing 1988; Hair et al. 2006).

2. **Average Variance Extracted (AVE)** - The AVE equivalent to 0.5 or more prominent additionally demonstrates for the concurrent legitimacy (Fornell and Larcker 1981; Hair et al. 2006).
3. Reliability - The build dependability measures up to or above 0.7 shows concurrent legitimacy (Nunnally and Bernstein 1994; Hair et al. 2006).

Discriminant Validity

Discriminant legitimacy requires that a measure ought not associate too exceptionally with measures from which it should vary (Netemeyer, Bearden and Sharma 2003; Malhotra 2007). In the event that the connections of the elements that underlie sets of markers that should gauge distinctive builds are not unnecessarily high, then there is confirmation of discriminant legitimacy (Kline 1998). It can be evaluated by two techniques. To start with, by contrasting the normal fluctuation separated (AVE) with the squared connection between's develops (Fornell and Larcker 1981). The AVE qualities ought to be more noteworthy than squared relationship assess; this recommends the develops have more extricated change than difference imparted to different builds (Fornell and Larcker 1981; Hair et al. 2006). Besides, it can be surveyed for two assessed builds by obliging the evaluated connection parameter between them to 1.0 and after that performing a chi-square contrast test on the qualities acquired for the compelled and un-compelled model and an altogether bring down chi-square esteem for the model in which attribute relationships are not compelled to solidarity. This shows the develops are discriminant legitimate. (Anderson and Gerbing 1988).

Be that as it may, in this study we have utilized a strategy recommended by (Henseler, Ringle and Sarstedt, 2015) called HTMT. It has been appeared by method for a reproduction study that the traditional methodologies (i.e., the Fornell-Larcker paradigm and cross-loadings) don't dependably identify an absence of discriminant legitimacy in like manner examination
circumstances. These creators thusly have proposed an option approach, in view of the multitrait-multimethod network, to survey discriminant legitimacy: the heterotrait-monotrait proportion of relationships (HTMT).

**Specifying the inner constructs**

After the estimation model is demonstrated solid and substantial, the following stride includes determination of the auxiliary model to test the basic relations (Anderson and Gerbing 1988). It includes determination of an auxiliary model by doling out connections starting with one build then onto the next in view of the proposed hypothetical model and deciding the fitting unit of investigation (Hair et al. 2006).

**Assessing the Structural Model Validity**

The last stride includes the endeavors to test legitimacy of auxiliary model and its comparing speculated hypothetical connections (Hair et al. 2006). Testing speculated hypothetical connections includes analyzing the individual parameter evaluates that speak to every particular theory. It additionally considers that the parameter appraisals are measurably huge and are in the anticipated heading (Hair et al. 2006).