

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

The reliability of the research depends upon the scientific methodology used. This chapter discusses the approach and methodology adopted for the study. It describes the scope, objectives, period design, population, sample and sampling techniques, tools used procedure of data collection and statistical techniques used for data analysis.

3.2 DESIGN OF THE STUDY

The Research Design of the present study is descriptive and exploratory in nature. The objectives of the research were to study various Business Process Reengineering (BPR) initiatives taken by State Bank of Patiala and to find out customers' perspective regarding the same. The study examined various factors which provide satisfaction to customers and their relationship (Tangibility, Responsiveness, Access, Reliability, Cost, Performance Outcome, Information Technology Support, Empathy and Assurance). The study also measured financial performance of bank and compared both periods (Pre BPR Period and Post BPR Period). In addition, the purpose was to identify bank employees' perspective regarding BPR initiatives' performance and factors influencing successful implementation of BPR.

3.3 OBJECTIVES OF THE STUDY

The objectives of the study were:

- 1) To study and identify Business Process Reengineering initiatives in State Bank of Patiala.**

It is imperative to study and identify various Business Process Reengineering initiatives to understand the change brought by State Bank of Patiala. To know how

this tool of change management i.e. Business Process Reengineering brought various changes in organizational processes, it becomes important to be aware of changes adopted by State Bank of Patiala in the form of modified processes.

- 2) To study the inter period comparison (Pre BPR 2001 to 2005 and Post BPR 2006 to 2010) on the basis of Business Process Reengineering initiatives taken by the bank under study.**

Tools of change management are adopted to improve customers' satisfaction by making a positive impact on quality of services but tool adopted does not serve its purpose if it does not improve financial performance. Therefore, an attempt has been made to find out whether BPR was able to improve financial well-being of State Bank of Patiala.

- 3) To study the customers' perspective regarding the Business Process Reengineering (BPR) initiatives taken by State Bank of Patiala.**

Business Process Reengineering follows a customer centric approach. Therefore, an endeavor was made to know customers' perspective regarding quality of services. There was need to identify factors influencing customers' satisfaction and relationship of these factors with the same. BPRSERPERF (Business Process Reengineering Service Performance) Scale was developed for the same.

- 4) To study the employees' perspective regarding the Business Process Reengineering (BPR) initiatives taken by State Bank of Patiala.**

Employees are drivers of change management. Therefore, it is important to know their perspective about Business Process Reengineering tool adopted by their organization. An attempt has been made to know their perspective regarding any improvement in service quality after implementation of BPR. The relevant factors have been identified for the successful implementation of BPR.

3.4 VARIABLES STUDIED

The following variables have been studied:

Tangibility: Customers of the bank believe that tangibility i.e. evidence of good infrastructure whether physical or IT infrastructure, are face of the services. Tangibles are used by firms to convey image and are signal of quality.

Responsiveness: Responsiveness here means timely action taken by employees while providing services to customers.

Empathy: Empathy is simply recognizing emotions in others, and being able to put yourself in another person's shoes.

Reliability: Reliability here means error free operations, skilled employees, agreed services, commitment of employees and safe internet banking.

Assurance: Assurance means ability of employees to inspire trust and confidence among customers.

Cost: Cost implies charges levied to customers for services like ATMs, internet banking, Debit card etc.

Information Technology (IT): It implies technology used to perform banking functions by employees which enables speedy transactions, accuracy and ease of transacting.

Performance Outcome: The term Performance outcome implies the expectation/end results from the Business Process Reengineering initiatives.

Access: Access here means ability of individual to grab financial services. Access to banking is ability to access of banking services but here access refers to access and speed of State Bank of Patiala branches and other business cells of bank easily accessible. Physical access means more points of service delivery.

Based on the CAMEL Model to judge customers' satisfaction, following variables were studied.

Capital Adequacy Ratio: Also known as Capital to Risk Assets (CRAR) Ratio is the relationship between bank's capital to its risk. It measures capital absorbed in bank.

Net NPAs as Percentage of Advances: The ratio is proportion of Net NPAs to Net Advances. It is a tool to gauge the quality of assets.

Priority Sector Advances as a Percentage of Total Advances: This ratio is proportion of Priority Sector Advances to Total Advances.

Deposit per Employee: This ratio is basically a proportion of total deposits and number of employees of bank during particular financial period. This ratio signifies the deposit mobilization by bank's employees.

Credit per Employee: This ratio is basically a proportion of total Advances and number of employees of bank during particular financial period.

Business per Employee: Business in financial terms means total of deposits and advances. Business per Employee is proportion of Business of bank and number of employees of bank.

Profit per Employee: This ratio is a proportion of profits of bank to number of employees.

Return on Assets: This Ratio signifies earnings of organization. It implies proportion of Returns to Assets of bank.

Return on Equity: This ratio is of utmost importance for shareholders as it signifies returns on their equity invested in business.

Spread Ratio: Spread is the difference between interest income and interest expense and spread ratio is proportion of spread and working funds or assets.

Burden as a Percentage of Average Assets: Burden is difference between non-interest operating expenditure and non-interest operating income. Burden means Interest charges are burden on bank, which reduces bank's profitability. This ratio is calculated by dividing burden with average assets or total assets.

Net Profit as a Percentage of Total Income: Net Profit is a percentage of total income is also referred as Net margin. Net profit is excess of revenue over expense and this resultant figure is divided with total income to obtain this ratio.

Cash Deposit Ratio: Cash Deposit Ratio is proportion of cash in hand and balances with RBI to total deposits.

Liquid Assets to Total Assets: Liquid assets implies total of liquid assets in hand. It is divided with total assets to know liquidity position of bank.

Seven critical factors have been identified for knowing the critical factors of Business Process Reengineering (BPR) in State Bank of Patiala.

BPR Initiatives: Business Process Reengineering Initiatives taken by State Bank of Patiala. These are basically changed processes.

BPR Performance: BPR performance is resultant output from BPR Levers like customers' convenience, speedy work, accuracy etc.

Tangibility: Tangibility implies State Bank of Patiala's physical infrastructure whether concrete, Information Technology infrastructure, Quality of documents, seating arrangements etc.

Empowerment: Employee empowerment is giving employees a certain degree of autonomy and responsibility for taking decision in organizations.

Participation and Involvement: Participation and involvement implies participative style of management where employees are being consulted and their opinions are taken.

Top Management Commitment: Management is considered committed and devoted to their work when they take interest in implementing change seriously and transfers vision of change from top to bottom.

Empathy: Empathy is emotional appreciation of others feeling and behaving in response to that. It is generally said "the ability to see the world through someone else's eyes".

3.5 HYPOTHESES OF THE STUDY

To convene the objective of comparing the financial performance (Pre and Post BPR implementation) on the basis of Business Process Reengineering initiatives taken following hypotheses have been tested.

H5A There is significant improvement in financial performance in the bank, Post BPR period

H5-1 There is significant improvement in Capital Adequacy Post BPR implementation.

H5-2 There is significant improvement in Asset Quality, Post BPR implementation.

H5-2a There is significant improvement in Net NPAs as percentage of Net Advances, Post BPR implementation.

H5-2b There is significant improvement in Priority Sector Advances as a percent of Total Advances, Post BPR implementation.

H5-3 There is significant improvement in Management efficiency, Post BPR implementation.

H5-3a There is significant improvement in Deposit per Employee, Post BPR implementation.

H5-3b There is significant improvement in Credit per Employee, Post BPR implementation.

H5-3c There is significant improvement in Business per Employee, Post BPR implementation.

H5-3d There is significant improvement in Profit per Employee.

H5-4 There is significant improvement in Earning quality, Post BPR implementation

H5-4a There is significant improvement in Return on Assets, Post BPR implementation.

H5-4b There is significant improvement in Return on Equity, post BPR implementation.

H5-4c There is significant improvement in Spread Ratio, post BPR implementation.

H5-4d There is significant decline in Burden Ratio, Post BPR implementation.

H5-4e There is significant improvement in Interest Income to Total Income/Net Margin Ratio Post BPR implementation

H5-5 There is significant improvement in Liquidity Position, Post BPR implementation.

H5-5a There is significant improvement in Cash Deposit Ratio Post BPR implementation.

H5-5b There is significant improvement in Liquid Assets to Total Assets Ratio Post BPR implementation.

H5-6 There is significant decline in transaction cost Post BPR implementation.

To study the customer's perspective regarding the BPR initiatives on services provided by the bank under study the following hypotheses have been formed:

H1- BPR Dimensions have a positive association with Customers' Satisfaction.

Hypothesis 1-1 The Assurance dimension of BPR has significant relationship with Customers' Satisfaction.

Hypothesis 1-2 The Access dimension of BPR has significant relationship with customers' satisfaction.

Hypothesis 1-3 The Responsiveness dimension of BPR has significant relationship with customer satisfaction.

Hypothesis 1-4 IT Support dimension of BPR has significant relationship with customer satisfaction.

Hypothesis 1-5 The Performance Outcome dimension of BPR has significant relationship with customer satisfaction.

Hypothesis 1-6 The Empathy dimension of BPR has significant relationship with customer satisfaction.

Hypothesis 1-7 The Cost dimension of BPR has significant relationship with satisfaction.

Hypothesis 1-8 The Tangibility dimension of BPR has significant relationship with customer satisfaction.

Hypothesis 1-9 The Reliability dimension of BPR has significant relationship with customer satisfaction.

3.6 SCOPE OF THE STUDY

The Business Process Reengineering was implemented in full swing at the end of financial year 2005. Thus, the study assumes 2001-2005 period as Pre-BPR period and 2006-2010 as Post-BPR period. This way the study covers a total of ten years' time period.

To study the customers' satisfaction, only those customers have been studied who have been transacting with the bank for at least 5 years before BPR implementation and are still using the services. For judging the awareness and identification of various BPR initiatives by State Bank of Patiala and factors effecting successful BPR

implementation, the bank employees were interviewed personally. The personal interviews of bank employees and bank customers have been carried out in the bank branches of Punjab and Chandigarh.

3.7 POPULATION OF THE STUDY

It refers to the unit from which information is collected and provides the basis of analysis. In the present study the population consists of two strata:

- (i) **Employees of the bank:** Employees working at operational level in various branches of State Bank of Patiala. The bank employees from these branches are primarily clerks, front line managers, cashiers, accountants etc. They were interviewed as these are the persons who are actually using the BPR initiatives of the bank on a day to day basis.
- (ii) **Customers of the bank:** The customer here means a customer who has been transacting with the bank for at least 5 years before BPR implementation and is still using the services. Categories of the customers are shown in the table 3.1.

Table 3.1: Stratification of customers

Name of the BPR initiative
Grahak Mitra, Drop Box and Liability Central Processing Cell (LCPC)
Retail Assets and Small Enterprises Credit Cell (RASECC)
Centralized Pension Processing centre (CPCC)
Agricultural Central Processing Centre (ACPC)
Trade Finance Central Processing Centre
Total Sample Size

3.7.1 Population Size

As the banks do not disclose the exact number of their customers, it is difficult to estimate the total number of customers. However, the number of employees at the operational level was 5216 (RBI, 2011) in year 2011.

3.7.2 Sample Design

Sample refers to the unit from which information is collected and provides the basis of analysis. Purposive sampling method has been used for selecting the customers. According to this approach, the researcher himself/ herself decides the size and content of sample to get maximum results from the data (**Bryman, 2008**).

Customers were interviewed across Punjab and Chandigarh. For the purpose of interview, customers taken under study are availing bank's specific services (BPR initiative) like services from Centralized Pension Processing Centre (CPCC) for pension holders or Agricultural Central Processing Centre (ACPC) for rural customers. The basis for customers' stratification is shown in table 3.2. Initially the target of 300 customers was decided but learning from review of literature and discussions with colleagues and other researchers, it was decided to distribute more questionnaires as response rate of respondents is never 100 percent or some of the questionnaires miss certain information (**Schleyer and Forrest, (2000); Zhang, (2000) and Quigley et al. (2000)**).

Table 3.2: Sample Size

Name of the BPR initiative	No. of Respondents
Grahak Mitra, Drop Box and Liability Central Processing Cell (LCPC)	100
Retail Assets and Small Enterprises Credit Cell (RASECC)	50
Centralized Pension Processing centre (CPCC)	50
Agricultural Central Processing Centre (ACPC)	50
Trade Finance Central Processing Centre	50
Total Sample Size	300

Employees have direct interaction with the bank customers who are the ultimate users of BPR products. Total of 200 employees formed the sample for the study. Employees were also selected using purposive sampling. All employees in the sample were interviewed using a structured questionnaire.

3.8 DATA COLLECTION

The first objective was achieved by doing deliberations with bank executives of Business Process Reengineering (BPR) department/Section. Chief General Manager BPR and executives working in bank's BPR section were interviewed for collecting primary information from them. No other source of information could be traced for the same except one or two news excerpts. Bank's circulars and memos helped us to compile information about these. Pertaining to financial performance and growth of the bank: profitability, productivity, business (Deposits and Advances), aggregate data on all India basis has been used and this secondary data has been collected from the State bank of Patiala's annual reports and publications, Indian Bank Association's (IBA) publications, RBI's reports, bulletins and Internet uploads etc. To judge customers' perspective regarding services after BPR implementation the bank's customers residing in Punjab and Chandigarh have been interviewed with the help of a structured questionnaire. For the last objective, data has been collected by administering structured questionnaire from employees.

The questionnaire was formalized very carefully taking into consideration the objectives of the study. The questionnaire was designed on the basis of the study of the existing research literature and brainstorming sessions held with the research supervisor, academicians and banking personnel.

3.9 RESEARCH INSTRUMENTS AND TOOLS

3.9.1 CAMEL Model

In the 1980s, CAMEL rating system was first introduced by U.S. supervisory authorities to measure banking performance (**Gupta Ruchi, 2014**). Camel Approach is

basically based on five aspects of banking which can be analysed and these five dimensions are **Capital, Asset Quality, Management Efficiency, Earnings and Liquidity** which conveys the financial condition and operating soundness. Asset Quality is used as an indicator to judge the credit risk for financial institutions, which further helps in judging the reliability of Capital Ratios (**Kwan and Eisenbeis, 1997**). **Chaudhry and Singh (2012)** analysed how asset quality impacts the financial efficiency and strength of the bank. The major players in keeping soundness of bank are risk management, NPA levels, effective cost management and financial inclusion.

3.9.2 BPRSERVPERF (BPR Service Performance Scale)

A majority of questions required respondents to specify their degree of agreeableness or satisfaction on a 5-point Likert-type scale. Likert type Scale with 5-points was applied for recording the perceptions of the respondents. According to **Clason and Dormody, (1994)** a Likert scale, is collection of a series of four or more Likert-type items that are analyzed using single composite score during study. This type of scale uses several statements to measure a participant's attitude towards a single concept. The advantage of using a Likert-type scale is that it can be treated as an interval scale, even though strictly speaking, it is considered an ordinal scale (**Hair et al., 2007**).

To know the perspective of Customers BPRSERVPERF has been developed on the basis of SERVPERF. Thirty six dimensions have been added into standard 22 dimensions of SERVPERF.

SERVQUAL (**Parasuraman, Zeithaml & Berry, 1988**) and SERVPERF (**Cronin & Taylor, 1992**) scales have been employed to evaluate service quality in different industries. It is suggested that scales should be tailored and modified to the explicit requirements of research in consideration, organization or culture (**Lapierre et al., 1996**).

Services marketing literature presents different critical reviews using SERVQUAL, which finds out gap scores of Services Expectation and Services Perception score (**Parasuraman, Zeithaml & Berry, 1988**). Though SERVPERF (**Cronin & Taylor,**

1992) scale is useful for judging only perception regarding quality of service received. Therefore, **BPR Service Performance Scale**, BPRSERVPERF developed on the basis of SERVERF by adding 36 more attributes to 22 items recommended by SERVERF.

Alfred and Addam (2001) identified 15 variables while judging the attitudes of employees. **Parasuraman et al., (1994)** identified reliability, responsiveness, competence, accessibility, courtesy, communication, credibility, security, understanding and tangibility as important variables.

3.9.3 BPR Performance Measurement Scale (BPRPMS)

Kuwaiti and Kay (2000) developed an instrument for measuring performance measurement in BPR, and ascertained that a relevant Performance Measurement System (PMS) in the BPR context is one which takes account HR working in organization and producing final output for into account people working in teams, and producing final output for a customer through internal customer-vendor relationships. **De Toni and Tonchia (1996 and 2001)** claimed that in the endeavor of excellence and efficiency in organization change occurs in the form of management-by-process organization, and that management-by-process has consequences for the Performance Measurement System (PMS).

Maul et al. (2003) identified ten dimensions and condensed these to within five themes: 1) taking a strategic approach, 2) integrating performance measurement, 3) creating a business process architecture, 4) involving human and organizational factors, and 5) identifying the role of information technology.

So, based on literature, these areas have been identified as BPR Initiatives, Tangibility, Empowerment, Participation and Involvement, Top Management Commitment, Information Technology, BPR Performance and Empathy and named as, Business Process Reengineering Performance Measurement System (BPRPMS).

3.10 DATA INTERPRETATION AND ANALYSIS

Statistical tools as discussed above have been used for the purposes of data analysis. SPSS package, MS Excel helped in processing of raw data. Appropriate conclusions have been drawn by interpreting and tabulating the results.

3.10.1 Factors Analysis

For the analysis purpose statements were identified in respective factors for analysis. A statistical method known as Factor Analysis has been used to describe variability among observed, correlated variables. It is a technique similar to Correlation and Regression that explains the shared similarity or variability (Nunnally, 1978). Confirmatory factor analysis (CFA) is a statistical method to understand the factor structure of a set of variables under study.

Reliability and Validity Tests

The reliability of BPRSERVPERF constructs has been tested. Reliability here proves that same set of results will be derived if measurement is repeated (Miester, 2003). Communalities of the initial extraction are analysed in the beginning which shows majority of items have value more than 0.50 which is considered standard measurement for selecting variable/item. As in the given table all variables are carrying value higher than the standard 0.50. In this model the communalities are based on that each variable would be taken only, if values are more than 0.50, otherwise should not be included in cluster.

Principal Component Analysis is used when we obtain a number of measures from obtained variables. Therefore, it is a variable reduction technique. In other words, variables with higher values are effectively represented in the common factor space while variables with lesser value are not well represented (Malhotra, 2004). It is believed that variance is common. The communalities are the measurements of the extent to which a variable is explained by the analysis. It is basically proportion of variance explained by all factors.

Construct validity refers to assessment whether developed construct through questionnaire and data collection actually measure the problem under study. It is basically about targeting and measuring the operating reality of developed concept or idea (Trochim, 2006). We basically accumulate different types of validities like face validity, content validity, concurrent and predictive validity, and convergent and discriminant validity. First, the Kaiser-Meyer-Olkin (KMO) test was applied to measure the correlations among the variables used in the study and Bartlett's test of Sphericity was analysed to check sample adequacy. The values of KMO range from 0 to 1. But standard acceptable norm is over 0.5. On the contrary, Bartlett's Test of Sphericity, the value should be less than 0.05 which indicates significance of the study and indicates the validity of the response to the selected problem. Table 3.2 given below shows the results of KMO and Bartlett's Test of Sphericity.

Table 3.2: Reliability Test for Dimensions/Factors of Customers' Satisfaction

Dimensions	Cronbach Alpha	Dimensions	Cronbach Alpha
Tangibility	0.888	Performance Outcome	0.910
Reliability	0.860	Cost	0.790
Assurance	0.826	Access	0.870
Empathy	0.870	IT Support	0.890
Responsiveness	0.876	Customers Satisfaction	0.860

Table 3.3: Reliability Test for Dimensions/Factors of BPR Performance

Dimensions	Cronbach Alpha	Dimensions	Cronbach Alpha
BPR Levers	0.787	Training and Education	0.795
Tangibility	0.850	Participation and involvement	0.890
Empowerment	0.876	Top management Commitment	0.870
BPR Levers	0.850	Information Technology	0.830
Tangibility	0.846	Training and Education	0.760

3.10.2 Arithmetic Mean

The Arithmetic Mean or Mean is the average of set of numbers used for the purpose of analysis. It is derived by dividing the sum of set of numbers by total number of terms. To calculate mean both Arithmetic mean method and Geometric mean method have been used.

The biggest benefit of using this method is that it is quite simple to use. Just adding the numbers and dividing it by total numbers gives the required result. For quick observation of data, it is considered the best statistical tool. When multiple data sets are extracted from bigger population, it is least affected by of all fluctuations.

It is calculated as follows:

$$\text{Mean } (\bar{x}) = \frac{\sum x}{N}$$

\bar{x} = Arithmetic Mean

$\sum x$ = Sum of all the values of the variable

N = Number of observations

3.10.3 Standard Deviation

Standard deviation is measure of variability. It is a measure of dispersion of set of data or variability of data from its mean. It is used to understand how different numbers in set are spread apart from the mean value. The standard deviation formula is very simple: it is the square root of the variance. It is calculated as follows:

$$\text{Standard Deviation (S.D.)} = \sqrt{\frac{\sum x^2}{N}}$$

$$x = (X - \bar{x})$$

S.D. = Standard Deviation

\bar{x} = Actual mean of the series

X = Observation of the series

x = Deviations of the items from the mean

3.10.4 Coefficient of Variations (C.V.)

The coefficient of variation is shown in percentage and calculated from the average and calculated by dividing the standard deviation by mean. Coefficient of Variations (C.V.) is a statistical measure of the dispersion of data points in a data series around the mean.

This is actually the ratio of the standard deviation to the mean, and compares the degree of one data with other; therefore, it is the measure of spread that describes the amount of variability relative to the mean. It is calculated as follows:

$$C.V. = \frac{SD}{Mean} \times 100$$

3.10.5 Chi-square Test (χ^2)

Chi square test is used to judge the difference between theory and observation. It is applied to find out the differences between degrees of comparison for e.g. degrees of Likert scale. It compares the observed results with the probable results to verify the significant differences or test the "goodness of fit". It can be used with many categories of responses like agree, strongly agree, disagree, and strongly disagree, yes-no. Statistically, the sum of the squared difference between observed and the expected or deviation from expected. Therefore, use the chi-square distribution table to determine significance of the value.

The acronym ANOVA refers to analysis of variance and a step in Regression model to see the goodness of fit or not. ANOVA table gives an overall confidence for the fit to be rejected. The lower p value, then model fit the data. Typically, if Significance level is greater than 0.05, we conclude that our model could not fit the data.

3.11 Regression Model

The regression model used for the present study is: $Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 \dots \dots \dots (1)$

Where Y is BPR Customer Satisfaction (BPRCS) (Independent Variable), a= constant, X1 ,X2 ,X3, X4 ,X5 ,X6 ,X7 ,X8 ,X9=Dimensions of Customer Satisfaction (Independent Variables), Variables), [X1,"Tangibility" X2,"Reliability", X3,"Assurance", X4,"Empathy", X5, "Responsiveness" X6,"Performance Outcome", X7," Cost", X8,"Access",X9 "IT Support".

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