INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

IJRCM

A Monthly Double-Blind Peer Reviewed (Refereed/Juried) Open Access International e-Journal - Included in the International Serial Directories

Indexed & Listed at:

Ulrich's Periodicals Directory ©, ProQuest, U.S.A., EBSCO Publishing, U.S.A., Cabell's Directories of Publishing Opportunities, U.S.A.,

Open J-Gage, India [link of the same is duly available at Inflibnet of University Grants Commission (U.G.C.)],

Index Copernicus Publishers Panel, Poland with IC Value of 5.09 & number of libraries all around the world.

Circulated all over the world & Google has verified that scholars of more than 4255 Cities in 176 countries/territories are visiting our journal on regular basis.

Ground Floor, Building No. 1041-C-1, Devi Bhawan Bazar, JAGADHRI – 135 003, Yamunanagar, Haryana, INDIA

http://ijrcm.org.in/

CONTENTS

CALL FOR MANUSCRIPTS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the areas of Computer Science & Applications; Commerce; Business; Finance; Marketing; Human Resource Management; General Management; Banking; Economics; Tourism Administration & Management; Education; Law; Library & Information Science; Defence & Strategic Studies; Electronic Science; Corporate Governance; Industrial Relations; and emerging paradigms in allied subjects like Accounting; Accounting Information Systems; Accounting Theory & Practice; Auditing; Behavioral Accounting; Behavioral Economics; Corporate Finance; Cost Accounting; Econometrics; Economic Development; Economic History; Financial Institutions & Markets; Financial Services; Fiscal Policy; Government & Non Profit Accounting; Industrial Organization; International Economics & Trade; International Finance; Macro Economics; Micro Economics; Rural Economics; Co-operation; Demography: Development Planning; Development Studies; Applied Economics; Development Economics; Business Economics; Monetary Policy; Public Policy Economics; Real Estate; Regional Economics; Political Science; Continuing Education; Labour Welfare; Philosophy; Psychology; Sociology; Tax Accounting; Advertising & Promotion Management; Management Information Systems (MIS); Business Law; Public Responsibility & Ethics; Communication; Direct Marketing; E-Commerce; Global Business; Health Care Administration; Labour Relations & Human Resource Management; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; International Relations; Human Rights & Duties; Public Administration; Population Studies; Purchasing/Materials Management; Retailing; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Technology/Innovation; Tourism & Hospitality; Transportation Distribution; Algorithms; Artificial Intelligence; Compilers & Translation; Computer Aided Design (CAD); Computer Aided Manufacturing; Computer Graphics; Computer Organization & Architecture; Database Structures & Systems; Discrete Structures; Internet; Management Information Systems; Modeling & Simulation; Neural Systems/Neural Networks; Numerical Analysis/Scientific Computing; Object Oriented Programming; Operating Systems; Programming Languages; Robotics; Symbolic & Formal Logic; Web Design and emerging paradigms in allied subjects.

Anybody can submit the **soft copy** of unpublished novel; original; empirical and high quality **research work/manuscript** ***anytime*** in ***M.S. Word format*** after preparing the same as per our **GUIDELINES FOR SUBMISSION**; at our email address i.e. infoijrcm@gmail.com or online by clicking the link **online submission** as given on our website (***FOR ONLINE SUBMISSION, CLICK HERE***).

GUIDELINES FOR SUBMISSION OF MANUSCRIPT

1. **COVERING LETTER FOR SUBMISSION:**

DATED: _____

THE EDITOR
IJRCM

Subject: **SUBMISSION OF MANUSCRIPT IN THE AREA OF _____.**

(e.g. Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/Education/Engineering/Mathematics/other, please specify)

DEAR SIR/MADAM

Please find my submission of manuscript entitled '_____' for possible publication in your journals.

I hereby affirm that the contents of this manuscript are original. Furthermore, it has neither been published elsewhere in any language fully or partly, nor is it under review for publication elsewhere.

I affirm that all the authors have seen and agreed to the submitted version of the manuscript and their inclusion of names as co-authors.

Also, if my/our manuscript is accepted, I/We agree to comply with the formalities as given on the website of the journal & you are free to publish our contribution in any of your journals.

NAME OF CORRESPONDING AUTHOR	:
Designation	:
Institution/College/University with full address & Pin Code	:
Residential address with Pin Code	:
Mobile Number (s) with country ISD code	:
WhatsApp or Viber is active on your above noted Mobile Number (Yes/No)	:
Landline Number (s) with country ISD code	:
E-mail Address	:
Alternate E-mail Address	:
Nationality	:

NOTES:

a) The whole manuscript is required to be in ***ONE MS WORD FILE*** only (pdf. version is liable to be rejected without any consideration), which will start from the covering letter, inside the manuscript.
b) The sender is required to mention the following in the **SUBJECT COLUMN** of the mail:
New Manuscript for Review in the area of (Finance/Marketing/HRM/General Management/Economics/Psychology/Law/Computer/IT/ Engineering/Mathematics/other, please specify)
c) There is no need to give any text in the body of mail, except the cases where the author wishes to give any specific message w.r.t. to the manuscript.
d) The total size of the file containing the manuscript is required to be below **500 KB**.
e) Abstract alone will not be considered for review, and the author is required to submit the complete manuscript in the first instance.
f) The journal gives acknowledgement w.r.t. the receipt of every email and in case of non-receipt of acknowledgment from the journal, w.r.t. the submission of manuscript, within two days of submission, the corresponding author is required to demand for the same by sending separate mail to the journal.
g) The author (s) name or details should not appear anywhere on the body of the manuscript, except the covering letter and cover page of the manuscript, in the manner as mentioned in the guidelines.

2. **MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

3. **AUTHOR NAME (S) & AFFILIATIONS:** The author (s) **full name**, **designation**, **affiliation** (s), **address**, **mobile/landline numbers**, and **email/alternate email address** should be in italic & 11-point Calibri Font. It must be centered underneath the title.

4. **ACKNOWLEDGMENTS:** Acknowledgements can be given to reviewers, funding institutions, etc., if any.

5. **ABSTRACT**: Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain the background, aims, methods, results & conclusion in a single para. Abbreviations must be mentioned in full.

6. **JEL CODE**: Provide the appropriate Journal of Economic Literature Classification System code (s). JEL codes are available at **www.aeaweb.org/econlit/jelCodes.php**

7. **KEYWORDS**: JEL Code must be followed by a list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

8. **MANUSCRIPT**: Manuscript must be in ***BRITISH ENGLISH*** prepared on a standard A4 size ***PORTRAIT SETTING PAPER***. It must be prepared on a single space and single column with 1" margin set for top, bottom, left and right. It should be typed in 8 point Calibri Font with page numbers at the bottom and centre of every page. *It should be free from grammatical, spelling and punctuation errors and must be thoroughly edited*.

9. **HEADINGS**: All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

10. **SUB-HEADINGS**: All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

11. **MAIN TEXT**: The main text should follow the following sequence:

INTRODUCTION
REVIEW OF LITERATURE
NEED/IMPORTANCE OF THE STUDY
STATEMENT OF THE PROBLEM
OBJECTIVES
HYPOTHESES
RESEARCH METHODOLOGY
RESULTS & DISCUSSION
FINDINGS
RECOMMENDATIONS/SUGGESTIONS
CONCLUSIONS
LIMITATIONS
SCOPE FOR FURTHER RESEARCH
REFERENCES
APPENDIX/ANNEXURE
It should be in a 8 point Calibri Font, single spaced and justified. The manuscript should preferably not exceed ***5000 WORDS***.

12. **FIGURES & TABLES**: These should be simple, crystal clear, centered, separately numbered & self explained, and **titles must be above the table/figure**. **Sources of data should be mentioned below the table/figure**. It should be ensured that the tables/figures are referred to from the main text.

13. **EQUATIONS/FORMULAE**: These should be consecutively numbered in parentheses, horizontally centered with equation/formulae number placed at the right. The equation editor provided with standard versions of Microsoft Word should be utilized. If any other equation editor is utilized, author must confirm that these equations may be viewed and edited in versions of Microsoft Office that do not have the editor.

14. **ACRONYMS**: These should not be used in the abstract. The use of acronyms is elsewhere is acceptable. Acronyms should be defined on first use in each section: Reserve Bank of India (RBI). Acronyms should be redefined on first use in subsequent sections.

15. **REFERENCES**: The list of all references should be alphabetically arranged. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow **Harvard Style of Referencing**. Also check to make sure that everything that you are including in the reference section is cited in the paper. The author (s) are supposed to follow the references as per the following:

- All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- Use (**ed.**) for one editor, and (**ed.s)** for multiple editors.
- When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- For titles in a language other than English, provide an English translation in parentheses.
- Headers, footers, endnotes and footnotes may not be used in the document, but in short succinct notes making a specific point, may be placed in number orders following the references.

PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:

BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

UNPUBLISHED DISSERTATIONS

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

ISSUES OF WOMEN EMPLOYEES IN GARMENT FACTORIES - RELATED TO WORK PLACE PRESSURE AND FAMILY ENVIRONMENT

DR. J. THIRUMARAN
DEAN (ACADEMIC)
RAHINAM COLLEGE OF ARTS AND SCIENCE
COIMBATORE

ABSTRACT

Work–life balance is a concept which includes proper prioritizing between 'work' and 'life' (Health, happiness, leisure time, family etc.). It requires attainment of equilibrium between professional work and personal work, so that it reduces roughness between professional and personal life. Finding a suitable balance between work and daily living is a challenge that all workers face. Families are particularly affected. Work is taking over the lives of many of us in today's fast-paced, global environment, and if we do not guard ourselves against work–life imbalance, there could be increasing work–family conflicts and stress resulting from long hours and workload escalation. The objective of this study is to measure job satisfaction and work life balance of working women employees of garment industries of Tirupur. This study conducted with 100 women workers. Data has been analysed with the help of descriptive statistics and correlation analysis by SPSS.

KEYWORDS

Work Life Balance, Reduced Work Schedule, Quality Family Tim, Shorter Vacations, Flexible Work Arrangements.

INTRODUCTION

The Quality of Work depends on the Quality of Work Life. It has been clear that one can accomplish his mission and provide the level of service the public demands only if we recruit and retain the best and the brightest and provide them with a work environment that supports them in getting their jobs done. Professional life and personal life are the two sides of the same coin. Traditionally to manage work life was considered to be a woman's issue. But now days, scenario has been changed increasing work pressures, globalization and technological advancement have made this issue associated with both the gender. To achieving "work-life balance" is not as trouble-free as it sounds. To maintain the balance between the two factors work life and personal life are becoming vital as they both are mutually connected and are mutually dependent on each other. Flexible Work Arrangements (FWAs) alter the time and/or place that work is conducted on a regular basis - in a manner that is as manageable and predictable as possible for both employees and employers. FWAs provide:

Review of Literature: Nadeem and Abbas (2009) analysed the relationship between work life conflict and job satisfaction in Pakistan. Findings reveal that job satisfaction is negatively correlated with work to family interference and family to work interference. **Rani, Kamalanabhan and Selvaran (2010)** assessed empirically the relationship between work life balance and employee satisfaction. Findings of the study suggest that high correlation exist between work life balance and employee satisfaction. **Saif, Malik and Awan (2011)** examined the relationship between work life balance and job satisfaction. Finding of the research reveals that work life balance and job satisfaction are strongly correlated. Also, there are no significant differences between three levels of management in context to work life balance and job satisfaction. **Ueda (2012)** aimed to find the relationship between work life balance and job satisfaction and whether this relationship is moderated by employee income. Results of the research show that work life balance is closely related to job satisfaction.

Maera, Pitarelli and Cangiano (2013) explored the study to find the relationship between work life balance and job satisfaction. Results of the study have shown that high correlation exist between work life balance and job satisfaction.

OBJECTIVES OF THE STUDY

Following objectives has been undertaken for the study:

1. To study the issues of Women Employees in Garment Factories - Related To Work Place Pressure and Family Environment
2. To study the relationship between job satisfaction and work life balance of women employees.
3. To suggest strategies to maintain a good work life balance

RESEARCH METHODOLOGY

This study used a descriptive survey design. A thorough review of literature was conducted before selecting the topic of the study. In this study, we focused on understanding the factors affecting quality of working life. A good methodology works as a strong plan for collecting both primary and secondary data. This section explains the methods used to carry out the study, giving special emphasis to the treatment and techniques used to analyse the data.

SAMPLE SELECTION & RESPONSE RATES

This study is chosen to focus on work-life balance to one of these most popular destinations: India's Banian city Tirupur and its district. Tirupur is an Important Trade Centre of India which is famous for knitted garment wears. It is situated near Coimbatore which is known as the Manchester of South India. Tirupur is a major source of Foreign Exchange for the country because of its exports. It is famous for the export of all Knitted garment wears such as T-Shirts , Polo-Shirts, Sweat Shirts, Banians, Pyjamas, and Night Dresses on various Fabrics like Single Jersey, Interlock, Fleece, Polar Fleece, Pique Jersey, Pointelle Jersey, RIB, Pointelle RIB, Drop Needle etc.

RESEARCH DESIGN

The data to be collected can be of two types – Primary and Secondary.

Primary sources consisted of:

- Questionnaire- It is a structured technique for data collection which consists of a series of questions, written or verbal that a respondent answers. In this research, closed ended questions were used for analysis. The primary sources of data include a structured questionnaire.
- Personal Interviews- Employees were interviewed personally. Questions related to the questionnaire were asked. Other than that points which were not clear from the responses in questionnaire were asked.

Secondary sources consisted of various research papers, books, and web resources. The details of these sources have been mentioned in the bibliography.

SAMPLING

A sample is a subgroup of the elements of the population selected for participation in the study.

- Sample size: Sample size is 100.
- Sample unit: The sample unit includes only women. Employees of various garment units of Tirupur.

DATA ANALYSIS TOOLS

The data is analysed by using the SPSS descriptive statistics.

FACTORS CONSIDERING WHILE LOOKING FOR A JOB

TABLE 1

Sl.No	Not Important	Quite Important	Important	Very Important	Not Applicable
Salary/Wages	0	35	30	35	0
Location of workplace	4	26	40	21	9
Holidays	9	27	37	17	10
Interest in job	16	32	25	19	8
Career development prospect	17	48	30	5	0
Flexible working Hours	21	38	22	18	1
Leave Arrangement (Casual, Academic, Sick, Maternity/Parental etc.)	18	50	25	6	1
Training opportunities	13	27	40	17	3
Job security	4	30	42	24	0
Friendly Environment	20	41	25	13	1

- The above table shows that 35% women employees felt that salary and wages are quite important and no one opined it is not important.
- The above table shows that 40% of the employees agree that location of workplace is important.
- Almost 90% of employee enjoys their holidays while spending happy times at work.
- The above table reveals that 25% of the women employees agree that Interest in job is important.
- The analysis shows that 48% of the women employees told that career development prospect is quite important.
- The above table shows that 50% of the employees strongly agree that the leave arrangement is important factor.
- From the above table it is understood that 13% of the women Employees agree that the training opportunities play vital role.
- Above table also suggests that 42% employees strongly agree that the job security is important.
- The analysis shows that 20% of the women employees opined that the friendly environment is not so important.

THE EXTENT DOES YOUR FAMILY LIFE AND FAMILY RESPONSIBILITIES INTERFERE WITH YOUR PERFORMANCE ON YOUR JOB IN ANY OF THE FOLLOWING WAYS?

TABLE 2

Statements	SA	A	NAND	DA	SDA
Family matters reduce the time you can devote to your job	38	46	11	3	2
Family worries or problems distract you from your work	31	37	16	15	1
Family activities stop you getting the amount of sleep you need to do your job well	13	27	40	17	3
Family obligations reduce the time you need to relax or be by yourself	23	30	22	20	5
Your job reduces the amount of time you can spend with the family	26	38	23	12	1
Problems at work make you irritable at home.	20	41	25	11	3
Your work involves a lot of time away from home	30	40	23	6	1
Your job takes up so much energy you don't feel up to doing things that need attention at home	26	36	30	7	1

- The study shows that 46% of the respondents are agree that the Family matters reduce the time they can devote to their job and only 2% of them disagree the fact.
- The research reveals that 31% of the women employees strongly agree that Family worries or problems distract them from their work and 37% respondents agree this statement. And, only 1% respondents are expressed their strong disagree.
- The analysis shows that 40% of the women employee neither agree nor disagree that Family activities stop them getting the amount of sleep you need to do their job.
- The above table shows that 23% of the employees strongly agree that Family obligations reduce the time they need to relax or be by them self and, 30% agrees on this opinion.
- From the above table it is revealed that 26% of the women employees strongly agree that their job reduces the amount of time you can spend with the family
- Above table also suggests that 26% employees strongly agree that their job reduces the amount of time they can spend with the family where as 38% agree on this opinion. And, 1% dis agree on this aspect.
- The analysis shows that 20% of the women employees strongly agree that Problems at work make them irritable at home and, 41% agree that they are personally developing themselves, where as 3% strongly disagree on this point.
- The above table shows that 30% of the employees strongly agree that their work involves a lot of time away from home. 40% agree on this opinion, where as 1% employees strongly disagree that they have flexibility and freedom in the job.
- The above table shows that 26% of the employees strongly agree that their job takes up so much energy they don't feel up to doing things that need attention at home.

Now day's organizations have realized the significance and importance of the concept work-life balance and its importance in the efficiency of the employees so that neither their work nor the employee's personal life is affected.

FINDINGS & RECOMMENDATIONS

The research shows that in many cases (70%) the employee are aware of the requirements of their home care. Organizations need to take steps to develop a healthy work culture, which has a very important bearing on the work of employees, more so in challenging times. Flexible Work Arrangements need to become an integral part of culture of an organization. Since women are becoming more ambitious, money is not the only factor important for them. They are driven more by empowerment, which comes from education. The trend from western countries shows that women cannot and should not be expected to be who they were 20 years back. If issues affecting women are not considered on a quick basis, the trends of western countries are sure to become a part of India also. For e.g. deciding to get married relatively late and either having children late or deciding not to have children. Women also expect support from spouse in household chores. Strangely, this is one trend which has not caught pace and if such development can take place it will surely imply great support for women.

CONCLUSION

We hear much about the changing nature of families as we enter the 21st century. Less often do we attend to the substantial transformations occurring in the way we are working? Just as flexibility in family processes diminishes potential family stress, flexibility in work processes can help employees manage the contemporary stresses associated with balancing work and family demands. In fact, this study empirically documents how greater flexibility in the timing and location of work decreases employees' sense of stress at meeting the needs of work and family. Data such as these can reinforce management's efforts to provide greater flexibility in the workforce, especially when the results are so clear and the costs of such efforts are relatively small. Just as important, these data may help encourage employees to take advantage of the flexibility that is increasingly offered so that they can more effectively care for their families. As more companies offer flexibility in the timing and location of work and more individuals use that flexibility, the work-family imbalance that was problematic for employees in the twilight of the 20th century can become the balance so many seek in the 21st century. It is rightly said that change is the only constant thing in today's time, be it in any sphere of life. If organizations want to retain the best of their female employees, it is evident that Flexible Work Assignments have a very important role to play for the same purpose. Rather than avoiding such welcome changes organizations need to study the trade-offs carefully. The additional costs incurred on such policies are expected to pay off if tracked on a regular basis, benefits such as employee retention, higher morale and better productivity.

REFERENCES

1. Beach, J. and Friendly, M. “Trends & Analysis – Early Childhood Education and Care in
2. Canada in 2004,” Toronto: Childcare Resources and Research Unit, 2005.
3. Beauchesne, Eric. “Middle-Age Stress Hits Women Hard at Work,” Worries about family, debt. National Post, Ottawa: August 31, 2005.
4. Bibby, Reginald, “The Future Families Project: A survey of Canadian Hopes & Dreams” The Vanier Institute of the Family. http://www.vifamily.ca/library/future/future.html
5. Child Care Resource and Research Unit, “Building a Firm Foundation for Lifelong
6. Learning: The Importance of Early Childhood Education and Care,” Child Care Briefing Notes, Toronto: Centre for Urban and Community Studies, 2002 Coleman, Ronald. “The Economic Value of Unpaid Housework and Child Care in Nova

ANDROID BASED EMERGENCY ALERT BUTTON

N.SENDHIL KUMAR
HEAD
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

A. SANDYA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

A. SHAMILI
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Android is a java based working framework which runs on the Linux 2.6 part. It's lightweight and full included. Android applications are produced utilizing Java and can be ported to new stage effectively in this manner cultivating immense number of helpful portable applications. This paper portrays about a SOS application being produced and its effective usage with tried results. The application has target clients those segments of the individuals who shockingly fall into a circumstance where moment correspondence of their whereabouts gets to be vital to be educated to certain approved persons at remote end.

KEYWORDS
Gprs, SOS, Security, Android.

1. INTRODUCTION

The security of ladies around evening time and now and again even in day when voyaging alone is a worry. On 16th December, 2012 New Delhi, capital of India saw an offensive wrongdoing. A female physiotherapy understudy was beaten and group assaulted by six persons. The rescue vehicle and other administration had come to the spot late ruining crisis medicinal treatment. It has been watched that on occasion the moment correspondence of message of one's whereabouts unequivocally is an issue. This paper depicts about a SOS application grew in android stage. The uniqueness of this application separated from different SOS application accessible is that the client requires not invested energy exploring inside the telephone menu; open the screen, to trigger the administration. He rather, can specifically press the force catch and along these lines, appearing a SOS screen and client can straightforwardly click the SOS catch setting off the application out of sight, sending the area (scope and longitude) to all the preregistered telephone numbers in the application. Numerous applications accessible in the business sector sends a custom message to the number enlisted yet not the area of the client. In the proposed and tried application the longitude, scope data and the general thought of the spot (BTS area region) of the current position of the versatile client is added with the custom message that had been at first set in the application and is transmitted to the telephone numbers enrolled. This highlight of the application not just aides in discovering the careful area of the individual in issue additionally will help the police to follow the area of occurrence at last time effortlessly.

2. OBTAINABLE ANDROID SOS RELEVANCE

There are parcel numerous android applications accessible in the web today. Some are free and numerous need to be acquired. A percentage of the SOS based Android Applications are recorded underneath.

A. SOS EMERGENCY SUPPORT PREPARED BY AMERICAN RED CROSS

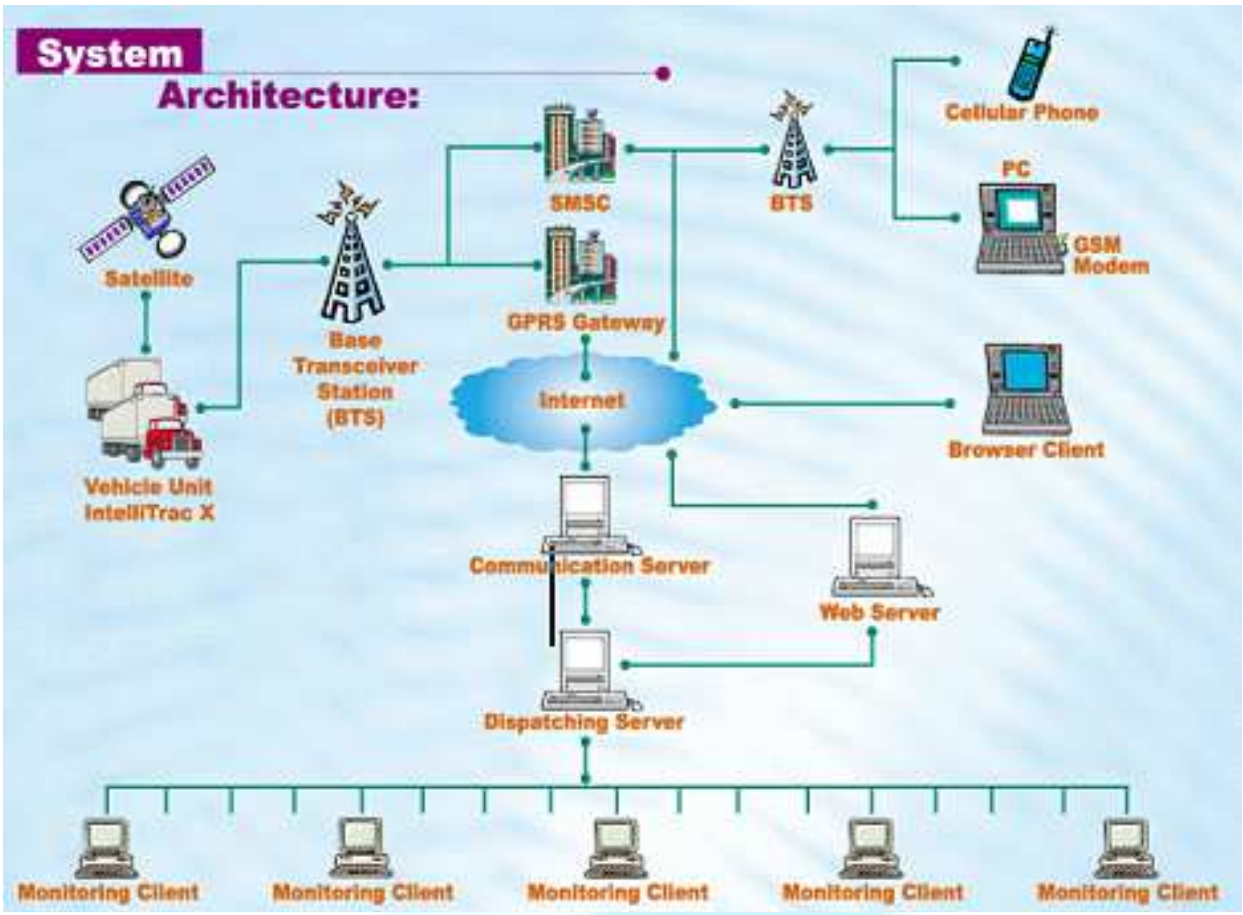
This application gives regulated guidelines on managing a mixed bag of crises, including gagging, broken bones, strokes, hypersensitive responses and numerous more. It is sans an application. It gives many features to mentor an individual through crisis conventions. Simple access to 9-1-1.If an individual is not from the US, the application will figure out what nation the individual is in and dial the fitting number.

B. OLALASHE EMERGENCY ALERT BUTTON (SOS)

Olalashe Emergency SOS is a crisis SOS application. It permits entering in the event of crisis contact from phonebook. Send SMS to contact enlisted that the client is in a bad position. Click the gadget catch to trigger the application.

3. SYSTEM ARCHITECTURE

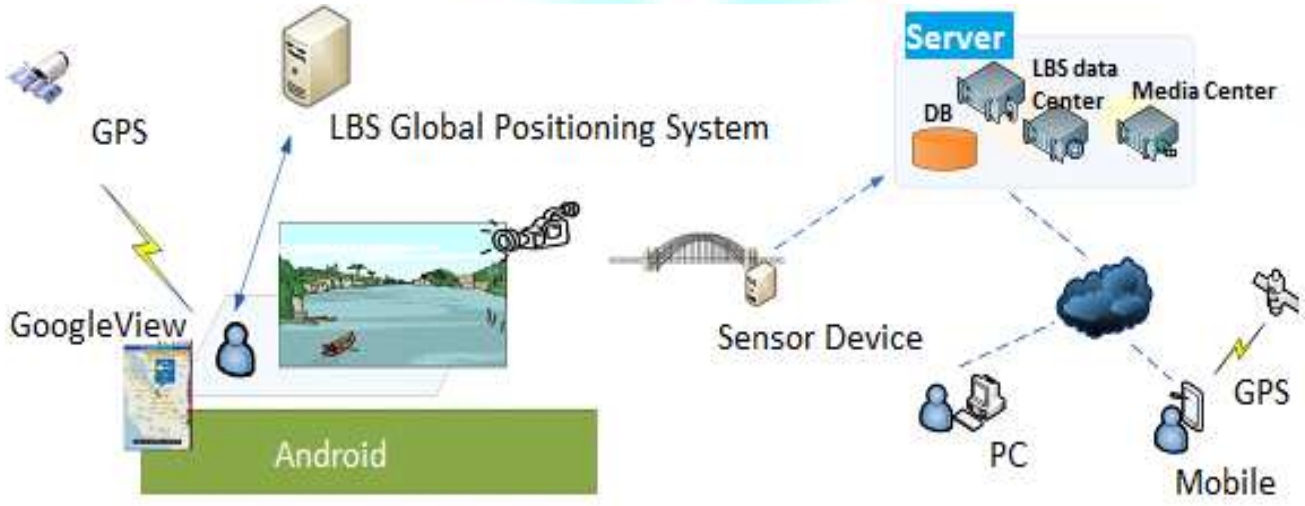
FIG. 1



4. PROPOSED MODEL

The proposed model is planned and actualized with the target that it must be easy to understand and activating of the application ought to take slightest time. The area of the client in issue ought to likewise be decisively known to each one of those persons whom message has been sent. The proposed model is indicated in the figure 1 underneath. The SOS catch is shown in the home screen of the portable to keep away from exercise in futility route to the application put away some place else. Squeezing the SOS catch triggers the application out of sight and instantly the area of the client regarding scope, longitude and general data of the spot the client is as of now in is send consequently to the enlisted crisis telephone numbers in the application. The application for full working requests GPS administration to be accessible in the handset. On the off chance that the handset don't have GPS administration, endeavor to trigger this application will demonstrate a mistake message, yet sending a sms to the enrolled telephone numbers. This highlight is exceptionally helpful taking those clients who don't have GPS empowered handset. In the event that the client is not setting off the SOS catch then the default home screen of the versatile nonstop to be shown.

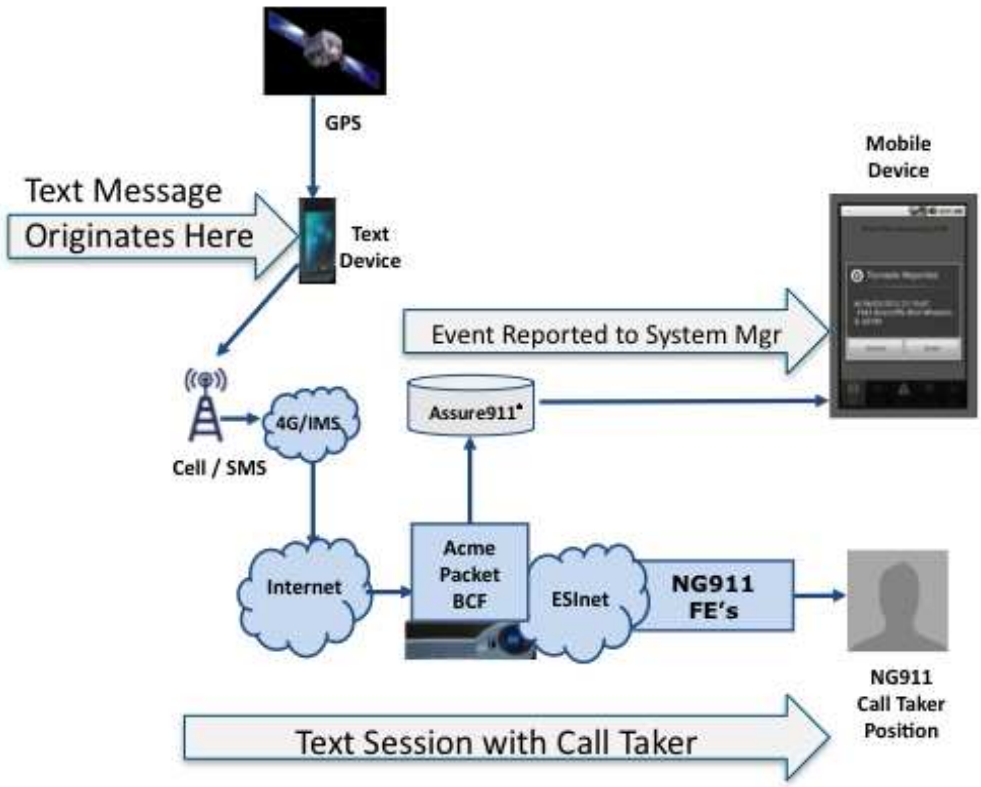
FIG. 2



5. PACKAGES USED

A portion of the bundles used to finish recovering the area utilizing GPS administrations are android. Location. Location, android. Area. Area Listener, android. Area. Area Manager and so on. The bundle utilized for sending SMS to the crisis numbers is android.telephony.SmsManager. The custom class AppPreferences.java imports inclination. Inclination Activity to spare the numbers and addPreferencesFromResource is utilized for calling the crisis numbers and recovering them from the put away index.

FIG. 3



Another custom class BroadcastSetter.java imports the android.content.BroadcastReceiver. The file displays the SOS screen above the mobile home screen.

6. TESTING AND OUTPUT RESULTS

FIG. 4

7. CONCLUSION

This application as expressed before can be of gigantic help for each one of those individuals utilizing this application. The client neither takes time to trigger the application nor the application utilizes longer time to process. The application is anticipated be fused with programmed area of the client utilizing Google Map.

REFERENCES

1. Android a programmers guide by Jerome DiMarzo.
2. Beginning Android Application Development by Wei-Meng Lee.
3. Creating Android Applications: Develop and Design ChrisHaseman
4. Hello Android Introducing Google's Mobile development Platform by Ed Burnette
5. https://play.google.com/store/apps/details?id=com.capefield.olalashe
6. https://play.google.com/store/apps/details?id=com.sharecare.sos&hl= en
7. Professional Android Application Development by Reto Meier.

REGIONAL ECONOMIC DEVELOPMENT: SELECTION OF PUBLIC PROJECTS

DR. ALEXANDER MOSESOV
ASSOCIATE PROFESSOR
BUSINESS SCHOOL
KAZAKH-BRITISH TECHNICAL UNIVERSITY
ALMATY, KAZAKHSTAN

DR. SUDHAKAR KOTA
PROFESSOR
SKYLINE UNIVERSITY COLLEGE
SHARJAH

ABSTRACT

Local (regional) public projects evaluation and selection is quite important but not well developed topic in economic development (ED). The concept of ED itself is still transforming and amended. Public projects which target intangible outcomes, such as social and cultural development initiatives, are tough to evaluate and find out their priority among each other. This paper offers one universal method to evaluate and prioritize public projects with both tangible and intangible results. Suggested model is based on widely spread among different disciplines double- or weighted-scoring methodology. It works through formulating local (regional) ED priorities, then assigning them relative importance scores and eventually evaluating projects towards compliance to the ED priorities. This method was test-run both at national (Kuwait) level, and at a regional level (South-West Nova, Canada). It proved to be a simple, but reliable tool of prioritizing of public projects.

JEL CODE
R58

KEYWORDS
Cost benefit analysis, IRR, net present value, prioritization of projects, Regional Project Evaluation.

INTRODUCTION

Project evaluation in a private sector is based purely on profitability and returns on cost factors Alapdoosh (2013), but it is not the same in the case of public projects Boardman et.al. (2013), the issue of selecting and implementing public projects is predominated by several factors, including a variety of aspects of the political, social and economic nature. Typically these include issues such as efficiency in the use of existing resources, improvement of accessibility, environmental quality and safety etc.

At the same time genuine economic development (ED) criteria in many cases contradict to goals of the profit-maximizing ventures, for example: extra employment and income generation constitute ED benefit, but an extra cost to businesses.

International, national, regional and local ED agencies work on developing effective methodologies to give objective orientation to investments and funding. In this paper an attempt is made to summarize existing experience and come up with a more or less universal methodology of evaluation and prioritization of public projects.

A double-scoring (weight-scoring) method is designed which incorporates any level of communal (local to national) priorities and the selection of public projects so that objectivity is maintained purely on the rationality of priority ranking. This method would be more meaningful to serve the community on need basis and increase their satisfaction.

LITERATURE REVIEW

Project evaluation has been an important area in the businesses. However its importance has increased from the time foreign aid has flown into government projects because for approvals from the international financial agencies it is important to select the most important project that is viable and benefits the society. These projects in a way have become cost vs benefit evaluation at the time of selecting the project itself. Secondly the funding agencies have begun evaluation on objective basis. Prioritization is a way of dealing with the economics of projects: first how do we allocate limited resources to maximize benefit? Schedlbauer (2011). Second, scope of the project is determined, third, determine which ones are more important than others. As far back as 1973, Mak (1973) understood the relevance of prioritization in deciding project programming. He suggested that "improvements be considered as investments competing for limited resources" Mak (1973), though this was with respect to transportation sector, importance of priorities are based on need to make the maximum use of those resources even in social projects. Hill added to the argument by asserting that in the private sector, the market mechanism drives the allocation of resources. The public sector cannot rely on the market, and must therefore actively pursue a prioritization scheme Hill (1968). Mak (1973) claims that priorities are mostly established subjectively, on the basis of experience of project managers. This method leaves the selection process vulnerable to personal engineering biases and lack of holistic comprehension Mak (1973). Furthermore it lacks consistency and transparency. When applied to a large number of complex projects, it can become unmanageable Mak (1973). Similar argument is echoed in a National Cooperative Highway Research Program (NCHRP) paper from (1978) that: "Priorities established subjectively run the risk of personal engineering bias, lack of comprehensiveness, and political bias", Trigueros (2008). Furthermore, the increasing number, magnitude and complexity of the programs will soon make the subjective analysis unmanageable. A rational approach will take the "politics" out of the process of project selection, and will allow citizens and independent authorities to review and critique the system Trigueros (2008). Turochy and Willis (2006) agree, saying it clarifies "the process such that the technical information is not muddled by the political framework within which the six programming decisions are ultimately made".

The main concern of any prioritization system will be to evaluate identified projects and rank them in order of importance. The level of complexity of the project prioritization processes, though, varies greatly. The literature has described minimum conditions for consideration as an acceptable methodology.

Secondly, there is the discussion of defensibility. Turochy and Willis (2006) define a defensible procedure as one that is "open to scrutiny with respect to the data used in the process and which resultant scores or rankings assigned to projects evaluated are related to the attributes of the proposed improvements." The main concept of defensibility is in the transparency of the data, criteria, and performance measures that allow outside entities to both evaluate the process and ensure that guidelines are being followed. These two characteristics are essential to promote objectivity in project selection. Each prioritization system will be unique, although each will likely involve the following steps: selecting criteria with which to evaluate projects, creating performance measures to compute project compliance to those criteria, combining scores for each performance measure in some way, and finally ranking the projects in order of importance. The criteria selected will directly relate to the locale's concerns, but tend to correlate to the planning factors outlined in ISTEA (the Intermodal Surface

Transportation Efficiency Act of 1991) and TEA-21 (the Transportation Equity Act for the 21st Century of 1998): safety, traffic congestion, environmental impacts, among others. (Turochy and Willis 2006).

METHODOLOGY

According to mathematical theory, projects should be prioritized based on benefits and costs. Thus, a prioritization framework specifies, among other things, the types of benefits its measurement, how project benefits and costs are compared to determine priorities, and how projects are selected to maximize the value of the project portfolio. Formal methods, including value modeling and multi-attribute utility analysis, are available for creating prioritization frameworks that are well-defined, comprehensive, and avoid errors and biases. Aladpoosh, Nejati (2013).

A simple Categorical scale can be used to triage requirements that are within the scope of project selection criteria followed by numeric scale which can be applied to further prioritize the requirements that lie within scope of possible projects. Once the requirements are prioritized, the list is ordered and implementation starts with the most important ones Schedlbauer (2011).

The important methods of defining priorities are categorical, linear numeric and non- linear numeric scales. For a numeric scale, a small value means a low priority (reduced necessity and less urgency), while a large value indicates a high priority (necessary and urgent). For categorical scales, a definition of each categorical value needs to be established so that all stakeholders prioritize from the same perspective. The fig 1. Below summarizes the priority value semantics. Schedlbauer (2011)

FIG. 1 : PRIORITY VALUE SEMANTICS

Priority	Semantics
High/Critical	A critical requirement without which the product is not acceptable to the stakeholders.
Medium/Important	A necessary but deferrable requirement which makes the product less usable but still functional.
Low/Desirable	A nice feature to have if there are resources but the product functions well without it.

Source: *Requirements Prioritization Semantics*

PRIORITIZATION OF PROJECTS

Private project evaluation is a well-developed discipline Mogenson et.al. (2002). It is founded on comparisons of the cost of the project financing with its revenues or profitability. For that purposes private *project evaluation* or *capital budgeting* engages several methods and techniques, such as payback period, Net Present Value (NPV), Internal Rate of Return (IRR), etc. Parrino et.al. (2011).

Project-evaluation toolkit is hardly applicable though in case of public projects. The difference between private and public projects is in their results. Private profit-maximizing ventures bring measurable tangible monetary results (revenues, profits). In contrast, public projects in most of cases are socially oriented towards intangible results, such as health, education, and environment.

Public-sector counterpart of the capital budgeting methods and techniques used in private sector is the cost-benefit analysis (CBA) Boardman et.al. (2011). The essence of both private capital budgeting and CBA could be illustrated with the following simple Efforts-Results Grid (ERG) (also known as "Affinity Chart" or the "Hi/Lo model").

Under condition of limited resources and multiple opportunities to use these resources (projects) there are always choices to be made on their optimal allocation. If we place alternative projects on ERG, clearly priority will be assigned to ventures located in Low Effort – High Results quadrant providing highest economic efficiency. If there are still resources left a decision should be made whether next priority should be given to Low Effort – Medium Results' or rather to Medium Effort – High Results opportunities. Projects located in the dimmed area most likely will be excluded. Chart 1

CHART 1: EFFORTS – RESULTS – GRID

Efforts	***H***	*High Effort, Low Results*	*High Effort, Medium Results*	*High Effort, High Results*
	M	*Medium Effort, Low Results*	*Medium Effort, Medium Results*	*Medium Effort, High Results*
	L	*Low Effort, Low Results*	*Low Effort, Medium Results*	*Low Effort, High Results*
		L	***M***	***H***
		Results		

The problem of prioritization is in measurement of efforts versus results. Private capital budgeting enjoys total compatibility of efforts/results measurements – both are measured in time/money.

Public projects do have measurable monetary cost, but lack monetary results. The choice is quite simple in cases when alternative projects are aimed to the same results, i.e. health care. In this cases the tool of cost efficiency is used, i.e. the project providing same level of health with the least cost (or more health with the same cost) is clearly preferable.

This is impossible though, when several public projects with different targets are considered. Suppose, the choice is between a monument and a clean-up of a harbor, both cases have monetary cost, but how do we compare the results: a tourist-attracting amenity versus cleaner environment? In such cases CBA is applied to ensure that the public sector allocates scarce resources efficiently to competing public sector projects Layard, Glaister (1994).

The theoretical justification for CBA rests on the *compensation principle* which is used to assign monetary value to a public (social) good or service. Then the priorities are defined by comparing monetized benefits from a public projects with their costs. Public project is justified if gainers can fully compensate losers for their losses and still have some gain left Salvatore (1989), and the higher the gain, the higher the priority of the project.

Monetizing non-market un-priced public goods and services or contingent valuation (sometimes known as the *priority-evaluator technique* or the *stated preference model*) in its turn is based on several methods such as a survey-based willingness-to-pay (WtP) Carson (2004). All these methods and techniques are quite complicated (time-consuming) and often controversial (disputable), Quevedo et.al. (2009).

In the meantime managerial economics offers a variety of decision-making tools and methods helpful in allocating any number and assortment of public projects along the ERG. One common for many disciplines method is based on scoring of the alternatives. Scoring decision-making tools vary from simple CARVER matrix in military special operations Bennett (2007) to double-scoring (weighted-scoring) Pugh method in product design and development Pugh (1991).Among its closer applications is a directional policy matrix method in business project and portfolio analysis Friend (2009).

LOCAL/REGIONAL ECONOMIC DEVELOPMENT APPROACHES AND PROJECTS

ED strategy approaches have been gradually changing ever since Second World War. Literature distinguishes three principal phases of its transformation: the traditional approach, capacity building and a third phase focused on quality of life and flows on information Tassonyi (2005).

More generally, strategic changes in the ED are described as a shift from need-based to assets-based approaches Mahyar (2008). Need-based projects are typically business support in various forms: direct subsidies, investments, tax cuts, etc.

Under need-based approach governments used "a standard deficits calculations approach" to quantify community needs in order to take deficit reducing measures. Major players are governments and local administrations, major tools are support and direct investment to businesses, services, utilities.

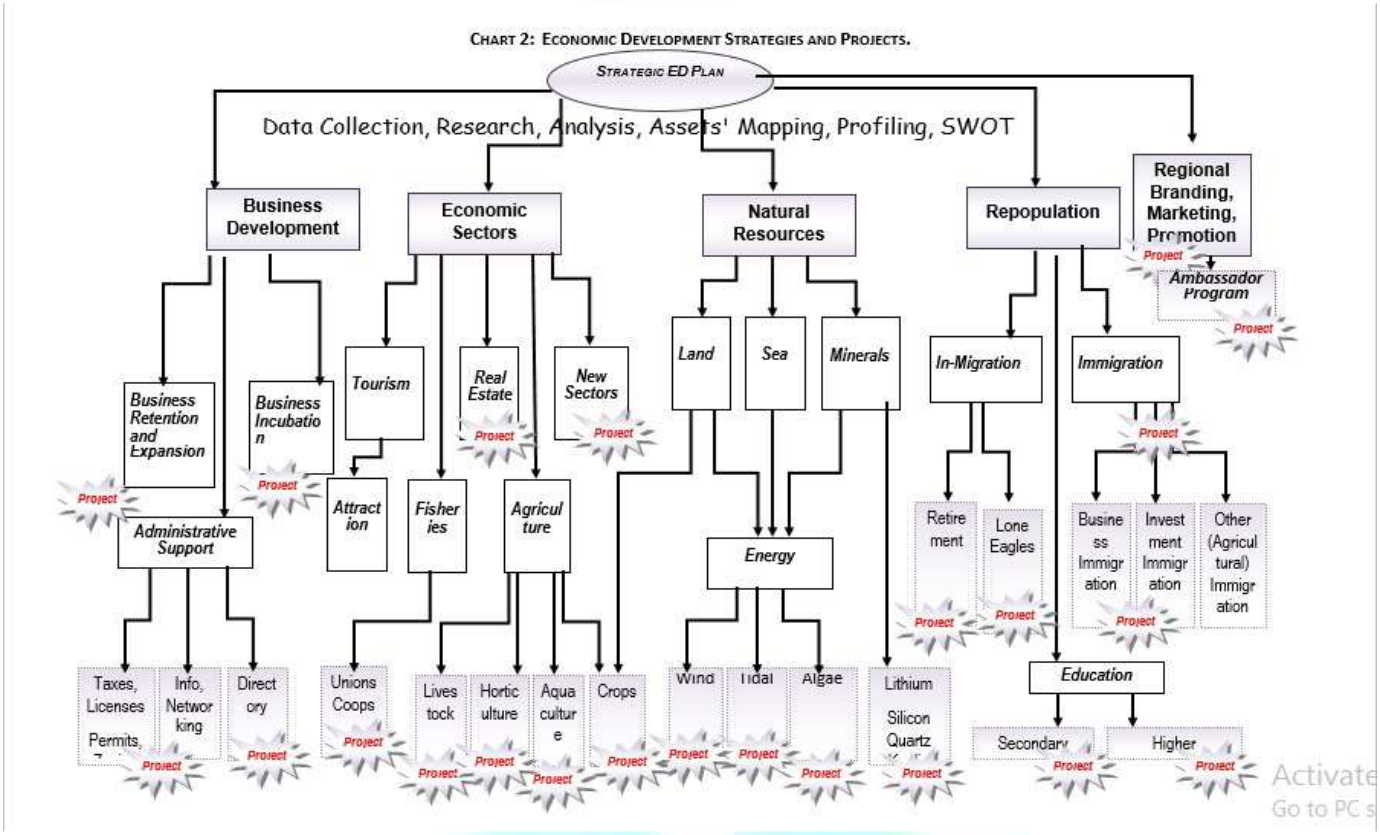
Assets-based projects are more socially-oriented projects, the typical example being "creative class" model by Florida (2004). At its core, assets-based ED focuses on various assets (human, social, financial, natural and physical) that already exist in the region, especially the formal and informal associations that mobilize assets and strengthen the social relationships that are important for bridging local initiatives to external opportunities. Major players are local communities, major tools are local initiatives.

Currently, most of local ED strategies are formulated as a mix of need-based to assets-based approaches. Any regional strategic ED planning nowadays starts with a local data collection, assets mapping, profiling, SWOT analysis. Such research identifies key possible impact areas – business, sectors, natural resources, repopulation, region's marketing in the Chart 2. Then based on success stories and positive experience of other regions each general direction is disaggregated down to the level of executable projects.

Chart 2 shows a typical list of the ED toolkit applied to local/regional ED in North America. This list is in no way comprehensive, but it is rather a first attempt to create a complete list of possible ED projects.

And at this point double-scoring (weighted-scoring) method comes in handy. There is no other methodology which would allow to compare and select between such extremes as business incubation and "lone-eagles" program Sopuck (2003).

CHART 2: ECONOMIC DEVELOPMENT STRATEGIES AND PROJECTS.



PROPOSED METHODOLOGY

As mentioned above, proposed method of regional project evaluation, prioritization and selection is based on double-scoring (or weighted-scoring) scheme of budget allocation was suggested earlier for the nation-wide project evaluation and selection Mosesov, Kota (2005). In the core of this method is assignment of the two sets of scores to current public and possible alternative choices of projects.

Similar approach is used by Canadian municipalities in their annual capital budgeting plans. Tables 1 through 3 illustrate the proposed method applied at the regional level of project selection, but it can be applied at any level of authority, from national down to municipalities and rural communities.

Double-scoring method requires assessment of two sets of scores. First set contains the list of the ED priorities ranked according to their current relative importance. This set of scores is used as weights to evaluate compliance of a particular project to the set of regional ED priorities.

Regional ED policy priorities are usually clearly spelled out in regional Strategic Plans, local Integrated Community Sustainability Plans (ICSP's) and/or other administrative documents.

In case if there is no clearly pronounced set of the ED priorities it should not be too difficult to obtain through a public survey. A questionnaire(s) containing request to assign weights of relative importance can easily be distributed among community leaders representing different interest groups and sectors. Summarizing and averaging of their responses, as well, should not be an expensive or a difficult exercise.

FIRST SET OF SCORES (Weights) evaluate local ED priorities. For the sake of simplicity, in the illustrational example only ten of potential regional ED objectives are chosen at the highest level of aggregation fig. 2, but their list may contain any number of entries, reflecting any level, scale and scope of the ED goals' disaggregation. Among them:

FIG.2: EXAMPLE OF ASSIGNING WEIGHTS TO ED OBJECTIVES

	Public Projects	*Relative Importance Ranks*
A	Advise and referral services to businesses	- 10
B	Business retention and expansion (BRE)	- 9
C	Export orientation, Import substitution	- 5
D	Financial viability, Cost efficiency	- 7
E	Income generation	- 6
F	Jobs creation	- 3
G	Population retention and expansion (PRE)	- 8
H	Priority sector development	- 8
I	Workforce development	- 4
J	Impact scale: regional, sub-regional, local	- 2

Notice, that the double-scoring method does regard considerations of cost efficiency, but only as one among several other key factors, more or less equally important to all other aspects of regional concerns. For the entry in "Financial viability, Cost Efficiency" evaluators should assign relative weight to availability of funds founded on current economic, fiscal, and monetary situation.

On the quantitative side, both sets of scores in our example are scaled from one to ten, but of course, depending on required level of differentiation, it can be set at any scale from 3:1 to 100:1. Alternatively, scoring might be based on percentages or coefficients of zero through one. In our hypothetical case indicated above weights were arbitrarily assigned with exclusively presentational purposes only.

First set of scores (weights) are presented in Table 1 as the averages of respondents' evaluations (see the column "Average").

SECOND SET OF SCORES are assigned to each of projects proposed for implementation during next fiscal year. Scoring of projects is based on their level of relevancy to each and every of the above ten regional objectives. Exemplary guidelines for scores' assigning are presented in Appendix 1. Same technique of questionnaire surveys among leading professionals, administrators, etc. will produce results presented in the Table 2.

Questionnaire surveys though are not the only possible method of assigning weights. Some scores could be derived immediately from comparable quantitative indicators. For example, net present value of the project life-cycle cost can serve as a good meter for the entry in the "Financial Viability, Cost Efficiency". Even better indicator would be a cost-benefit ratio in the cases where relative cost-benefit analysis is available.

After simple weighted averaging of project scores eventually all proposals receive ultimate score as shown in the "*Priority of the Project*" column of the Table 2. This task is without difficulty performed by any spreadsheet software using "Sort" function (see Table 3).

In Table 3 projects are re-sorted top to bottom according to their resulting total relative scores: C, B, G, H, F, A, D, E – ranking 77.1 down to 36.3 points. Selection then should be limited to those projects which fit into next year's allocated budget. The cost of project is represented by its required annual (next year) investment outlays.

Thus, this methodology allows selecting the combination of projects that maximizes achievement of regional ED objectives within the funds available in the next fiscal year. According to results in the Table 3, regional ED priorities allocate all projects in C, B, G, H, F, A, D, E succession. Under the double-scoring (weighted-scoring) method such a choice will ensure utmost feasible realization of the current ED priorities.

It is noteworthy, that Table 3 demonstrates rather high sensitivity of the method to slight changes in priorities. One point transpose in weights between social/political progress and economic growth, accompanied with two points reverse between urban and rural development produces noticeably different results, i.e. project G moves down to the bottom, while projects H and F move up the scale changing ranks significantly.

This indicates a possibility of a change in priorities with respect to projects that require several years for their development. It is possible that project picked for execution previous year will fall below scoring threshold next year. In this case it should be put on hold until change in priorities bring it back to scope in following year'(s)' evaluations (see real options' project evaluation theory). In accordance with the "real options" theory an option of abandonment or expansion of the project minimizes losses and maximizes gains in capital budgeting processes.

This is an example of how to decide a project is given with the help of key factors and the method of scoring is related with the regional ED priorities specified as in planned economies and their appropriate budgeting for the implementation of services for the benefit of stakeholders.

TABLE 1: ASSIGNING SCORES (WEIGHTS) TO THE REGIONAL ED PRIORITIES

#	*Priority\Person*	*Respondent 1*	*Respondent 2*	*Respondent 3*	*Respondent 4*	*Respondent 5*	*Respondent 6*	*Respondent 7*	*Average*
A	**Advise and referral services to businesses**	5	6	9	9	10	1	6	***7***
B	**Business retention and expansion (BRE)**	5	3	4	3	4	3	7	***4***
C	**Export orientation, Import substitution**	9	9	3	8	4	9	1	***6***
D	**Financial viability, cost efficiency**	3	3	4	6	0	2	6	***3***
E	**Income generation**	9	7	8	3	9	10	9	***8***
F	**Jobs creation**	7	3	4	1	4	3	7	***4***
G	**Population retention and expansion (PRE)**	10	9	3	8	4	9	1	***6***
H	**Priority sector development**	4	1	8	6	0	2	6	***4***
I	**Workforce development**	2	7	8	3	9	10	9	***7***
J	**Impact scale: regional, sub-regional, local**	10	10	10	10	10	10	10	***10***

TABLE 2: PROJECT EVALUATION ACCORDING TO REGIONAL ED PRIORITIES

Projects	Advise and referral services to businesses	Business retention and expansion (BRE)	Export orientation, Import substitution	Financial viability, Cost efficiency	Income generation	Jobs creation	Population retention and expansion (PRE)	Priority sector development	Workforce development	Impact scale: regional, sub-regional, local	Priority of the Project
	7	***4***	***6***	***3***	***8***	***4***	***6***	***4***	***7***	***10***	
A	4	5	10	10	9	10	6	7	3	0	***57.4%***
B	10	8	7	0	7	7	8	2	6	5	***63.3%***
C	9	10	7	10	8	9	1	10	5	10	***77.1%***
D	4	8	9	4	0	0	10	8	4	5	***50.5%***
E	1	10	7	1	6	10	0	3	3	0	***36.3%***
F	10	0	2	0	8	6	2	2	10	10	***59.8%***
G	0	3	8	10	6	1	7	10	6	10	***62.6%***
H	4	7	10	3	0	3	7	4	10	10	***62.0%***

TABLE 3: LIST OF PROJECTS REARRANGED ACCORDING TO REGIONAL PRIORITIES' SCORE

Projects	Advise and referral services to businesses	Business retention and expansion (BRE)	Export orientation, Import substitution	Financial viability, Cost efficiency	Income generation	Jobs creation	Population retention and expansion (PRE)	Priority sector development	Workforce development	Impact scale: regional, sub-regional, local	Priority of the Project
	7	***4***	***6***	***3***	***8***	***4***	***6***	***4***	***7***	***10***	
C	9	10	7	10	8	9	1	10	5	10	***77.1%***
B	10	8	7	0	7	7	8	2	6	5	***63.3%***
G	0	3	8	10	6	1	7	10	6	10	***62.6%***
H	4	7	10	3	0	3	7	4	10	10	***62.0%***
F	10	0	2	0	8	6	2	2	10	10	***59.8%***
A	4	5	10	10	9	10	6	7	3	0	***57.4%***
D	4	8	9	4	0	0	10	8	4	5	***50.5%***
E	1	10	7	1	6	10	0	3	3	0	***36.3%***

CONCLUSIONS

Decision methods on budgeting under capital rationing are well established primarily for a private sector.

Public sector projects are usually evaluated based on quantification of intangible costs and benefits which involves difficulties of monetization of non-marketed indirect benefits and costs.

Double-scoring (weight-scoring) method is suggested for this case rather common for public authorities. Evaluation and ranking among projects is accomplished through assignment of weights to each project. These weights reflect level of correspondence of each particular project towards accomplishment of regional ED priorities.

This method was test-run both at national (Kuwait) level, and at a regional level (South-West Nova, Canada). It proved to be a simple, but reliable tool of prioritizing of public projects. The model is applicable at all levels of public administration from a community to a nation as well as internationally.

LIMITATIONS

Particular difficulty is in budget allocation between public projects of complete difference, such as projects addressing environmental, educational, or health problems. While costs in all cases are clearly spelled by investment outlays, benefits of better education vs. cleaner environment are hardly comparable.

SCOPE FOR FURTHER RESEARCH

Scope for further research exists in environmental, education and health sectors projects where more than tangible benefits qualitative benefits are visible and most of the times the gestation gaps between the project implementation and realization of benefits take long period. It can be tested whether this analysis is able to evaluate the benefit related project prioritization. Comparative studies between projects in developed and under developed regions would be interesting.

LIST OF ABBREVIATIONS

ED	Economic Development
CBA	Cost Benefit Analysis
ERG	Efforts-Results Grid
WtP	Willingness-to-Pay
IRR	Internal Rate of Return
NPV	Net Present Value

REFERENCES

1. Aladpoosh H., Nejati A.A.N.Z, (2013), *"The Principles of Project Prioritization Framework,"* unpublished work.
2. Baker H.K., English P., (2011) "*Capital Budgeting Valuation: Financial Analysis for Today's Investment Projects."* John Wiley & Sons, Inc., pp 518. ISBN: 978-0-470-56950-4.
3. Bennett B.T. (2007), *Understanding, Assessing, and Responding to Terrorism,: Protecting Critical Infrastructure and Personnel.* John Wiley & Sons, New York. ISBN 0-471-77152-X
4. Boardman E.A., Greenberg D.H, Vining A.R, Weimer D.L., (2010), *Cost-Benefit Analysis: Concepts and Practice,* 4th Edition, Pearson Prentice Hall, pp 541. ISBN: 0137002696.
5. Carson R.T (2004), *Contingent Valuation: A Comprehensive Bibliography and History,* Edward Elgar Publishing, pp 455, ISBN 987 1 84064 755 6.
6. Florida R. (2004), *The Rise of the Creative Class.* Westview Press Basic Books, pp 434 pp. ISBN-10: 0465024777, ISBN-13: 978-1864032567.
7. Friend G., Zehle S., (2009), *Guide to Business Planning,* 2nd Edition Revised, London, Profile Books Ltd, 2009 – pp.282 - ISBN: 978-1-57660-328-4.
8. Layard R.; Glaister S., (1994), "*Cost-Benefit Analysis*." 2 ed., Cambridge University Press, pp 508 ISBN 0521461286.
9. Mahyar A., (2008), "An Asset-based Approach to Community Development and Capacity Building. The Human Settlements Financing Tools and Best Practices Series." UN-HABITAT, Nairobi, pp 51. ISBN: 978-92-132000-8
10. Mak, K. K. (1973), "*Priority Analysis for Ranking of Transportation Improvement Projects - A Proposed Procedure,"* Georgia Institute of Technology, Atlanta, GA.
11. May A.D., (1991): "*Integrated Transport Strategies: A New Approach to Urban Transport Policy Formulation in the UK transport reviews"* pp. 11 (3), cited in Gercek H., Karpak B., Kilincaslan T., (2004) : *A Multiple Criteria Approach for the Evaluation of Rail Transit Networks in Istanbul,* pp 1, Kluwer Academic Publishers, Netherlands. Transportation 31, 2, pp 203-228,
12. Morgenson G., Harvey C.R, (2002), *The New York Times Dictionary of Money and Investing: The Essential A-to-Z Guide to the Language of the New Market*. Publisher: Henry Holt & Company, pp400. ISBN 080506933X / 9780805069334.
13. Mosesov, A.; Kota, S. (2005), "Public Project Evaluation and Selection." v.2, # 1, pp13. *Skyline Business Journal*. ISSN 1998-3425.
14. Pugh S. (1991), *Total Design - Integrated Methods for Successful Product Engineering.* Addison Wesley Publishing, NY. ISBN 0-201-41639-5.
15. Quevedo J., Mould F., et al., (2009), El concepto de willingness-to-pay en tela de juicio. Revista de Saúde Pública. vol.43 no.2 São Paulo Apr. 2009 ISSN 0034-8910
16. Robert Parrino, Peter Moles, David S. Kidwell (2011), *Fundamentals of Corporate Finance*." 2nd Edition, John Wiley & Sons pp 784. ISBN 978-0-470-87644-2.
17. Salvatore D., *Schaum's Outline of Managerial Economics,* (1989), McGraw-Hill. Inc., pp 300.ISBN:0070545138.

18. Samad H.A, Khandker S.R., Koolwal G.B., (2009), "*Handbook on Impact Evaluation,"* (World Bank Training Series) [Kindle Edition], pp 262. World Bank Publications, 1 edition, ISBN: 0821380281.
19. Schedlbauer M., (2011), *"Requirements Prioritization Strategies",* Project Times.
20. Sopuck, Robert (2003). *"The Lone Eagles: Information Professionals and Rural Economic Development."* Policy Series No. 19. The Frontier Centre for Public Policy series Report, pp 16. ISSN 1491-7874
21. Tassonyi, A.T. (2005), "*Local Economic Development*: *Theory and the Ontario Experience."* ITP Paper No.0511, Toronto, Ontario, Canada. University of Toronto Rothman School of Management Institute for International Business, pp 22 .
22. Trigueros M.A., (2008), *"An Analysis of Project Prioritization Methods at the Regional Level in the Seventy-Five Largest Metropolitan Areas In The United States Of America."* Thesis submitted to Georgia University of Technology, pp 4-8.
23. Turochy, R. E., and Willis, J. R. *"Procedures for Prioritizing Proposed Transportation Improvements at the Metropolitan Level."* Transportation Research Board 85th Annual Meeting, Washington, D.C.

APPENDIX

Exemplary **Guidelines for Project Evaluations' Scoring**

There are two major approaches depending on whether criteria of scoring are quantifiable or not.

Quantitative scores are based on corresponding profile indicators:

1. *"Income generation"*:

Based on median income and size of business. With median income in the area of approximately $30,000 and size of business of around 10 employees, generation of $300,000 in annual salaries per business could be accepted as a middle point (a score of 5). Then on such a scale any business paying $600,000 and more in salaries gets a score of 10, while business paying $50,000 in salary scores the bottom 1 and so on.

2. *"Jobs creation* and *Business retention and expansion* (*BRE*)":

Based on scale of employment at local businesses. About 99% of local businesses employ from 1 to 100 workers. Hence, the number of new jobs created divided by 10 can serve as a score, for example: 20 jobs give a score of 2, 50 jobs – 5, 100 and more jobs – a score of 10.

3. *"Population retention and expansion* (*PRE*)":

Based on rates of depopulation. South West Nova has lost 2,500 residents in between two last censuses (2006-2011), or around 500 a year and 50 people per municipality. Full recovery of 50 residents then could be accepted as a 100% accomplishment, or 10 points. Correspondingly, 10 persons retention earns 2 points, 20 – 4 points, etc.

4. *"Impact scale: regional, sub-regional, local":*

Based on equal incremental increase of importance: local – 3 points, sub-regional – 6 points, regional – 10 points.

Qualitative scores are based on one of three options:

1. Criteria "***yes***" – *10 points*, or "***no***" – *0 points.* Includes:

✓ "*Advise and referral services to businesses*"
✓ "*Export orientation, Import substitution*"

2. Criteria "***yes***" – 10 points, "***somewhat***" – 5 points, or "***no***" – 0 points. Includes:

✓ "*Financial viability, cost efficiency*"
✓ "*Priority sector development*"
✓ "*Workforce development*"

DATA MINING IN KNOWLEDGE DISCOVERY PROCESS

M RANGARAJ
ASSOCIATE PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

K R APARNA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

K SYAMALA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

This paper explains about Data Mining procedure, it indicates how the same information can be getting from large set of data. This is the process of collecting data within the dataset as many conditions. There are many types of steps occurs in data mining for mining the data from the large information. This explains how the original data can be retrieving from big data. In business sectors by using this data mining process we have to work down easily from any set of information.

KEYWORDS
Data Mining, Knowledge systems, Discovery in Databases (KDD).

1. INTRODUCTION

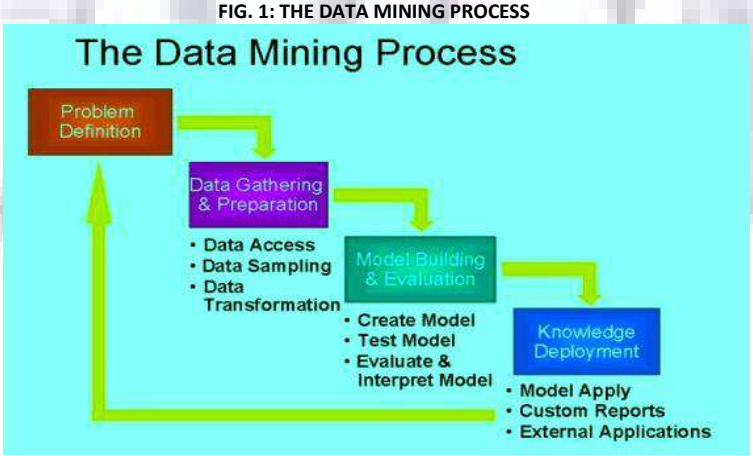
This Data mining can be applied in any kind of information which represents such as relational database, data ware house, transactional database, advanced systems, flat files and World Wide Web. Data mining is a step in KDD process concern with the algorithmic means by which patterns or structure is enumerated from the data and then acceptable computation and efficiency and limitations. Data mining, the extraction of predictive information from large database system, it is a powerful new technology with great potential to help the companies for focusing on the most important information in their data warehousing

2. ARCHITECTURE OF DATA MINING

Data mining is a process of discovering interesting knowledge from large amount of data stored in database. Data mining system is may have the following major components.

- Data base or other information system
- Data base or data ware house server
- Knowledge base
- Data mining engine
- Patterns evaluation model
- Graphical user interface

FIG. 1: THE DATA MINING PROCESS



2.1 RULES OF DATA MINING

- Data preprocessing
- involvement
- sorting and guess

- collectively study
- Social impacts of data mining
- Application and tends in data mining.

SORTING

This is the process of straightforward the form of data items made simple to recover the data easily. The process can be accessed with high speed, the errors can be eliminated in this one. it is used to construct the decision tree.

GUESS

It is the unknown data process. It is also called as fraud detection. It means in market budget analysis is not properly calculated just estimated how much of profit occurs but some cases the lose may also faces the people. At the same time weather reports. when the rain comes the clouds reactions and so on.

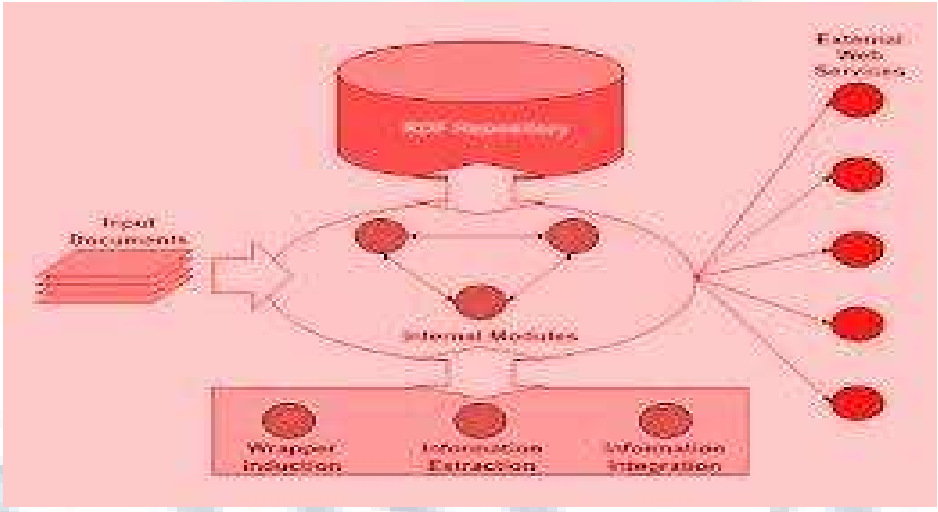
FIG. 2: THE DATA MINNIG PROCESS

2.2 WHY DATA CAN BE MINING?

The data mining is very powerful tool to retrieving the data from different data sets, in various areas we have to use data mining for their external purposes like Education, Sports, etc.Data mining is the search for the relationship and global patterns that exist in large database hidden among the vast amount of data. Data mining system itself learn from the previous history of investigated system. the following are the fundamentals of data mining

- Relational database
- Transaction database
- Data ware house
- Advanced data base
- Spatial data
- Multi dimensional database
- Graphical engineering medical and www database

FIG. 3



2.3 FUNCTIONALITIES IN DATA MINING

Data mining functionalities are use to specify the kind of patterns to be found in data mining task. Data mining tasks are classified into two categories. Descriptive and predictive. Descriptive mining task are categorize the general properties of the data in the database. Predictive mining task performs an interface on the current data in order to make a prediction.

- **DATA CHARACTERIZATION**

It is a summarization of general characteristics of a target class of data. The output of data characterization can be presented in various forms like,

- Pie charts
- Bar charts
- Curves
- Multi dimensional cubes
- Multi dimensional tables

- **DATA DISCRIMINATION**

A comparison of the general feature of target class data object with general features of the objects from one or a set of constructing classes. A discrimination descriptions are expressed in rule form is referred to as following rules.

- Association analysis.
- Classification and prediction(Decision tree, neural network, genetic algorithms, mathematical formulae)
- Cluster analysis.

- Prediction.

2.4 DIFFERENT AREAS WHERE DATA MINING IS IMPLEMENTED

The data mining is the very important area to modify the data depending on the peoples use. In different sectors data mining process are implemented. The following are some o the areas.

- Education
- Finance
- Sports
- Business
- Research
- Insurance
- Telecommunication
- Stock market… so on

3. PRE-PROCESSING IN DATA MINING

The pre-processing is a process of modification of data, we also called as Knowledge discovery in database (KDD).Knowledge discovery in database was formalized in 1989,with references to general concepts of being broad and high level of seeking a knowledge from large number of data. The KDD process tends to be highly iterative and interactive. Data mining analysis tends to work up from the data and best techniques are develop with an orientation towards a large number of volumes of data, making a use of as much data as possible to arrive at reliable conclusion and decision.

3.1. STEPS IN KDD PROCESS

The following are the some of the steps involved in KDD process.

i. DATA CLEANING: It is the process of removing a noise and inconsistent data. It is used to produce the missing values and noisy data while identifying the correct data. The manual process are implemented to clean the data in the form of different sets. The attributes are used to fill the missing terms. The random errors are occurs while cleaning the data, In that time rectify all the unwanted items. Small set of data is available in this process.In this process the lacking of data is produces at the time of cleaning.

ii. DATA INTEGRATION: It is the process of combining a data from multiple sources. The same set of data items are available, this is called redundancy of data. This is the one of the problem because the developers doesn't know which is the useful one. So they divide the data as terms and mentioned as attribute names.

iii. DATA SELECTION: It is the process of retrieving a relevant data from the database. We have to select the similar type of data in different formats, and combine all the data values. Finally select which consist of efficiency.

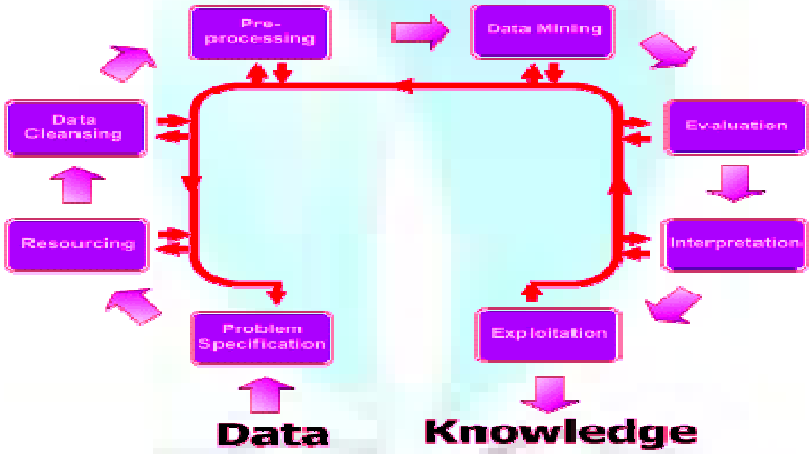
iv. DATA TRANSFORMATION: It is the process the data transform and consolidated into forms and appropriate for mining by performing a summary or aggregate operations. Data transformation process can be involved in smooth, aggregation, overview of the data, normalization and attribute structure

v. PATTERN EVALUATION: The patterns obtain in the data mining stages are converted into knowledge base on some interesting measures.

vi. **KNOWLEDGE REPRESENTATION:** Visualization and knowledge representation techniques are used to present the mind knowledge to the user.

vii. DATA MINING: It is the essential process where intelligent methods are applied in order to extract the data patterns.

FIGURE 4: THE KNOWLEDGE



3.1 PREPROCESSING IN DATA MINING

The above diagram shows the complete description about preprocessing in data mining system. How the process may run and which type of things involve in this process all those things are shown by this diagram. How the data can be transfers from one stage to another stage this can be easily identified by the user depending on the figure.

4. CONCLUSION

The focus of this paper is to provide The information about the data mining process. How the mining process can be taken place in the different process. This is useful to know the students which are focusing on data mining used to know the process.

REFERENCES

1. Anderson, C. 2004. "The Long Tail," WIRED Magazine (12:10)
2. Data Mining Explained Rhonda Delmater, Jr.,Monte Hancock
3. Data Mining: A Hands-On Approach for Business Professionals (Data Warehousing Institute Series) Robert Groth.
4. Data Mining: Concepts and Techniques Jiawei Han,Micheline Kamber
5. Fortunato, S. 2010. "Community Detection in Graphs," Physics Reports (486:3-5), pp. 75-174.

A STUDY ON IPO'S AFTERMARKET PRICE PERFORMANCE OF INDIAN CAPITAL MARKET

K. S. DEEPARANI
ASST. PROFESSOR
DEPARTMENT OF MBA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)
CHITTOOR

DR. V. GAJAPATHI
PROFESSOR
DEPARTMENT OF MBA
VEL TECH DR. RR & SR TECHNICAL UNIVERSITY
AVADI

ABSTRACT

A study on Indian Initial Public Offering is an attempt to examine the price performance of IPOs in Indian Capital Market over a four years period. The study, takes a sample of 10 Indian Initial Public offering listed on National Stock Exchange (NSE) which follows book building process. It analyzes the short-run post issue performance of selected IPO firms in Indian capital market, for an interval of 6 months as short run analysis of underpricing. Offer price of the issue is determined on the basis of market feedback. Therefore, the present study is an attempt to investigate into the pricing phenomenon and the Short-run performance of IPOs in Indian capital market during the period beginning from 2010 to 2013. After IPO issue most of the stock are underpriced which goes to negative returns during the 6months periods, it has given high standard deviations on 3rd month in the study period The test results found that there is no signifance for stock returns except one stock i.e., Indo Thai Securities (0.38) at 5% and there is no single got significant market returns.

KEYWORDS
IPO, Short run analysis, Offer price and Market feedback.

1. INTRODUCTION

An Initial Public Offering (IPO) is a critical moment for a company. A firm going public relies on the capital raised in its IPO to grow and thrive. The stakes also are high for other parties. Investors can reap huge profits or sustain big losses. For the firm's owners and managers, as well as the venture capitalists with a stake in the firm and the investment bankers who underwrite the sale, careers and fortunes can be made. A company selling common shares is never required to repay the capital to its public investors. Those investors must endure the unpredictable nature of the open market to price and trade their shares. After the IPO, when shares trade freely in the open market, money passes between public investors. For early private investors who choose to sell shares as part of the IPO process, the IPO represents an opportunity enhance their investment. After the IPO, once shares trade in the open market, investors holding large blocks of shares can either sell those shares piecemeal in the open market, or sell a large block of shares directly to the public, at a fixed price, through the secondary market. This type of offering is not dilutive, since no new shares are being created.

1.1. PROCESS OF IPO

When a company wants to raise money it plans on offering its stock to the public. This is typically takes place through either an IPO or an FPO (follow-on public offers). The book building process helps determine the value of the security. Once a company determines it wants to have an IPO, it will then contact a book runner or a lead manager. The book runner will determine the price range it is willing to sell the stock. The book runner will then send out the draft prospectus to potential investors. Generally, the issue stays open for five days. At the end of the five days, the book runner determines the demand of the stock for its given price range. Once the cost of the stock has been determined, then the issuing company can decide how to divide its stock at the determined price to its bidders.

When a new company is floated, its shares are issued to the public in primary market as an Initial Public Offer (IPO), New issues market does not have a physical structure or form. The Public issue involves sale of securities to members of the public. The issuing company makes an offer for sale to the pubic directly of a fixed number of shares at a specific price. The offer is provided with legal document known as Prospectus. Thus this a kind of invitation by a company to the public to subscribe to the securities offered through a prospectus. Public financial institutions will provide facility of underwriting for the public issues. This is one of the famous methods for floating securities in the new issue market, but it involves an elaborate process and consequently it is an expensive method.

In the book-building framework, the theory of partial adjustment suggests that investment banks only partially adjust IPO offer prices upward when they receive positive information about the value of the issue. They purposely leave money on the table to reward investors who truthfully reveal their information about the issue and threaten access to future deals for those that do not. Some studies suggest that investment banks underprice IPOs to protect their reputation. When new issues are priced lower than they should be, investment bankers reduce their legal liability by lowering the chance of price declines. There is also evidence that greater underpricing leads to more aftermarket trading volume, which increases the revenue of investment bankers when they subsequently become the market-makers for these IPO firms. Investment bankers also benefit from underpricing because it allows them to curry favor with their clients in exchange for their loyalty and continued business. These explanations do not make it clear why issuing firms approve underpricing as it only benefits the investment banks.

Studies have found that IPOs in the United States are underpriced an average of 15 percent. Thus, at the end of the first day of trading, the stock price of a company is typically 15 percent higher than the initial price set by the underwriter. Conventional wisdom has held that the gap is inevitable given the risks in taking public a young company that often has little or no track record. Research has found that IPOs are underpriced an average of 15 percent. A common explanation for this gap between the initial and close-of-the-first-day prices is that firms going public are risky ventures and investment banks are prudent to set initial prices low.

2. REVIEW OF LITERATURE

Anthony Saunders (1990) The study examines reasons for IPO underpricing and evaluate the degree to which underpricing is due to Glass-steagall restrictions, and to know the implications of those underpricing and of associated empirical evidence, for commercial & investment bank regulation. The results revels that new issue did appear to be less underpriced before Glass-steagall, evidence suggests that those investment banks that excessively underprice today lose future business form prospective issuing firms and investment bank's own IPOs are also underpriced on average. Rohini Inder Chopra (2009), The researcher intends to examine the price performance of the Indian IPOs listed on NSE, using a sample of IPOs that tapped the NSE market during 1999-2008 by taking in consideration of their price. The short run as well as long run analysis of their price performance have been done. The study reveals that underpricing is present in the Indian capital market, it also found that underpricing is more prevalent in the short run than in the long run. John D. Knopf (1999) Numerous empirical studies of the well documented IPO underpricing anomaly have employed a variety of different proxies for risk, none of which seem able to explain a significant portion of initial trading day returns. We find evidence that several of the risk proxies used in these studies are outperformed by the Parkinson Extreme Value method in

explaining returns to IPOs; hence, these studies seem to have underestimated the explanatory power of uncertainty to predict IPO returns. Nonetheless, we do find evidence in support of the asymmetric information theories of IPO underpricing. A.K.Mishra(2010) The study adds new evidence to the existing literature on IPOs in a significant manner. Firstly, in consistence with the 'hot issue market' theory it highlights that on the main broad of the Indian Exchange, IPO underpricing increased in 2007. The empirical findings indicate a significant mean positive underpricing (14.45%); nonetheless, 60% of IPOs in the sample are initially overpriced. Secondly, there is no evidence has found in difference in underpricing between fixed price and book built offers. Chiraz Labid et.al(2010) Many studies argue investors' sentiment significantly affects IPO pricing and performance. Accordingly, first day returns are expected to be driven by over-optimistic investors rather than stock fundamentals. In the IPO market Asset overvaluation and subsequently underperformance can be explained by investors' opinions divergence. In the study Excess early market return volatility is compared as the difference between the standard deviation of the first 25 daily returns after the issuance, excluding the intial return, and the return volatility of the corresponding MSCI market index for the same period. Md. Gazi salah Uddin, et.al (2009) The researcher seeks evidence supporting the existence of share market efficiency based on the monthly data and it investigates the reason of market inefficiency, relationship between share price and interest rate, and changes of share price and changes of interest rate were determined through both time series and panel regressions. The results reveals that if the interest rate is considerably controlled, then it is a great benefit to stock exchange through demand pull way of more investors in share market, and supply push way of more extensional investment of companies.

3. OBJECTIVES OF THE STUDY

- To measure the extent of risk of IPO s after market performance.
- To analyze the performance of listed companies with returns in different intervals.

HYPOTHESIS

- Relationship between Stock returns and Market Returns.
- Relationship between Stock risk and Market risk.

4. METHODOLOGY

The research can concentrates only on secondary data taking intervals of share price after IPO issues on listing day issue price and closing price of issue, first day, after 1 week, 1 month, 3 months, 6 months from 2010 to 2013 from listed IPOs of NS. The study investigates if IPO once got issued, how it is going to perform after the market, initially how it performs, later on how it is going to get fluctuate it stocks prices with market returns through this it analyze the extent of risk involved on it. The present study is to confine to t test. The first part of the research is survey to explain average returns of consolidated intervals by calculating both stock and market. Data is analyzed with SPSS software.

5. RESULTS AND ANALYSIS

The collected data analyzed to study the above cited objectives and the results drawn are as follows.

TABLE- 1: ONE-SAMPLE STATISTICS ON STOCK RETURNS

Selected Stocks	N	Mean	Std. Deviation	Std. Error Mean
Punjab & Sind bank	5	-25.4923	42.60556	19.05379
Jaypee Infratech limited	5	-12.9711	28.60150	12.79098
A2Z maintenance & engineering services ltd	5	-21.7638	19.11366	8.54789
Indo Thai securities limited	5	-61.5915	45.32128	20.26829
SRS limited	5	-30.2422	25.86380	11.56664
L&T finance holdings limited	5	-5.3649	5.62530	2.51571
Paramount Print packaging limited	5	-18.3122	16.11345	7.20615
Mt Educare limited	5	12.5999	13.53777	6.05428
National buildings construction corporation limited	5	-4.6972	22.51786	10.07029
V-mart retail limited	5	-11.0562	10.95773	4.90045

Table-1 exhibits the stock returns and risk of the ten selected companies with five different intervals namely Day one, first week, one month, three months and six month. Out of ten companies, MT Educare Ltd have high margin of returns (12.5999), National Buildings Constructions Corporation returns (-4.6972) than the remaining stocks and where as risk is very low with L&T Finance Holdings Limited has less risk (5.62530) compared to remaining companies.

TABLE-2: ONE-SAMPLE TEST ON STOCK RETURNS

	Test Value = 0					
Selected Stocks	T	df	(2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Punjab & Sind bank	-1.338	4	.252	-25.49234	-78.3941	27.4095
Jaypee Infratech limited	-1.014	4	.368	-12.97110	-48.4846	22.5424
A2Z maintenance & engineering services ltd	-2.546	4	.064	-21.76376	-45.4965	1.9690
Indo Thai securities limited	-3.039	4	.038	-61.59145	-117.8652	-5.3177
SRS limited	-2.615	4	.059	-30.24220	-62.3563	1.8719
L&T finance holdings limited	-2.133	4	.100	-5.36489	-12.3496	1.6198
Paramount Printpackaging limited	-2.541	4	.064	-18.31220	-38.3197	1.6953
MT Educare limited	2.081	4	.106	12.59988	-4.2095	29.4092
National buildings construction corporation limited	-.466	4	.665	-4.69723	-32.6569	23.2624
V-Mart Retail Limited	-2.256	4	.087	-11.05617	-24.6620	2.5497

Table – 2 evidence that there is no significance for the selected stock returns, Except the Indo Thai Securities (0.38) is significant at 5%.

TABLE- 3: ONE-SAMPLE STATISTICS ON MARKET RETURNS

Selected stocks	N	Mean	Std. Deviation	Std. Error Mean
Punjab & Sind bank	5	1.2347E5	2.63465E5	1.17825E5
A2z maintenance & engineering services ltd	5	1.2157E5	2.59422E5	1.16017E5
Jaypee Infratech limited	5	1.0724E5	2.27806E5	1.01878E5
Indo Thai securities limited	5	9.9490E4	2.09933E5	93885.11301
SRS limited	5	9.8850E4	2.10096E5	93957.59094
L&T finance holdings limited	5	1.1361E5	2.42888E5	1.08623E5
Paramount Printpackaging limited	5	1.1518E5	2.45870E5	1.09956E5
MT Educare limited	5	1.0778E5	2.29203E5	1.02503E5
National buildings construction corporation limited	5	1.1877E5	2.27620E5	1.01795E5
V-Mart Retail Limited	5	1.2365E5	2.63824E5	1.17986E5

Table-3 exhibits the market returns and risk of the ten selected companies with five different intervals namely Day one, first week, one month, three months and six month. Out of ten companies, INDO THAI SECURITIES have high margin of returns (9.9490E4), SRS LTD also have gained good returns (9.8850E4) than the remaining stocks when it turns to risk, it is going to be very moderate with all the companies.

TABLE-4: ONE-SAMPLE TEST ON MARKET RETURNS

	Test Value = 0					
Selected Stocks	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Punjab & Sind bank	1.048	4	.354	1.23474E5	-203661.2789	450609.4589
A2z maintenance & engineering services ltd	1.048	4	.354	1.21567E5	-200548.5120	443681.9520
Jaypee Infratech limited	1.053	4	.352	1.07238E5	-175620.6461	390096.9661
Indo Thai securities limited	1.060	4	.349	99490.46000	-161176.4025	360157.3225
SRS limited	1.052	4	.352	98849.91000	-162018.1835	359718.0035
L&T finance holdings limited	1.046	4	.355	1.13609E5	-187976.9236	415194.0836
Paramount Printpackaging limited	1.048	4	.354	1.15185E5	-190102.9382	420472.5182
MT Educare limited	1.051	4	.352	1.07775E5	-176817.3351	392367.9951
National buildings construction corporation limited	1.167	4	.308	1.18773E5	-163854.4089	401400.2689
V-Mart Retail Limited	1.048	4	.354	1.23648E5	-203932.5542	451228.4142

Table 4 reveals the results of t-test that there is no significance for any selected market returns.

5.1. PRICE PERFORMANCE OF IPOS AFTER MARKET PERFORMANCE

Short run analysis of Price Performance of the IPOs is essential to study the extent of risk after IPO issue. For this purpose, the buy and hold period of the first trading day i.e. 1st listing day, 1st Week, 1st Month, 3rd Month, 6th Month after listing day has been considered.

TABLE: 5: RETURNS OVER SHORT RUN

TIME FRAME	N	R_Returns	MR_Returns	SD
ON THE LISTING DAY	5	5.694	540557	382227.4941
ON THE 1st WEEK	5	-26.806	5419.22	3850.921915
ON THE 1st MONTH	5	-22.927	5272.6	3744.503052
ON THE 3rd MONTH	5	-22.648	10132.23	7180.583096
ON THE 6th MONTH	5	-21.968	5423.35	3850.421284

The overall return obtained from the IPOs is shown in the table. The returns, thus it calculated Raw Return taken on listing day, one week, one month, three months, and 6 months. So as to analyze the price performance of IPO, in the short run, these returns are in turn compared with that of Market return, which are calculated by taking into consideration the CNX Nifty index.

TABLE 6: MAX AND MIN OF R_RETURN AND MR_RETURN

TIME FRAME	N	MAX R_Return	MAX MR_Return	MIN R_Returns	MIN MR_Return
ON THE LISTING DAY	5	34.65	595590	-27.35	47689
ON THE 1st WEEK	5	12.93	6201.5	-100	4745.6
ON THE 1st MONTH	5	12.93	59911.7	-84.79	4828.9
ON THE 3rd MONTH	5	17.31	53780	-82.7	4551.6
ON THE 6th MONTH	5	31.74	5807.4	-85.47	5121

These returns showed the extent of underpricing of the IPOs which generate returns to the investors on the first trading of price discovery. The returns fall down dramatically after one week from the listing day and it get fluctuated by raising again after 6 months with max returns (31.74) but the market return get continuously falling from the listing day up to 6 months gradually (5807.4).

6. POLICY IMPLICATIONS

As the short run analysis clearly shows the performance of the IPOs after market, all the selected Ipos during the study period got underpriced and it is found that risk is comparatively very high with stock to market returns. So investors should aware of the concept of "Green Show Option ", it allows companies to intervene in the market to stabilize share prices during the 30 day stabilization period immediately after listing. So the investor should go through the offer document of the company to know more about it. The green shoe option is exercised by a company making a public issue. The issuer company uses green shoe option during IPO to ensure that the shares prices on the stock exchanges does not fall below the issue price after issue of shares.

7. CONCLUSIONS

From the foregoing analysis, it can be found that the short run analysis of price performance reveals that IPO after market, i.e. from the listing day to the six months after listing, the selected companies under NSE, has huge fluctuations where, the difference between the extent of risk is very less with L&T Finance Holdings LTD and Punjab & Sind Bank has given high risk compared with returns it is MT Educare LTD (12.59). There is no significance for the selected stock returns during the study except Indo Thai Securities has (0.38) are significant at 5%. While market returns the Indo Thai securities has high margin of returns (9.9490E4), SRS Ltd also have gained good returns (9,8850E4) and There is no significance for market returns during the study. The study reveals that the IPOs aftermarket performs huge fluctuations and stock returns get underpriced by the time IPOs got listed and after 6months there may be various factors which affect IPO underpricing.

REFERENCES

1. A.K. Mishra (2010) " Underpricing of Indian Public Offerings in India: A Comparison of the Book-Building and Fixed –Price Offerings, IMJ, vol.2, Issue 2, PP. 37-41.
2. Aunthony Saunders (1990) "Why are so many new stock issues underpriced" Federal Reserve Bank of Philadelphia, PP.3-6.
3. Chiraz Lobidi and Touraya Triki (2010) " Determinants of IPO Pricing and Long-Term Performance in the MENA Region, Politics and Economic Research Forum, PP. 1-10.
4. John D. Knopf and John L. Teall "The IPO Effect and Measurement of Risk" Journal of Financial and Strategic Decisions, Volume 12 Number 2 Fall 1999, PP.52-55.
5. Md. Mahmudul Alam, Md.Gazi Salah Uddin (2009) "Relationship between Interest rate and stock price: Empirical Evidence from Developed and Developing Countries", International Journal of Business and Management, Volume No-4, Issue No.3 PP.43.
6. Rohini Inder Chopra (2009)," Price performance of IPO in Indian Capital market" A Thesis of M.Phil. PP. 45-52.

WEBSITES

7. www.capitalmarket.com
8. www.chittorgarh.com
9. www.economicstimes.com
10. www.moneycontrol.com
11. www.nseindia.com
12. www.sebi.gov.in

OVERVIEW OF ANDROID OS AND ITS SECURITY FEATURES

M. SATISH KUMAR
ASSOCIATE PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

J. THANUJA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

G. DIVYA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Android powers countless cell phones in more than 190 nations around the globe. It's the biggest introduced base of any portable stage and developing quick consistently another million clients power up their Android gadgets shockingly and begin searching for applications, amusements, and other computerized substance. Android issues you a world-class stage for making applications and diversions for Android clients all over, and also an open commercial center for dispersing to them in a flash.

KEYWORDS
Catchphrases – DVM, Linux. Android Developer Challenger (ADC).

1. INTRODUCTION

Android gives a rich application system that permits you to construct imaginative applications and diversions for cell phones in a Java dialect environment. The records recorded in the left route give insights about how to assemble applications utilizing Android's different APIs. Android applications are fabricated as a mix of particular parts that can be conjured exclusively.

2. ANDROID OS ARCHITECTURE OF A PROCESS

The structural planning of the android is a hill of delicate ware's. It is to add to the android applications, it contains center arrangement of use for ever day undertakings, for example, offer web skimming and email are incorporated in android handset. The android is an open source advancement environment for remote. Presently a day's android is a rising versatile advancement stage.

2.1 LINUX KERNEL

The handset runs a Linux OS it secures the android applications, every android application runs in its own particular virtual machine, the android applications are overseen code ,and the Linux Kernel is keeps up different android applications at once.

2.1.1 SECURITY & CONVENTION

It is kept up by verity of security majors, it secure the information yet not subject to malwares. At the point when application is introduced the OS makes new client profile connected with the applications. Every application runs as diverse clients with its own private record on the document framework.

2.1.2. CONTENT PROVIDERS

Google has stand out of the android, it creating android applications with cutting edge highlights. Android Developer Challenger (ADC) got 1788 applications at the first run through, later it extends the second ADC got 26000 applications, from that at last they chose 200 applications .

2.2 ANDROID LIBRARIES LAYER

On the highest point of the Linux Kernel layer is Android's local libraries. This layer empowers the gadget to handle distinctive sorts of information. Information will be particular to equipment. Every one of these libraries are composed in C or C++ dialect. These libraries are called through java interface. Some critical local libraries are:

Surface Manager: it is used to oversee presentation of gadget. Surface Manager utilized for forming windows on the screen.

SQLITEDATABASE

SQLite is the database used in android for data storage. It is relational database and available to all applications.

WEB KIT: SQLiteDatabase is the program motor which is utilized to show HTML content.

MEDIA SYSTEM: Media structure gives recording and playbacks of different sound, feature and picture groups.(for instance MP3, AAC, AMR, JPG, MPEG4, H.264, and PNG).

FREE TYPE: Bitmap and Font Rendering OpenGL

ES: Used to render 2D or 3D representation substance to the screen

LIBC : It contains System related C libraries**.**

ANDROID RUNTIME

- Each Android application runs in a different procedure, with its own particular occasion of the Dalvik virtual machine (VM). In view of the Java VM, the Dalvik outline has been upgraded for cell phones.
- The Dalvik VM has a little memory foot shaped impression, and numerous occurrences of the Dalvik VM can run simultaneously on the hand.

APPLICATION LAYER

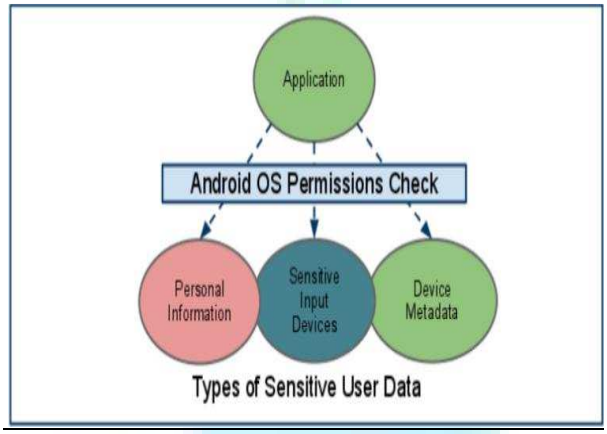
The Applications Layer will be the top layer in the Android construction modeling. A few applications come preinstalled with each gadget, for example, SMS customer application, Dialer, Web program and Contact director. A designer can compose his own particular application and can supplant it with the current application.

3. DIFFERENT SECURITY FEATURES OF ANDROID OS

Android Operating framework ought to guarantee the security of clients, client's information, applications, the gadget, and the system. To accomplish the security of these segments Android gives these key security highlights :

1. Security at the Operating System level through the Linux part.
2. Application sandbox for all applications
3. Secure bury process correspondence.
4. Application marking.
5. Application-characterized and client conceded consents.

FIG. 1



SECURITY ARCHITECTURE

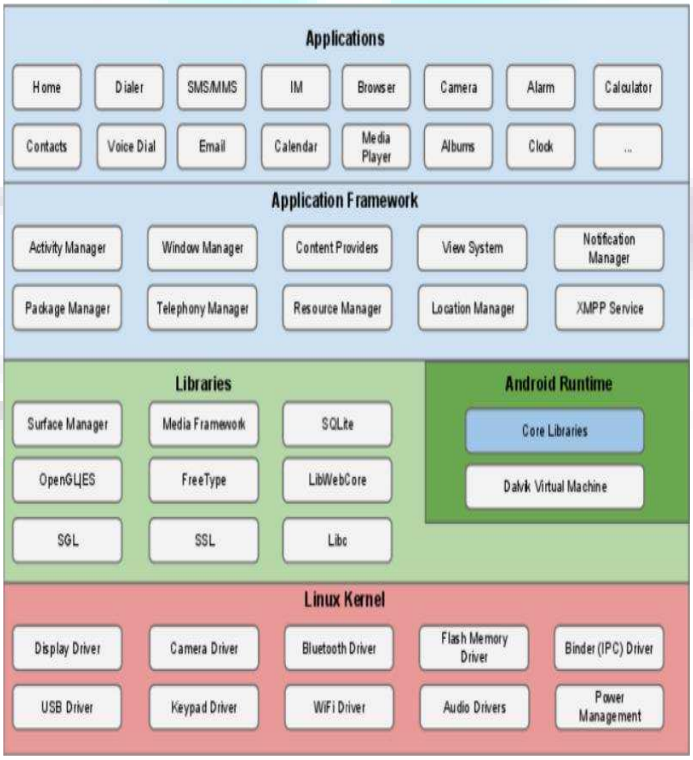
The Android working framework's objective is to ensure client information, secure framework assets, and give application disconnection. To attain to these objectives the accompanying security highlights are given [Security Overview]:

i. Robust security at the OS level through the Linux bit
ii. Mandatory application sandbox for all applications
iii. Secure bury process correspondence
iv. Application marking
v. Application characterized and client allowed authorizations

Figure 1 demonstrates the distinctive segments and contemplations of the Android programming stack. Every piece of the stack works under the supposition that everything beneath it is appropriately secured.

The center of the Android security model is the Linux piece. Linux itself has been around for quite a while and is an exceptionally powerful piece now in the wake of being continually made strides. It is utilized as a part of the business and trusted by numerous experts. This portion gives the Android OS a client based authorizations model, process disengagement, a system for secure IPC, and the capacity to evacuate parts of the part.

FIGURE 2: ANDROID SOFTWARE STACK



LINUX KERNEL

Android working framework is taking into account Linux bit. Because of its open source nature it will be investigated, assaulted and altered by numerous exploration engineers. So Linux has ended up steady and secure piece. Linux part gives Android a few key security highlights including

A) A USER-BASED PERMISSIONS MODEL

In the Linux document framework every record and registries has three client based authorizations. proprietor, bunch, different clients. proprietor - The Owner consents apply just the proprietor of the record or registry. bunch - The gathering consents apply just to the gathering that has been relegated to the document or registry. different clients - alternate Users consents apply to every single other client on the framework. Every record or index has three fundamental authorization sorts: read - The read consent means client's capacity to peruse the substance of the document. compose - compose authorizations mean's client's capacity to compose or alter a record or registry. execute - The execute authorization means client's capacity to execute a record or view the substance of an index [11]. This consent model guarantees that fitting security is kept up while getting to android documents.

B) PROCESS ISOLATION

The Android working framework allocates an extraordinary client ID (UID) to every Android application and runs it as a different methodology.

C) EXTENSIBLE MECHANISM FOR SECURE IPC

D) THE ABILITY TO REMOVE UNNECESSARY AND INSECURE PARTS OF THE KERNEL

THE APPLICATION SANDBOX

A sandbox is a security system for differentiating running projects and constraining the assets of the gadget to application. It is frequently used to execute untested code or projects from untrusted clients and untrusted sites. By utilizing sandboxing system restricted access to gadget's assets is given. Accordingly security of the framework is expanded. Sandboxing innovation is as often as possible used to test unconfirmed projects which may contain an infection or other malware code, without permitting the product or code to mischief the host gadget. With the assistance of sandbox untrusted project get to just those assets of the gadget for which consent is allowed. Consent is denied on the off chance that it tries to get to different assets of the gadget.

SECURE INTER-PROCESS COMMUNICATION

A portion of the applications still utilize customary Linux procedures, for example, system attachments, record framework and imparted documents for between procedure correspondence. Anyway android working framework additionally gives new system to IPC, for example, Binder, Services, Intents and Content Providers. All these system permits engineers to check the character of utilization furthermore used to set the security arrangements.

APPLICATION SIGNING

Keeping in mind the end goal to introduce and run applications on Android OS they must be digitally marked. With this system Android OS recognizing the creator of an application. This highlight additionally utilized to creating trust relationship between applications. In the event that an application is no marked legitimately then it can't be introduced on the emulator moreover. Some standard apparatuses, for example, Key device and Jar underwriter are utilized to produce keys and sign application .apk records.

APPLICATION-DEFINED AND USER-GRANTED PERMISSIONS

Authorizations are an Android security instrument to permit or limit application access. Of course, Android applications have no authorizations in all actuality, making them safe by not permitting them to get entrance to ensured APIs. A percentage of the secured APIs include: Camera capacities, Location information (GPS), Bluetooth capacities, Telephony capacities, SMS/MMS capacities and Network or information associations. These assets are gotten to just through the working framework.

SUMMARY

Android is an exceptionally common versatile working framework and will presumably be around for a long time to come. As cell phones get to be more best in class, they keep on having more uses and in this manner more data put away on them. It is imperative for shoppers and designers to comprehend the security dangers encompassing the stage and what they can do to secure their data. Clients need to be mindful of what applications they are introducing and engineers need to take the correct countermeasures to keep any security breaks or issues.

4. CONCLUSION

From above Content it will be clear that Android OS takes after an assortment of security instruments. At the point when a designer introduce an application another client profile with that application is made. Every application run with its own particular occurrence of DVM. So applications can't get to one another's information. On the off chance that applications need to get to imparted information or assets then they oblige consents. All Android applications are marked so clients realize that the application is bona fide. The marking instrument permits engineer to control which applications can concede access to other application on the framework.

REFERENCES

1. Frank Ableson and Charlie Collins and Robi Sen, Unlocking Android Developer's Guide by Manning Publication Co.
2. Wei-Meng Lee, Beginning Android Application Development By Worn Publication

A STUDY ON CUSTOMER PERCEPTIONS OF SERVICE QUALITY IN BANKS BASED ON THE SERVQUAL MODEL

AMEENA BABU V
ASST. PROFESSOR
FACULTY OF MANAGEMENT STUDIES
SREE NARAYANA GURU INSTITUTE OF SCIENCE & TECHNOLOGY
N.PARAVUR

DR. AMUDHA R
ASSOCIATE PROFESSOR
KARUNYA SCHOOL OF BUSINESS, LEADERSHIP & MANAGEMENT
KARUNYA UNIVERSITY
COIMBATORE

ABSTRACT

Customer Perceptions assumes great importance in the banking industry. According to the master circular of RBI on Customer Service, the quality and content of dispersion of customer service has come under tremendous pressure mainly owing to the failure to handle the soaring demands and expectations of the customers. Irrespective of the manner in which services are delivered, the way by which customers perceive the same differs. This research paper is an analytical study based mainly on the primary data collected through a scientifically developed questionnaire. The questionnaires have been personally administered on a sample size of 120, chosen on a convenient basis. The study is based on the SERVQUAL Model (Parasuraman, Zeithaml & Berry, 1998) which is used as a scale to measure service quality. The model takes into consideration five important dimensions collectively termed RATER which comprises of Reliability, Assurance, Tangibility, Empathy and Responsiveness attributes to measure service delivery. The study focuses on understanding the quality of service delivery in nationalized banks with respect to the above dimensions. Many researchers had proposed several variations for the studies using SEVQUAL. A conceptual framework has been formulated on account of the nature of gaps and based on the literature review as well. Whatsoever, it has been evident that the model fits the data better than any extended models. The present study further discusses the findings based on descriptive statistics and the implications are laid down.

KEYWORDS

Customer Perception, Customer Service, SERVQUAL, Reliability, Assurance, Tangibility, Empathy, Responsiveness.

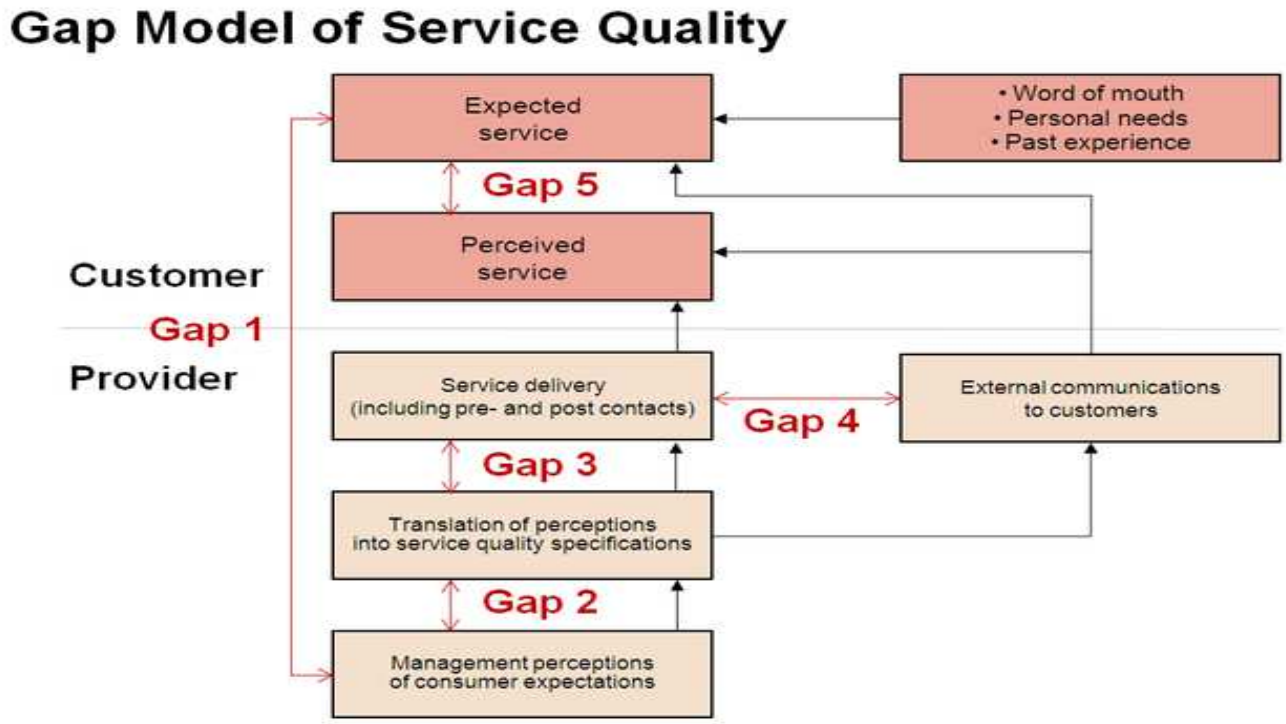
INTRODUCTION

Banking industry has undergone tremendous transformations post liberalization. According to the master circular of RBI on Customer Service, the quality and content of dispersion of customer service has come under tremendous pressure mainly owing to the failure to handle the soaring demands and expectations of the customers. Today banks can survive only by providing such customized and tailor-made offerings to the customers. In other words, long term growth and profit rests on the banks ability to attract and retain customer loyalty. Irrespective of the kind of services banks provide, it is now evident that the customer perceptions of such quality in effect determines the satisfaction level of customers. In this context, banks are striving hard to perform, from boosting workforce productivity to outsourcing operations to uncompromised customer service. This study focuses on the perceptions of customers towards the service quality exhibited by the nationalized banks. An attempt has also been done in order to understand the impact of service quality towards achieving customer satisfaction.

SERVICE QUALITY

Personal or Retail banking refers to banking in which banking institutions execute transactions directly with consumers, rather than corporations or other banks. Services offered include: savings and transactional accounts, mortgages, personal loans, debit cards, credit cards, and so forth. Since this kind of banking is aimed for customers who need services that are customized and tailored as per their specific needs, the needs and expectations of customers should be studied very well by marketers and service providers who come face to face in contact with the customers. Definitions of service quality hold that this is the result of the comparison that customers make between their expectations about a service and their perception of the way the service has been performed (Lehtinen & Lehtinen, 1982; Lewis & Booms, 1983, Gronroos, 1984; Parasuraman et al., 1985; 1988; Caruana, 2002). Service quality is defined as the degree of discrepancy between customers' normative expectation for service and their perceptions of service performance (Parasuraman et al., 1985). It is essential to have an understanding of the customers' expectations of service quality and their perceptions in order to understand the gap between the two so that such efforts can lead to developing and offering excellent service quality in banking. This gap between the expected service and the perceived service is known as the Gap Model of Service Quality (Ziethaml & Bitner 1996). This is also known as the Customer Gap. Closing the gap between what customers expect and what they perceive is critical to delivering quality service; it forms the basis for the gap model.

FIG. 1: GAP MODEL OF SERVICE QUALITY



Source: Zeithaml, Bitner et al 2006

The customer gap is the difference between customer expectations and perceptions. Customer expectations are standards or reference points that customers bring into the service experience, whereas customer perceptions are subjective assessments of actual service experiences. Customer expectation often consists of what a customer believes should or will happen. For example, when you visit an expensive restaurant, you expect a high level of service, one that is considerably superior to the level you would expect in fast-food restaurant. Thus it is very crucial to close these gaps in any services sector especially banking because it is a highly sensitive area and people would need a basic trust and transparency in such dealings with the service providers.

The sources of customer expectations are market controlled factors (such as pricing, advertising, sales promises) as well as the marketer has limited ability to affect (innate personal needs, word-of-mouth communications, and competitive offerings). In a perfect world, expectations and perceptions would be identical: Customers would perceive that they have received what they thought they would and should.

LITERATURE REVIEW

Many researchers have undergone vast studies in the area of service quality and customer perception. It is quite evident that customer perceptions of service quality differ for different banks. There are many factors which contribute to the service quality perceptions of customers in Indian banking. Some of the factors are reliability, assurance, tangibility, empathy, responsiveness as mentioned in the dimensions of Service Quality formulated by Zeithaml, Bitner et al 2006. Many studies also show various other factors that determine service quality but SERVQUAL has found to be a common standard instrument that has been used in most of the research works. Rather than just determining the factors accruing to service quality, this study shows the customer perceptions on service quality in nationalized banks and whether it leads to customer satisfaction in the Indian context with reference to Ernakulum district in Kerala state. Some of the previous studies and literature involving customer perceptions and service quality are detailed below.

SERVICE QUALITY & CUSTOMER PERCEPTIONS

According to the research paper, "Customer perceptions on service quality in retail banking in Middle East: The case of Qatar", the authors Mohammed Hussain and Sherly Leo has evaluated service quality on different levels of perception. The study indicated that good manners and hospitality and the eagerness to resolve customer grievances are very important for good service quality. The study also finds that imposing fines and service charges make the customers unsatisfactory. The study suffers from the limitation that the results cannot be generalized for the Indian context and that only a limited number of banks have been selected to carry out the study.

In a study that came in the Journal of Asia Pacific Marketing by Charles C Cui, Barbara R Lewis and Xiaofang Dong titled "Employee and Customer perceptions of Service Quality: Match or Mismatch? A Study of Chinese Retail Banking", the key determinants of service quality was found to be access, availability, communication, competence, convenience, courtesy, flexibility. Another important finding of the research study was that there was a mismatch between consumer expectations and employee expectations of consumer expectations. The study suffered from the limitation that because of its exploratory nature, most of the results obtained were not based on a statistical measure.

In the paper titled "Perceptions of banking services in the wake of bank mergers: an empirical study", David J U and Michael D Pratt presents the results of a telephone survey of consumers concerning the relationship between bank mergers and service quality perceptions. The survey results provide evidence of a significant relationship between bank mergers and service quality perceptions based on the demographic characteristics such as gender, ethnicity, education and income of the respondents.

Ravichandran K, Tamilmani B, Arunkumar S,Prabhakaran S in their research paper, Influence of Service Quality on Customer Satisfaction-Application of Servqual Model, International Journal of Business and Management, conducted a descriptive research to gain an insight into consumer's perceived service quality offered by private banks with respect to five dimensions of SERVQUAL scale. The study affirms that the service quality level on private banks was at adequate level and the regression on overall service quality lists out the various SERVQUAL items which has a spread in all the dimensions of the SERVQUAL model.

In the International Journal of Bank Marketing, Angur, Madhukar G, Nataraajan, Rajan , Jahera, John S, Jr made a study on the Service quality in the banking industry: an assessment in a developing economy wherein the results reinforce their proposal that the five dimensions of service quality are of varying importance, with reliability and responsiveness dimensions being the most important.

To ascertain any actual or perceived gaps between customer expectations and perceptions of the service offered, a desciptive study was conducted banks in Navi Mumbai by Rajesh Nair, Ranjith P V, Sumana Bose and C Charu in the SIES Journal of Management. The results showed that gender and occupation do not

have any impact on both Expectations and Perceptions of the valued customers on most important parameters considered, i.e., Safety of transactions, Willingness to help and Interest in solving consumer problems in bank in Navi Mumbai.

In a study on Essence of Banking Services Marketing : Measuring customer satisfaction- in the Indian Management Studies Journal by B B Singla and Amar Inder Singh, main emphasis has been given on the various factors that lead to bank customer's satisfaction like efficient and courteous customer service, attractive and innovative schemes, developing subsidiary services and aggressive personalized selling strategies. But all these studies are based on the fact that a gap between expectation and perception of banking services do exist. The research conducted here, in effect adds up to the existing literature by giving more substantial evidences that a gap called customer gap do exist as proposed by its founders.

NEED OF THE STUDY

Post liberalisation, banks have contributed significantly to the growth of services sector in the economy. Banks are competing intensely in a highly competitive environment to offer quality oriented services according to customers' expectations. Researchers are studying various key segments of banking sector like operations, service quality, employee satisfaction, customer satisfaction, financing products, efficiency, financial performance to better understand and serve the community at large (Ananthasamy). Banking system in India has continually proved to be the backbone of the economy since 1980s. In this scenario, it has become very important for the banks to retain their existing customer as well as to enlarge it. As the numbers of banks are increasing; customers' expectations of service quality is growing. It has become imperative to measure the service quality of the bank so that the service providers assess their level of service quality and identify the quality gaps for improvements. Service Quality is seen to be one of the main determinants of customer satisfaction (Appannan et al, 2013).

Today, the customers themselves have easy access to information and they are in continuous search for information related to banking and its service aspects. Sometimes banks even become forced to reveal certain processing information and working profile to its customers and make banking more transparent. This is because of the customers' accessibility to information especially through social networking sites and reference groups. Banks need to be cautious about every service encounter with the customer because a customer lost is lost forever. This realisation has made banks to enhance and set the quality of service and service experience to a higher limit. Only satisfied customers will stay and dissatisfied customers will not only switch to other banks but also communicate badly to other customers and this will have a negative impact on future prospects.

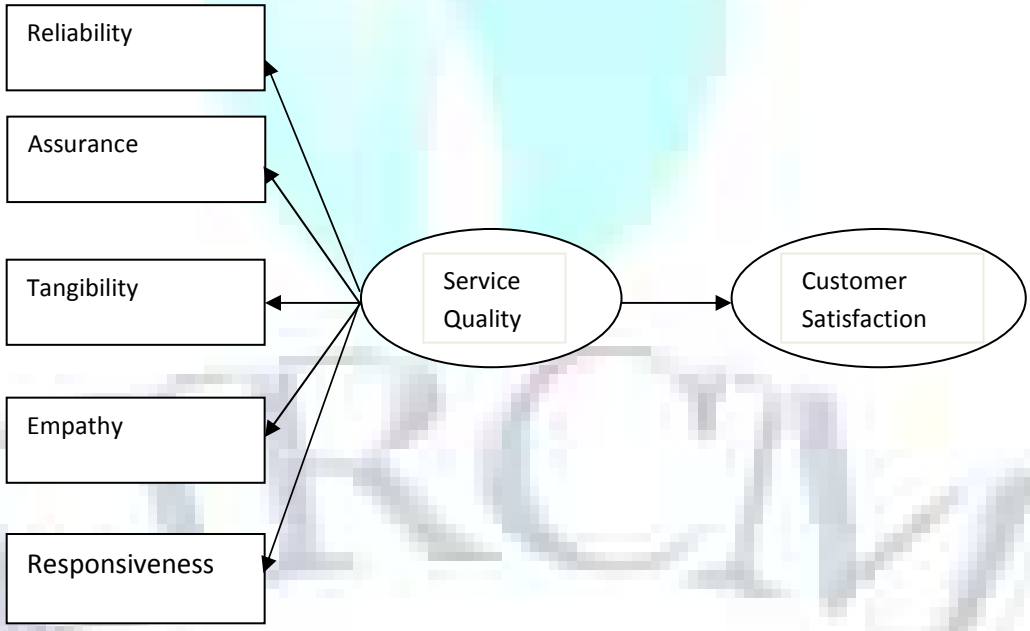
It is necessary for banks to know what are the behavioural intentions of customers, their perceptions and underlying factors, if not it becomes difficult for practising managers to design and formulate strategies to control and improve customer loyalty. This awareness alone will help the banking industry to withstand and survive in this ever changing and dynamic as well as competitive environment. Today, competition exists not just within banks belonging to the same sector, i.e., between public and private banks but also exists intra banks or between public banks or private banks. Thus in order to gain a competitive edge, banks must perform with high standards, know their customer better and deliver better service quality as against others.

STATEMENT OF THE PROBLEM

The banking industry has undergone tremendous changes in the recent years. With increased customer demands, changing consumer behaviour, technological rise, changes in economic and psychographic profiles of customers, all have contributed to the difference in nature and scope of the banking environment. Banks are thus forced to concentrate on their service quality aspects which will determine the nature of customer satisfaction of its customers. If the customers are satisfied, it will enhance the customer loyalty and hence banks will be able to retain its customers. On the other hand, if customers are dissatisfied due to bad service quality, then customers will not turn out to be loyal and they shall not recommend the bank's products to their peer groups and will switch over to other banks.

CONCEPTUAL FRAMEWORK FOR THE STUDY

FIG. 2: GAP MODEL OF SERVICE QUALITY



OBJECTIVES OF THE STUDY

Based on the previous literature reviewed for the study, Service Quality is found to be a strong predictor of customer satisfaction. The SERVQUAL measuring instrument developed by Parsuraman et al. (1988) was adapted and used for the present study in order to find out the extent to which the various dimensions provide satisfaction to customers. A hypothesis has also been developed for the study to study relationship between Service quality and Customer satisfaction.

THE STUDY AIMS TO FIND OUT THE FOLLOWING

1. To study customer perceptions in terms of tangibles, reliability, responsiveness, empathy and assurance dimensions of service quality among nationalized banks.
2. To study the relationship between service quality and customer satisfaction.
3. To offer suggestions, if needed, based on the analytical results of the current study.

HYPOTHESIS

H_0 – There is no relationship between Service Quality and Customer Satisfaction
H_1 – There is significant relationship between Service Quality and Customer satisfaction

RESEARCH METHODOLOGY

The research paper titled "A STUDY ON CUSTOMER PERCEPTIONS OF SERVICE QUALITY IN BANKS BASED ON THE SERVQUAL MODEL" is an analytical research carried out basically to find out the Customer perceptions of Service quality. The study makes use of a standard questionnaire called the SERVQUAL instrument for data collection from 120 respondents based on convenience sampling. The respondents were mostly youngsters who belong to the age group of 25-30. It is also found that all of them maintain an account with nationalized bank basically because it happens to be their salary account. The questionnaire comprises of a total of 22 statements which helped to measure the service quality dimensions and customer satisfaction.

The parameters identified for the study are

1. Reliability
2. Assurance
3. Tangibility
4. Empathy
5. Responsiveness.

Each respondent were asked to rate each item on a 1-to-5 response scale ranging from strongly disagree (1) to strongly agree (5).The data was analyzed using SPSS Software.

MEASUREMENT OF THE CONSTRUCTS

Five service quality determinants have been chosen from the study propounded by Parasuraman et al., 1988. These elements are also accepted by other authors as per the literature review to conclude the service quality in banking sector. In the present study service quality was measured by five variables which were tangibility (four items), reliability having five items, responsiveness was measured with four items, assurance measured with four items and there were five items of empathy. Satisfaction and loyalty have one item each, used in this study. The element used to calculate the reaction was 5-Point Likert scale where 5 was the upper-most level of unity and 1 was the lower-most one. The SPSS technique was used for data analysis and findings.

DATA ANALYSIS & INTERPRETATION

(I) DEMOGRAPHIC PROFILE OF CUSTOMERS

Among the 120 respondents that were surveyed, there were 62 males and 58 female respondents. The table, Figure 1 below illustrates this and Figure 2 depicts the income level of the respondents. It is evident from the table that 42% of respondents draw an income that is between 15000 – 20000. Almost 25% each draws between 10000-15000 and between 20000-25000 respectively.

TABLE 1: GENDER OF RESPONDENTS

Subject		Frequency	Percent
Valid	Male	62	51.7
	Female	58	48.3
	Total	120	100.0

TABLE 2: INCOME OF RESPONDENTS

Items		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Between 10000-15000	29	24.2	24.2	24.2
	Between 15000-20000	51	42.5	42.5	66.7
	Between 20000-25000	30	25	25	91.7
	More than 25000	10	8.3	8.3	100
	Total	120	100	100	

(II) ANALYSIS OF SERVQUAL DATA

The Figure 3 below shows the descriptive statistics of SERVQUAL data. The mean of the five dimensions to SERVQUAL are shown in the table. The descriptive statistic shows the direction of response. In the table below, the mean value that is 3.997 of tangibility reveals respondents agree that tangibility enhance the service quality of banking as well as reliability and assurance the mean value depicts the response rate of potential respondents is in positive side. For responsiveness and empathy, the mean values are lesser.

TABLE 3: DESCRIPTIVE STATISTICS OF SERVQUAL DATA

		Tangibility	Reliability	Assurance	Responsiveness	Empathy
N	Valid	120	120	120	120	120
	Missing	0	0	0	0	0
Mean		3.9979	3.9800	3.5813	2.3333	2.1750
Median		4.0000	4.0000	3.5000	1.7500	2.2000
Std. Deviation		.27405	.30059	.30258	1.04837	.27263
Items		4	5	4	4	5

TABLE 4: FREQUENCY DISTRIBUTION (RATER)

Items	Reliability	%	Assurance	%	Tangibility	%	Empathy	%	Responsiveness	%
Strongly agree	4	3	0	0	9	7.5	0	0	6	5
Agree	108	**90**	88	**73**	110	**92**	0	0	22	18
Neutral	8	7	32	27	1	1	13	11	8	7
Strongly disagree	0	0	0	0	0	0	106	**88**	78	**65**
Disagree	0	0	0	0	0	0	1	1	6	5

The Figure 4 above shows that 90% of respondents are satisfied as far as the reliability factor of public sector banks is concerned. They believe that banks keep promises, show interest in solving problems, provide error free service the very first time and give service at the said time. The figure further shows that 73% of youngsters agree that employee behavior within the banks instills confidence; employees extend courteousness with customers, and have the knowledge to answer the customer's queries. In other words, assurance prevails in the banks. Again, a whopping 92% of youngsters who are customers in public sector banks have agreed that tangibility prevails in banks. That is to say that bank has modern looking equipments, visually appealing physical facilities, the employees are neat in appearance and that very attractive promotional materials are used by the public sector banks.

On the other hand, Empathy and Responsiveness factors affecting Service Quality shows negative responses from the part of the respondents. The respondents say that they do not get Individual attention from bank employees, the operating hours are not convenient, customers do not get personalized service, employees do not take customers best interest at heart and they fail to understand specific needs of customers.

(III) OVERALL SATISFACTION WITH THE BANKS

TABLE 5: OVERALL SATISFACTION WITH THE BANKS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	85	70.8	70.8	70.8
	No	35	29.2	29.2	100.0
	Total	120	100.0	100.0	

The majority of the customers agree that that they are satisfied with the overall service quality of the banks. 71% that is 85 out of 120 respondents are satisfied with the banks in public sector whereas 29 % are not satisfied with nationalized bank's performance.

(IV) SERVICE QUALITY AND CUSTOMER SATISFACTION

The second part of the study attempts to find out the relationship between Service Quality and Customer Satisfaction. This is also shown in the conceptual framework for the study. While the null hypothesis (H_0) states that "there is no relationship between Service Quality and Customer Satisfaction", the alternate hypothesis (H_1) states that 'there is significant relationship between Service Quality and Customer Satisfaction". In order to test this hypothesis and to know whether there is any significant relationship between the two variables, chi-square tests was conducted. The following are the results of the chi-square test:

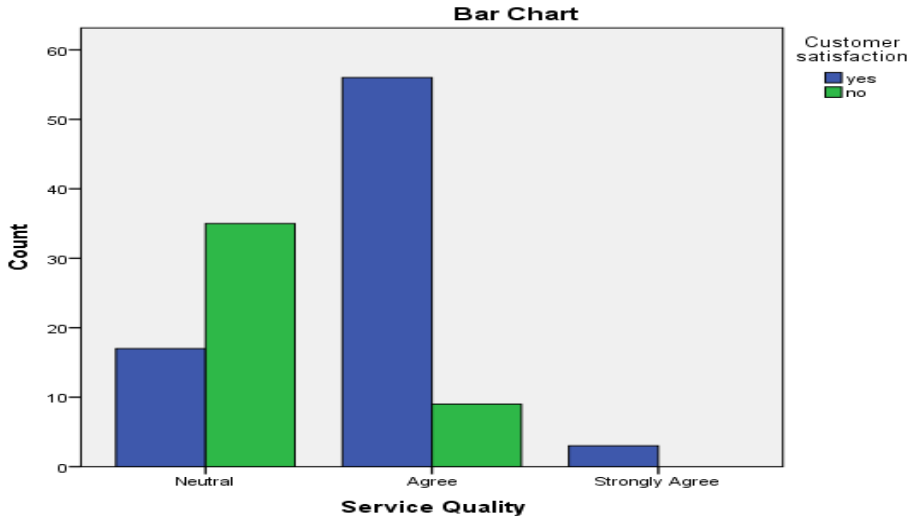
TABLE 6: SERVICE QUALITY * CUSTOMER SATISFACTION CROSS TABULATION

		Customer satisfaction		Total
		yes	No	
Service Quality	Neutral	17	35	52
	Agree	56	9	65
	Strongly Agree	3	0	3
Total		76	44	120

TABLE 7: CHI-SQUARE TESTS

		Customer satisfaction		Total
		yes	No	
Service Quality	Neutral	17	35	52
	Agree	56	9	65
	Strongly Agree	3	0	3
Total		76	44	120

FIG.3: BAR CHART SHOWING SERVQUAL-CUSTOMER SATISFACTION RELATIONSHIP



The chi-square tests in Figure 7 illustrates that the significance value is less than 0.05. This indicates that the null hypothesis is rejected and H_1 is accepted. Therefore, it is proved that there is significant relationship between Service Quality and Customer Satisfaction.

RESULTS & DISCUSSION

The research paper titled "A Study on Customer perceptions of Service quality in banks based on the SERVQUAL model" is an attempt to analyze the perceptions of customers on service quality. The sample size adopted for the study was 120 and the respondents were youngsters who were customers of nationalized banks in N.Paravur taluk of Ernakulum district. The study also brings into light the relationship between Service Quality and Customer satisfaction.

The demographic profile of the respondents showed that 62 male and 58 female customers were surveyed with the help of a standard instrument –SERVQUAL. Also most of them drew a salary between 15000-20000.

Customers opinion on the five dimensions of Service quality was collected and analyzed and it was found that they agree that reliability, assurance and tangibility factors exists in the nationalized banks but they are low on empathy and responsiveness factors. 90% of customers agreed that there is tangibility, 73% agree that assurance is there and 92% agree that tangibility is there. Thus Customer perceptions of Service quality were recorded. Further, the relationship between Service quality and Customer satisfaction was statistically tested and found significant.

LIMITATIONS OF THE STUDY

1. Data has been collected for the study from youngsters. Hence this will not express the opinions of a larger community comprising of adults and senior citizens.

2. The study, though taking into account SERVQUAL as the instrument to measure customer perceptions, it does not fully utilize the instrument by measuring the Expectation-Perception Gap score. Instead the study assumes the expectation values to be typically high.
3. The overall satisfaction of banks has been projected as a nominal scale. Other statements probably contributing to customer satisfaction were not included in the questionnaire.

SCOPE OF THE STUDY

The research paper titled "A Study on Customer perceptions of Service quality in banks based on the SERVQUAL model" is a cross-sectional study among the youth who are customers of different national banks in N Paravur taluk of Ernakulam district in Kerala. The findings of the study based on the five dimensions of Service Quality and the significant relationship of Service Quality and Customer satisfaction definitely form a basis for future research in the purview of SERVQUAL (Parasuraman et al, 1988) by associating it to several other independent variables like customer loyalty and customer retention

REFERENCES

1. Ahmad Ch, Rizwan & Asif, Usman; (2011), MS Scholars, Riphah International. University, Islamabad, Pakistan, "An Empirical Study of Analyzing Customer Satisfaction towards Service Quality in Islamic Banks of Sargodha, Pakistan", Interdisciplinary Journal of Contemporary Research in Business, May 2011, Vo.3, No.1
2. Anand Mishra, Anubhav, *"Factors Affecting Customer Satisfaction and Their Relative Importance in the Retail Banking Sector: An Empirical Study*", The IUP Journal of Management Research, Vol. VIII, No. 11, 2009
3. Angur, Madhukar G et al: *"Service quality in the banking industry: an assessment in a developing economy"*, International Journal of bank Marketing, 1999
4. Awan Muhammed Hayyat, Shahzad Bukhari, Khuram, Iqbal Anam**, "***Service quality and customer satisfaction in the banking sector"*, Journal of Islamic Marketing, Vol. 2 No. 3, 2011, pp. 203-224
5. Cui, Charles C et al, "*Employee and Customer perceptions of Service Quality: Match or Mismatch? A Study of Chinese Retail Banking"*, Journal of Asia Pacific Marketing, 2004.
6. Dick A A: *"Market size, Service quality and Competition in banking"*, Journal of Money, Credit and Banking, Vol. 39, No. 1 (February 2007)
7. Ehsan Malik, Muhammed; Basharat Naeem, Arif, Zoune; (2011), "*Impact of Perceived Service quality on Banking Customers' Loyalty*", Interdisciplinary Journal of Contemporary Research in Business, Vol.3, No.8. December 2011.
8. Haghtalab, Hamed, Ahrari, Maryam; Amirusefi, Rasool, (2011), *"Survey Relationship between customer relationship management and service quality, satisfaction and loyalty (Case study Mellat bank)"*, Interdisciplinary Journal of Contemporary Research in Business , Vol.3, No.6, October 2011.
9. Hussain, Mohammed & Leo, Sherly: "*Customer perceptions on service quality in retail banking in Middle East: The case of Qatar*", International Journal of Islamic and Middle Eastern Finance and Management, Vol.2 (4), 2009.
10. Kazi, Omar Siddiqi.,(2011), MSc International Business, Buckinghamshire New University, UK, "*A Survey to Recognize the Most Important Dimensions of the Service Quality of Iran's Commercial Banks*", Journal of Management Research, 2012, Vol. 4, No.4
11. Ladhari, Riadh; Ladhari, Ines & Morales, Miguel, *"Bank service quality: Comparing Canadian and Tunisian customer perceptions"*, International Journal of Bank Marketing Vol. 29 No. 3, 2011 pp. 224-246.
12. Nair, Rajesh: Ranjith P V: Bose, Sumana & Charu C: *"A Study of Service Quality on banks with SERVQUAL Model"*, SIES Journal of Management, Vol.7 (1) Apr-Aug 2010.
13. Nargundkar Rajendra, (2004): *"Services Marketing-text and cases"*, Mc Graw Hill Publications, New Delhi
14. Ravichandran K, Tamilmani B, Arunkumar S,Prabhakaran S: "*Influence of Service Quality on Customer Satisfaction-Application of Servqual Model"*, International Journal of Business and Management Vol. 5, No. 4; April 2010.
15. Santhiyavalli, G, (2011), Department of Commerce, Avinashilingam Deemed University for Women, Coimbatore, India, *"Customer's perception of service quality of State Bank of India - A Factor Analysis"* , International Journal of Management & Business Studies, Vol. 1, Issue 3, September 2011
16. Singla, B; Singh, Amar Inder: *"Essence of Banking Services Marketing: Measuring customer satisfaction"*, Indian management Studies Journal, , Punjabi University, Patiala, 2007: 204-213.
17. Urban, David J; Pratt, Michael D: *"Perceptions of banking services in the wake of bank mergers: an empirical study"*, Journal of Services marketing, Vol.14(2), 2000
18. Zeithaml Valerie, Bitner Mary Jo, Gremler Dwayne D, Pandit Ajay; "*Services Marketing, Integrating Customer focus across the Firm*", 4th Edition, 2008.
19. Zeithaml.V.A. and Bitner. M.J and et al (2006) "*Services marketing: Integrating customer focus across the firm*" Mc Graw Hill/Irwin.

CLASSIFYING STUDENTS PERFORMANCE BY ANALYZING INTERNAL ASSESSMENTS OF STUDENT DATA

M. SATISH KUMAR
ASSOCIATE PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

G SASI KUMAR
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

H NAWAZ
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

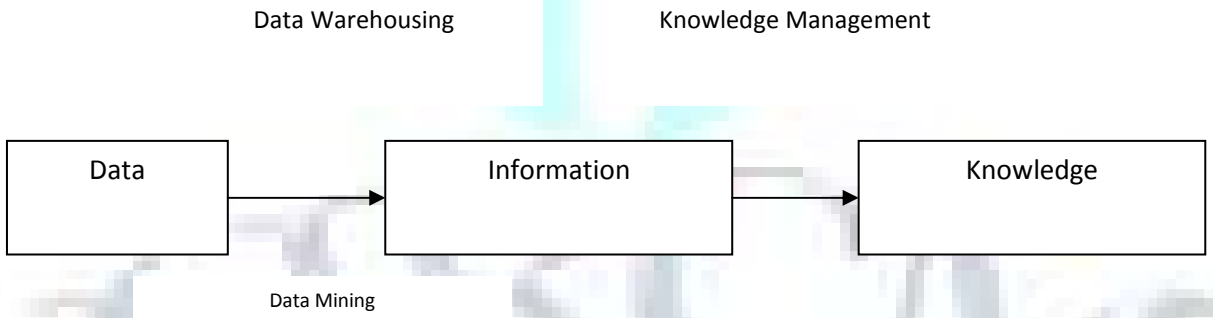
Data Mining is used to extract meaningful information to develop relationships among variables. In this paper the student's performance are analyzed in order to learn how internal assessments will affect the final result. Here classifier algorithm is used to analyze the result attribute. The student internal assessments factors like mid terminal marks, assignments and attendance are studied. This analysis will help the faculty members to motivate students by predicting the final result.

KEYWORDS
Data Mining, classifier algorithm, Assessments, Predicting, Analyzed, Student Performance.

1. INTRODUCTION

Data Mining is data analysis methodology used to identify hidden patterns in a large data set. It has been successfully used in different areas including the education environment. Data mining in educational field is a interesting research area which extracts useful, previously unknown patterns from educational database for better understanding improved educational performance and assessment of the students learning process. It is concerned with developing methods for exploring the unique types of data that confirm educational environment which include student results repository.
As a students' repository is a collection of large amount of students' data, Data Mining and Classification technique can be applied to find interesting relationships between attributes of students.

FIG. 1: CONCEPT OF DATA MINING



As the following Fig.1 shows the concept of Data mining, this involves three steps:
1. Capturing and storing the data
2. Converting the raw data into information
3. Converting the information into knowledge

Data in this context comprises all the raw material an institution collects via normal operation, capturing and storing the data is the first phase that is the process of applying mathematical and statistical formulae to "mine" the data.
The collections of randomly selected student data are examined and assessed by the small group of teaching faculty members. An education reform for the 21st century has generated various models of learning of the performance of students. The assessment of student learning is an essential component in evaluating the overall institutional mid terminal marks, submission of assignments and attending to the class works regularly using J48 classifier algorithm.
Decision Tree analysis is a popular data mining technique that can be used to explain the interdependencies among different variables. In this paper decision Tree is used to extract the classification rules for the student data.
In this paper we analyze which internal assessment will affect more to get better results in the final university exams. It will help the academic planners in enhancing their decision making process in improving students performance.

The remaining sections of the paper are organized as follows: Section 2 describes the importance of Classification in analyzing. Section 3 explains about Data preparation for analyzing. Section 4 reports students' performance by analyzing internal assessments applied on data set. Finally we conclude this paper.

2. IMPORTANCE OF CLASSIFICATION

Databases are rich with hidden information that can be used for intelligent decision making. Classification is a kind of data analysis that can be used to extract models describing important data classes or to predict future data trends. This analysis can help us with better understanding of the data. Classification predicts categorical label.

DATA CLEANING

This alludes to the preprocessing of information in place evacuate or diminish the clamor (by applying smoothing systems, for instance) and the treatment of missing qualities (e.g. by supplanting a missing worth with the most regularly happening quality for that characteristic, or with the most plausible quality in light of measurements). Albeit most arrangement calculations have some mechanisams for taking care of boisterous or missing information, this step can help decrease disarray amid learning.

RELEVANCE ANALYSIS

A number of the traits in the information may be excess. Relationship examination can be utilized to distinguish whether any two given properties are measurably related. Case in point, a solid connection between A1 and A2 would recommend the one of the two could be expelled from further investigation. A database might likewise contain superfluous traits. Trait subset determination can be utilized as a part of these cases to discover a diminished arrangement of properties such that the subsequent likelihood circulation of the information classes is as close as would be prudent to the first appropriation acquired utilizing all characteristics. Subsequently, significance examination, as relationship investigation and trait subset choice, can be utilized to identify qualities that don't add to the arrangement or expectation undertaking. Counting such characteristics might somehow lull, and conceivably delude, the learning step.

Information change and lessening: The information may be changed by standardization, especially when neural systems or strategies including separation estimation are utilized as a part of the learning step. Standardization includes scaling all qualities for a given quality so they fall inside a little determined extent, for example, -1.0 to 1.0 or 0.0 to 1.0. In routines that utilization separation estimations, for instance, this would avoid characteristics with at first expansive reaches (like, say, wage) from out weighting qualities with at first littler extents, (for example, paired traits).

Information cleaning, pertinence examination (as connection investigation and trait subset determination), and information change are depicted in more prominent subtle element.

COMPARING CLASSIFICATION AND PREDICTION METHODS

Grouping and expectation techniques can be contrasted and assessed concurring with the accompanying criteria.

Exactness: The precision of a classifier alludes to the capacity of an offered classifier to effectively foresee the class mark of new or beforehand inconspicuous information (i.e., tuples without class name data). Additionally, the precision of indicator alludes to how well a given indicator can figure the estimation of the anticipated property for new or already inconspicuous information. Precision can be assessed utilizing one or more test sets that are free of the preparation set. Estimation systems, for example, cross-approval and bootstrapping, are depicted. Systems for enhancing the precision of a model are give on the grounds that the exactness registered is just an assessment of how well the classifier or indicator will do on new information tuples, certainty points of confinement can be processed to help gage this appraisal.

SPEED: This alludes to the computational expenses included in producing and utilizing the given classifier or indicator.

VIGOR: This is the capacity of the classifier or indicator to make right expectations given boisterous information or information with missing qualities.

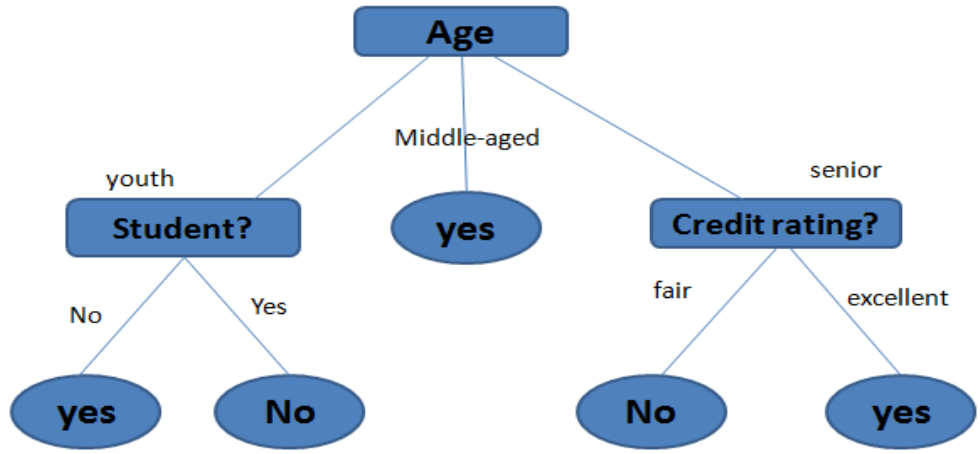
VERSATILITY: This alludes to the capacity to build the classifier or indicator productively given a lot of information.

INTERPRETABILITY: This alludes to the level of comprehension and understanding that is given by the classifier or indicator. Interpretability is subjective and in this manner more hard to evaluate. We talk about some work around there, for example, the extraction of grouping guidelines from a "discovery" neural system classifier got back to proliferation.

CLASSIFICATION BY DECISION TREE INDUCTION

Choice tree incitement is the taking in choice trees from class-marked preparing tuples. A choice tree is a flowchart-like tree structure, where every inward hub (non leaf hub) means a test on a quality, every branch speaks to a result of the test, and every leaf hub (or terminal hub) holds a class mark. The highest hub in a tree is the root hub.

FIG. 2

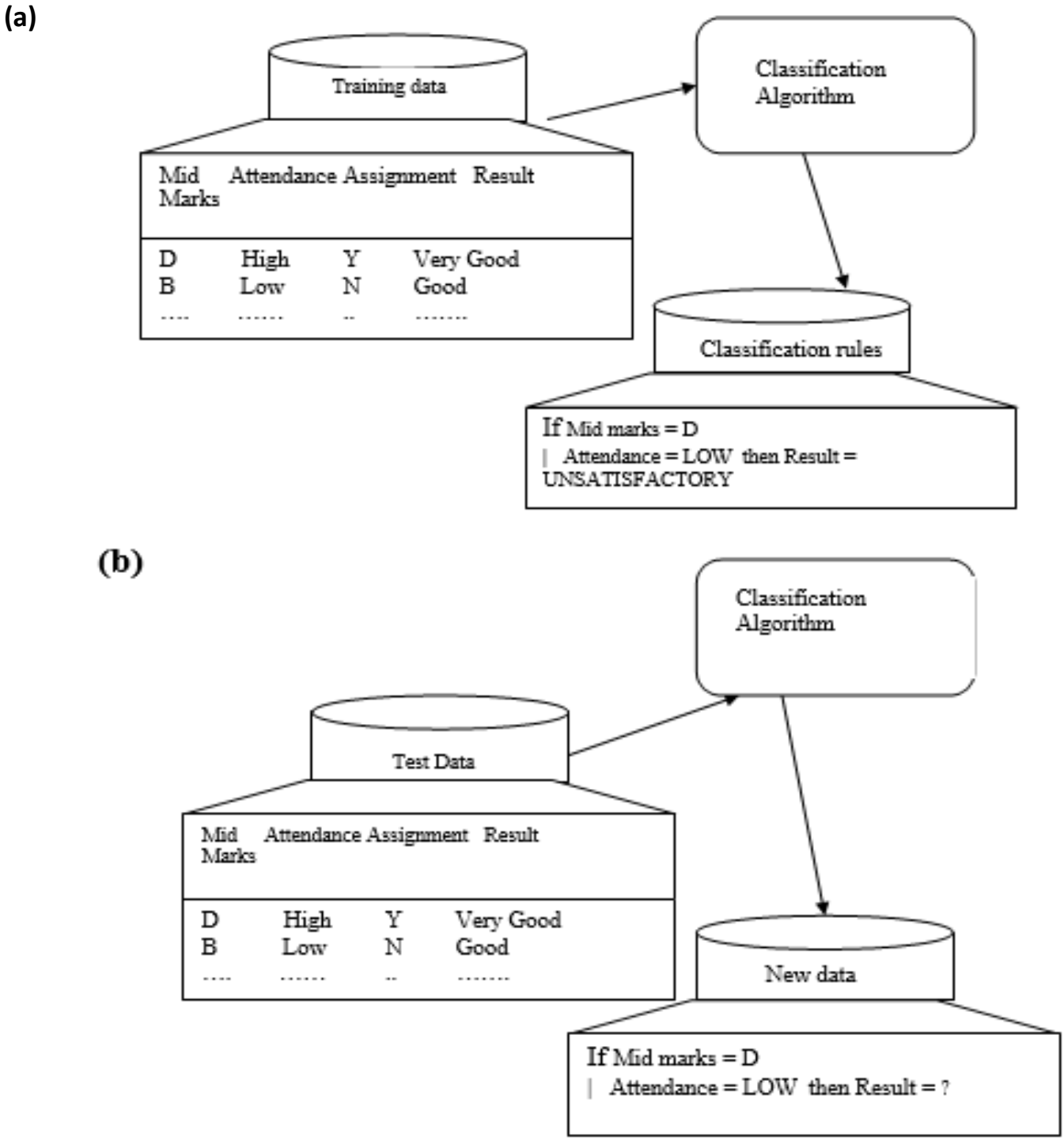


"Why are choice tree classifiers so prevalent?" The development of choice tree classifiers does not require any space learning revelation. Choice trees can deal with high dimensional information. Their representation of procured learning in tree structure is instinctive and for the most part simple to acclimatize by people. The learning and grouping ventures of choice tree affectation are straightforward and quick. As a rule, choice tree classifiers have great exactness. In any case, effective utilization may rely on upon the current information. Choice tree incitement calculations have been utilized for order as a part of numerous application ranges, for example, drug, assembling and creation, budgetary investigation, cosmology, and atomic science. Choice trees are the premise of a few business standard instigation frameworks.

2.1 CATEGORIZATION PROCEDURE

Data classification is a two-step process, as shown in Fig. 3

FIG. 3: CLASSIFICATION PROCESS



2.1.1 SUB-SUBSECTION

When including a sub-subsection you must use, for its heading, small letters, 11pt, left justified, bold, Times New Roman as here.

3. TROUBLE CLARIFICATION

Figures and Tables should be numbered as follows: Fig.1, Fig.2, … etc Table 1, Table 2, ….etc.

If your paper deviates significantly from these specifications, our Publishing House may not be able to include your paper in the Proceedings. When citing references in the text of the abstract, type the corresponding number in square brackets as shown at the end of this sentence [1].

4. CONCLUSION

Please, follow our instructions faithfully, otherwise you have to resubmit your full paper. This will enable us to maintain uniformity in the conference proceedings as well as in the post-conference luxurious books by WSES Press. The better you look, the better we all look. Thank you for your cooperation and contribution. We are looking forward to seeing you at the Conference.

MISSING GIRLS IN INDIA: A NEED FOR SOCIAL MARKETING INITIATIVES

DR. KALE RACHNA RAMESH
ASST. PROFESSOR
SURYADATTA INSTITUTE OF MANAGEMENT & MASS COMMUNICATION
BAVDHAN

SWAPNALI BHOSALE
ASST. PROFESSOR
SURYADATTA INSTITUTE OF MANAGEMENT AND MASS COMMUNICATION,
BAVDHAN

ABSTRACT

Social Marketing is a planned process for influencing change in individuals and the society at large. It is a tool used to sell- ideas, change attitudes and alter behaviour. Social Marketing can be a very effective technique for bringing about a change in a country like India where the society is divided into two compartments. On the one hand we have people with liberal thoughts who are adopting Progressive Global culture. On the other hand there is another section of the society in fact a major chunk of it, which is still in the clutches of orthodox thoughts and views. In spite of being one of the fastest growing economies of the world, India still remains a backward country when it comes to treatment of fairer sex. The practice of female foeticide is still prevalent in India. There are about 100 million missing girls in India and the main reason apart from the various socio-economic causes is the son-preferring attitude of the people in the country. To bring about a change in this regard only the techniques of social marketing can be fruitful. No doubt the Government has taken various initiatives in this regard but still the problem remains very grave. The author of this paper firmly believes that we can bring a change in this only through social marketing. This paper aims to bring to light the grave problem of missing girls in India- its causes and consequences. Also it tries to bring forth the importance of Social Marketing in dealing with such socio-economic issues.

KEYWORDS
missing girls, social marketing.

INTRODUCTION

"Why can't you sell brotherhood like you sell soap" G.D. Wiebe (1958) had said. The theme was really path breaking.
Social marketing is becoming increasingly relevant in all developing countries which economists say belong to third world. India is one of the fastest growing economies of the world but still falls in the category of a third world country? Mass poverty, voluminous unemployment, vast homelessness, deplorable status of public health and sanitation make India economically as well as and socially backward. Some parameters like high infant mortality rate and high illiteracy take India in to the "fourth world" according to Ronald J. Sider (1983).
India faces gigantic social and health problems like the diarrhoea, night-blindness, polio, worm infestation, HIV, traffic accidents, human slavery and human, trafficking, dowry system, domestic violence and unwanted pregnancies have roots in wrong attitudes and related behavioural causes. All of these are the result of the human activities and to overcome these problems bringing about change in the attitude and mind-set of the people is the only solution. Social marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviours that benefit individuals and communities for the greater social good.
Attitudes are anchored deep and can attitudes be changed is another question the sociologists are confronted with. Eminent sociologists have suggested that attitudes can change in the face of new evidence, new logic and new set of social benefits.

LITERATURE REVIEW

Alan Andreasen (2001) in his book outlines the potential roles of social marketers, restates fundamental principles of social marketing, and then suggests how social marketing might be applied to a sample of non-traditional challenges. This book also shows how social marketing influences governments, corporations and NGO's as well as individual behaviour.
Rob Donovan and Nadine Henley (2010) in their book combine the latest research with real- life examples of social marketing campaigns the world over to help you learn how to apply the principles and methods of marketing to a broad range of social issues. The international case studies and applications show how social marketing campaigns are being used across the world to influence changes in behaviour and reveal how these campaigns can differ according to their cultural context and subject matter.
Gerard Hastings, Kathyrn Angus and Carol Bryant (2012) in their handbook brings together a systematic framework and state of art thinking to provide complete coverage of the social marketing discipline.
Sameer Deshpande and Nancy. R. Lee (2013) have structured their book around the ten step marketing planning process that trains and encourages social change managers to undertake a systematic and comprehensive approach to behaviour change rather than jumping to the stage of producing just ads.

SOCIAL MARKETING

Social marketing was "born" as a discipline in the 1970s, when Philip Kotler and Gerald Zaltman realized that the same marketing principles that were being used to sell products to consumers could be used to "sell" ideas, attitudes and behaviours. Kotler and Andreasen define social marketing as "differing from other areas of marketing only with respect to the objectives of the marketer and his or her organization. Social marketing seeks to influence social behaviours not to benefit the marketer, but to benefit the target audience and the general society.[1] "www.Social-marketing.com. Most powerful social marketing has been done by Wael Ghonim of Egypt in 2011, he became an international figure and energized pro-democracy demonstrations in Egypt after his emotional interview following 11 days of secret incarceration by Egyptian police—during which he was interrogated regarding his work as the anonymous administrator of the Facebook page, "We are all Khaled Saeed", which helped spark the revolution. *TIME* magazine included him in its "Time 100" list of 100 most influential people of 2011, and the World Economic Forum have selected him as one of the Young Global Leaders in 2012.
Social Marketing is a set of evidence- and experience-based concepts and principles that provide a systematic approach to understanding behaviour and modifying it for social good. It is not a science but rather a form of 'technik'; a fusion of science, practical know-how, and reflective practice focusing on continuously improving the performance of programmes aimed at producing net social good —Jeff French, 2011
Social marketing, like generic marketing, is not a theory in itself. Rather, it is a framework or structure that draws from many other bodies of knowledge such as psychology, sociology, and anthropology & communications theory to understand how to influence people's behaviour. Like generic marketing, social marketing offers a logical planning process involving consumer oriented research, marketing analysis, market segmentation, objective setting and the identification of strategies and tactics. It is based on the voluntary exchange of costs and benefits between two or more parties.[2] (Kotler and Zaltman, 1971). However, social marketing is more difficult than generic marketing. It involves changing intractable behaviours, in complex economic, social and political climates with often very

limited resources.[3] (Lefebvre and Flora, 1988) Furthermore, while, for generic marketing the ultimate goal is to meet shareholder objectives, for the social marketer the bottom line is to meet society's desire to improve its citizens' quality of life.

PURPOSE OF THE STUDY

This paper is set up in the context of the Indian environment with the following objectives:

1. To understand what is social marketing.
2. To understand the various socio - economic problems of India especially the female foeticide.
3. To understand how the social marketing tools can help in fighting female foeticide.

RESEARCH DESIGN AND METHODS

The research methods used in this paper are purely qualitative in nature and the research design is exploratory in nature.

PAID AND UNPAID SOCIAL MARKETING

While actor Amir khan asking all of us to keep the environment clean, actress Vidya Balan asking rural families to build latrines for women folk and Amitabh Bacchan asking people to give polio oral dose to children they are being paid huge sums by Director of Audio Visual Publicity Government of India (DAVP), whereas People like Wael Ghonim, Medha Patkar, Anna Hazaare never get paid. Even though they impact the society most powerfully.

WHY IS SOCIAL MARKETING IMPORTANT?

There are few major advantages, however, which suggest that social marketing is worthy, of your consideration:

1. It helps in influencing behaviour.
2. It helps you reach the target audiences you want to reach.
3. It helps you customize your message to those targeted audiences; and by doing so,
4. It helps you create greater and longer-lasting behaviour change in those audiences.
5. Finally, it helps in delivering a positive benefit for society.

SOCIAL ISSUES TO BENEFIT FROM SOCIAL MARKETING

These are the issues which can be tackled with using social marketing tools and techniques:

- ✓ **Health-Related Behaviours to Impact:** Tobacco Use, Heavy/Binge Drinking, Foetal Alcohol Syndrome, Obesity, Teen Pregnancy, HIV/AIDS, Fruit and Vegetable Intake, High Cholesterol, Breastfeeding, Breast Cancer, Prostate Cancer, Colon Cancer, Birth Defects, Immunizations, Skin Cancer, Oral Health, Diabetes, Blood Pressure, Eating Disorders.
- ✓ **Injury Prevention-Related Behaviours to Impact:** Drinking and Driving, Seatbelts, Head Injuries, Proper Safety Restraints for Children in Cars, Suicides, Domestic Violence, Gun Storage, School Violence, Fires, Falls, Household Poisons.
- ✓ **Environmental Behaviours to Impact:** Waste Reduction, Wildlife Habitat Protection, Forest Destruction, Toxic Fertilizers and Pesticides, Water Conservation, Air Pollution and Automobiles, Air Pollution.
- ✓ **Environmental Behaviours to Impact:** Waste Reduction, Wildlife Habitat Protection, Forest Destruction, Toxic Fertilizers and Pesticides, Water Conservation, Air Pollution and Automobiles, Air Pollution from other Sources, Compositing Garbage and Yard Waste, Unintentional Fires, Litter, Watershed Protection.
- ✓ **Community Involvement Behaviours to Impact:** Organ Donation, Blood Donation, Voting, Literacy, Identity theft, Animal Adaptation.
- ✓ **Financial Behaviours to Impact:** Establishing Bank Accounts, Bankruptcy, Fraud.

INDIAN CONTEXT

When one side of India is being celebrated as a fast growing economy and as a hub of tremendously developing scientific and technological human resources, the other side of the story appears to be grim; amid many challenges that the country is still struggling to meet, poor status of our women stands prime. Women form the unequal half of our society- in terms of vulnerability, marginalisation and exclusion in most of the cases, with few exceptions. Amongst all kinds of discriminations, female population of the country is struggling through the life: there are lot of issues to be addressed- falling sex ratio, poor literacy levels, weaker formal education levels, bad nutrition status, high morbidity and mortality, lesser leadership opportunities, lack of self-reliance, inadequate empowerment measures all these issues tend to affect this section predominantly, which is related to various socio-economic factors, environment, gender discrimination and domestic violence against women.[4] (Women and Science)

MISSING GIRLS IN INDIA

In 1990, Dr Amartya Sen coined the term "Missing Women" to denote the shortage of women contributing to the skewed sex ratios in Asia and Africa, where men outnumber women in stark contrast to North America and Europe, where women outnumber men. Estimates of missing women were originally meant to represent some measure of the degree of gender discrimination.

Sex ratio is defined as the number of females per thousand males. It is an important indicator to access relative excess of deficit of men or women in a given population at that point of time. The below given table shows the sex ratio of India over the years from 1901 till date. In India Sex Ratio was okay till the time of Independence thereafter it declined regularly.

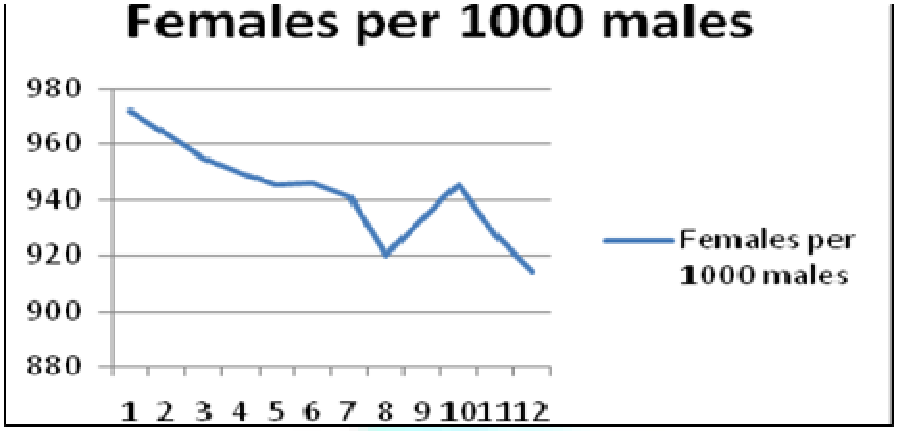
TABLE 1: MALE/FEMALE SEX RATIO OF INDIA

Year	Females per 1000 Males
1901	972
1911	964
1921	955
1931	950
1941	945
1951	946
1961	941
1971	920
1981	933
1991	945
2001	927
2011	914
2012	940

Sources: Census of India and Government of India Report.

According to Census of India 2011, Indian sex ratio has shown some improvement in the last 10 years which is clearly evident from the figure given below. It was 940, 941 and 943 in the year 2012, 2013 and 2014 respectively. But still the picture for females in India is highly dismal. As per UNICEF Annual Report 2011, worldwide the ratio of girls to boys is 1005 for every 1000, whereas for India, there are only 940 girls for every 1000 boys.

FIGURE NO. 1: SEX RATIO IN INDIA DURING 2001 AND 2011



Imbalance in the sex ratio may lead to further decline in the status of women, increase in violence against women, practices of polyandry etc.

GENDER DISCRIMINATION IN INDIA

Gender Discrimination is a term which means discrimination because of the gender. It continues to be an enormous problem within Indian society. Traditional patriarchal values and norms have always given women a secondary status. Girl child are always given a low value, they are often neglected resulting in higher mortality of girls as compared to boys. This fact is clearly evident from the data available on infant mortality for the year 2009. Mortality rate of female is higher than male in all the states except for one or two states where it is equal.

TABLE 2: INFANT MORTALITY RATE 2009

Sr No	State	Male	Female	Male-Female Gap
1	Andhra Pradesh	48	50	-2
2	Arunachal Pradesh	31	34	-3
3	Assam	58	64	-6
4	Bihar	52	52	0
5	Chhattisgarh	50	57	-7
6	Delhi	31	34	-3
7	Goa	7	14	-7
8	Gujarat	47	48	-1
9	Haryana	48	53	-5
10	Himachal Pradesh	44	45	-1
11	Jammu and Kashmir	41	51	-10
12	Jharkhand	42	46	-4
13	Karnataka	41	42	-1
14	Kerala	10	13	-3
15	Madhya Pradesh	66	68	-2
16	Maharashtra	28	33	-5
17	Manipur	14	18	-4
18	Meghalaya	59	59	0
19	Mizoram	33	38	-5
20	Orissa	65	66	-1
21	Punjab	37	39	-2
22	Rajasthan	58	61	-3
23	Tamil Nadu	27	29	-2
24	Tripura	30	33	-3
25	Uttar Pradesh	62	65	-3
26	Uttarakhand	41	42	-1
27	West Bengal	33	33	0
28	All India	49	52	-3

Source: India Human Development Report 2011

According to the report "The World of India's Girls (WINGS)" discrimination faced by Indian girls reveals that not only does the fight for survival of the Indian girl child begin in the womb; discriminatory practices plague things as basic as immunization and the quality of education.

The proportion of male children who are fully immunized is 4 per cent higher than female children. By the time girls are four years old, they are much more likely to be stunted or underweight than their brothers. In 2012, 58 per cent of all primary school children in the age group of 6-14 years were boys. Also, girls with special needs have lesser access to education than their male counterparts.[5] (The World of India's Girls WINGS)

INITIATIVES BY THE GOVERNMENT FOR THE PROTECTION OF GIRL CHILD

The Ministry of Health & Family Welfare has adopted a multi-pronged strategy to check female foeticide, which includes legislative measures, awareness generation as well as programmes for socio-economic empowerment of women.

The steps taken by the government to prevent female foeticide under the Pre conception and Pre natal Diagnostic Techniques (Prohibition of Sex Selection) Act, 1994, PC & PNDT Act include the following:

Reconstitution of statutory bodies under the Act and regular meetings of the Central Supervisory Board, State Supervisory Board and Advisory Committees to monitor effective implementation of the law.

Rule 11(2) of the PC & PNDT Rules, 1996 has been amended to provide for confiscation of unregistered machines and further punishment of organizations which fail to register themselves under the Act.

Dedicated PNDT cells have been set up at State/district level for enhancing in-house capacities for building credible cases for conviction against violations of the Act.

Surprise field inspections of ultrasound clinics by the National Inspection and Monitoring Committee (NIMC) in states/UTs against violations under the Act.

NIMC has been further empowered to oversee follow-up action by Appropriate Authorities against organizations found guilty of violations under the Act during inspections.

Sensitization and training programme have been conducted for law enforcers, medical practitioners, judiciary etc. for effective implementation of the Act.

Comprehensive Information, Education & Communication (IEC) activities including mass media awareness campaign through print and electronic media and community mobilization through Non-Governmental Organizations have also been undertaken.

Besides the Central Government as well as various State Government has initiated various programmes time to time to fight the evil of female foeticide, viz; Balika SamridhiYojana, Girl Child Protection Scheme, Rakshak Yojana, Mukhyamantri Kanyadan Yojana, Ladli Laxmi Yojana, Bhagya Lakshmi Scheme, Mukhyamantri Kanya Suraksha Yojana, Mukhyamantri Kanya Vivah Yojana, Beti Hai Anmol Scheme etc.

CONCLUSIONS

Female feticide is one extreme manifestation of violence against women. Although serious efforts and resources has been put to use by the Central Government, State Government, Non-Government Organizations (NGO's) etc a very little success has been achieved so far. Year on year a huge quantum of money has been released by the Government to fight this evil but nothing fruitful has been gained in this regard. The cause of continued female feticide in India are deep rooted beliefs and attitudes of the people like a strong male preference, the belief that son can only perform last rites and the consequences include problems like skewed sex ratio, shortage of girls for marriage, trafficking and prostitution, increasing number of child marriages, increasing maternal deaths and ill-health of women, increase in polyandry and many more socio-economic issues. The problem being related to the behavioral aspects of the individual the solution of it lies in Social marketing. Since Social Marketing seeks to develop and integrate marketing concepts with other approaches to influence behaviors that benefit individuals and communities for the greater social good. The world would be cozier, warmer and more serendipitous if we had more sisters, mothers, nurses, house keepers, female teachers, female receptionists, female secretaries and female traffic police.

RECOMMENDATIONS

STAGES OF SUCCESSFUL SOCIAL MARKETING EFFORT

Social Marketing is a planned process for influencing change. It seeks to influence social behaviors not to benefit the marketer but to benefit the target audience and the general society. The model of Behavior Change given by Prochaska et al. (1992)[6] can be adopted to stop the evil of female feticide in the country. The five stages of Behavior Change described by are the five stages or steps integral to Social Marketing.

FIG. 2

Sources: Grimley 1997 (75) and Prochaska 1992 (148)

First step is Pre-contemplation (unaware of the problem) when the problem situation exists but we are not aware about the problem. If we look at the sex ratio of India after Independence we find that it has been continuously declining but we started thinking about it only in the 90's.

Second step is Contemplation (aware of the problem and the desired behavior change) when awareness has to be created among the masses that your present behavior or present ignorance is harmful, detrimental and bad unfolding the darker side of it. The evils and consequences of female feticide are very grave for the society in the long run. It creates lots of problems like child marriage, polyandry, human trafficking etc. It is therefore very essential that people should be made aware about the consequences. Since India is a land of diversity, majority of the people being illiterate and knowing vernacular language. The campaign, the message should be so framed that everybody understands it very clearly. Not only is the message to be conveyed to the people, it needs to make sense for their lives as well.

Third stage is Preparation (intends to take action). This can happen only after knowing that problem exists and we should change our behavior accordingly.

Then the fourth step of action (practice of desired behavior) would emerge sequentially that of changing or dishing out the right behavior to the audience.

The repetition of the right attitude is the last step of maintenance (works to sustain the right behavior).

Thus telling what is wrong with the masses, then asking them to pick up what is right and then compelling them with persuasion to stick to the changed new, desired behavior. This mode appears simplistic but it has great potential. In the DAVP social ad clip on the television by celebrity Vidya Balan first part is of telling the masses how bad it is to defecate in open. The telling masses to build latrines and use the latrines. Creating awareness about the lacunae and the motivating to fill the lacunae and compelling to stick to the newly acquired behavior are the five steps in social marketing

REFERENCES

1. Bandewar, S. (2003). Abortion Services and Providers' Perceptions: Gender Dimensions. Economic and Political Weekly, Vol. XXXVIII No.21 May 24-30, 2003, pp. 2075-2081.
2. Bloom, P.N. and Novelli, W.B. "Problems and Challenges in Social Marketing," Journal of Marketing, (45), 1981, pp. 78-88.
3. Fox, K. and Kotler, P., "The Marketing of Social Cause - The First 10 Years," Journal of Marketing, (44), 1980, pp. 24-28.
4. Gendercide. (2010, March 4). The Economist. Retrieved September 20, 2012, from http://www.economist.com/ node/15606229.
5. Gupta, A. (2007). Female Foeticide in India. In Unicef Media Centre. Retrieved August 14, 2012, from http://www.unicef.org/india/media_3285.htm.
6. http://www.vigyanprasar.gov.in/Radioserials/9discrimination.pdf
7. Kotler P, Zaltman G (1971). Social marketing: an approach to planned social change. Journal of Marketing, 35: 3-12.
8. Lefebvre RC, Flora J A (1988). Social marketing and public health intervention .Health Education Quarterly, 15(3): 299-315.
9. Patel, V. (1994). Indian Women's struggle to survive: Campaign against feticide. In: UNICEF, The Child and The Law, New Delhi; UNICEF 1994. pp. 60-61.
10. Prochaska et al http: //www. Forestry. gov. uk /pdf /behaviour _review_ theory. Pdf /$ file /behaviour_review_theory.pdf
11. Srivastava, S.P. (2001). The Perils of Pre-Birth Murder – A Sociological Analysis of Female Foeticide Journal of Social Welfare, Vol.47, No. 10 January 2001. pp. 7-12.
12. Tandon, S .L. & Sharma, R. (2006).Female Foeticide and Infanticide in India: An Analysis of Crimes against Girl Children. International Journal of Criminal Justice Sciences, Vol1, Issue 1.
13. The World of India's Girls (WINGS)http://indianexpress.com/article/india/india-others/gender-bias-in-india-extends-to-immunisation-education-report/
14. World Health Organisation. (2011). Preventing Gender-Biased Sex Selection: An Interagency Statement OHCHR, UNFPA, UNICEF, UN Women and WHO (N L M classification: QS 638). Geneva, Switzerland. In United Nations Population Fund. Retrieved September 14,2012,fromhttp://www.unfpa.org/webdav/site/global/shared/documents/publications/2011/Preventing_genderbiased_sex_selection.pdf.
15. www.social-marketing.com.
16. www.strategic-social-marketing.vpweb.co.uk/default.html

A STUDY OF INCREASING THE PERFORMANCE OF ANDROID

T RAMATHULASI
ASST. PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

M VISHNUVARDHAN REDDY
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

K GEETHANJALI
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Nowadays, a smart phone is an indispensable tool for everyday living and smart phone enthusiasts are eager to upgrade the performance of their devices. In this paper we present an approach to improve the performance of a smart phone. It is user friendly. Detailed procedures of these optimization steps are provided which ordinary users can apply. It is user friendly. Using these same techniques, we performed optimizing experiments on an Android phone and included the results. Memory cleaning also showed significant savings in terms of memory space in the device. Here we discuss about the performance matters and challenges.

KEYWORDS
Performance Upgrade, Bugs and Battery Life.

INTRODUCTION

Performance is quite the buzzword these days. In just the field of mobile applications, it can mean a number of different things: from how an application is implemented, how it works, how efficient it is at how it works, and if all of these aspects were indeed enjoyable. From an Android perspective, we'll be looking at how well our app behaves across thousands of different devices, all with varying OS SDk levels, screens, processors, etc. While just getting our app to run (and hopefully render correctly) across such a distribution of devices is daunting on its own, we want to take our application a step further, and make it run **well** on the 19,000 different Android devices, giving EVERY user the ultimate experience for our Android app. We will be looking at performance specifically in terms of applications power management, efficiency, and speed. We'll explore tools that will help us identify and pinpoint the performance issues typically found in Android applications, and once we find the issues, discuss potential remedies. Some fixes will be quick and easy wins. Other ideas may require more work, code refactoring, and potentially major architectural changes to our mobile application. This may not always be feasible, but knowing where our apps weaknesses are can help us as we iterate and improve our mobile app over time.

We will learn the techniques to benchmark our application, and the tricks to improve the efficiency, performance and the speed of our application. This will improve our application's performance, the inner workings will be faster, which will lead to a more streamlined and enjoyable application performance for the end user.

PERFORMANCE MATTERS

Mobile application performance is extremely important. We all absently pull out their phone and fire up an application. Because Android users use applications as a distraction, they are easily distracted, and often multitasking. If our app does not hold their interest through the many distractions of the day, our app usage and engagement will plummet. Human engagement studies show that actions that take under 100ms are perceived as instant, where actions that take a second or more a/llow the human mind to become distracted. Delays and slowness in our app (even if just perceived slowness) are a detriment to our mobile app, and potentially to our customer's phones too (a study in 2012 found that slow apps caused 4% of users to throw their phone!).

Imagine an e-commerce application. This application has collected analytics showing that the average e-commerce session is 5 minutes long, and each screen load takes an average of 10 seconds to complete. Our screen view budget/session is 30 views to complete a sale. If we are able to lower the load time of each view by 1 second, we have added 3 more screen views to the average session. This could allow our customers to add more items to their cart, or perhaps just complete the entire transaction 30 seconds faster!

This completely made up scenario is actually backed by real world data. A one second delay in webpage load time leads to 7% drop in sales 11% fewer page views 16% drop in customer satisfaction.

Amazon.com has discovered similar statistics. When they added just 100ms of delay to webpage's, their revenue dropped by 1%. Shopzilla re-architected their website for performance, and saw page views increase by 25%, increased conversions by 7-12%, and actually used half the nodes they previously required!

Beyond sales and revenue, mobile applications with poor performance get lower rankings in Google Play. Even worse, bad apps have been pulled from the market. In 2011, T-Mobile asked Google remove the YouMail application from the Android Market. YouMail is a 3rd party voicemail app, and this application polled its server every second to ask "Is there new voicemail?" An install base of ~8,000 customers on T-Mobile generated more hits on the network than Facebook! Arguably, this all occurred prior to widespread usage of Google Cloud push messaging. But applications with similar behavior are still in Google Play today, and as we will see, they have detrimental performance effects on servers, networks and Android devices.

Sometimes our architecture is good enough for launch, but what happens when we get bigger? What if our app gets an ad placed during the next Super Bowl? Is our app/server architecture ready for fast exponential growth?

ANDROID PERFORMANCE CHALLENGES

Building an Android application is a complicated process. From phones with screens that go from teeny 240x360 to 1440x2560 pixels ratios and dozens of variations in between (and that is just the phones!). Not only does your application need to look great on phones, phablets and tablets, but it has to run on devices running a dozen different variants of the Android operating system. As of September 2014, 88% of Android users are using devices running OS versions Ice Cream Sandwich (or higher). Supporting just these users still requires us to support 7 levels of the Android SDK. Contrast this Android complexity with iOS development, where we have 6 devices with screen sizes, and in October 2014, 2 versions of the OS (7 and 8) made up 92% of all users.

These devices, despite their multitudes of differences, all contain amazing computing horsepower, location awareness and the internet. With all of these challenges, it is no wonder that application performance can be difficult. I hope that this book will help us slay some of the beasts and gremlins that are causing delays, jitter and other performance issues common to mobile applications.

We are building an Android application (or we already have.) Despite this, we are not totally happy with our apps performance? (why else did we pick up this book?) Uncovering mobile performance issues is a job that is never complete. There will always be opportunities to squeeze more performance out of our application, and new inefficiencies will arise as a part of new feature development. The goal of this book is to help understand the pitfalls of mobile performance, expose some of the tools to test for issues so that we can catch any major performance issues in our mobile application before it impacts our customers.

LAUNCHING WITH BUGS

With such a complicated development platform, it is inevitable that some bugs will slip through our testing processes and affect customers. However, a recent study showed that 44% of Android app issues and bugs were discovered by users, and 24% of those were actually passed on to the developers by users leaving feedback in Google Play reviews. Negative reviews are not the way we want to discover issues. Not only is one customer frustrated, but all of our future potential customers will have the ability to see our dirty laundry when they look at the reviews. When customers see reviews discussing bugs and problems with our app, they may decide to not continue the download. If we are using advertising for customers, we know the costs of customer acquisition. As the number of apps have increased and the Play store has become more crowded, customer acquisition has gotten more expensive, so anything that discourages download of our app is costing you money!

There is a huge push in the software industry to launch as quickly as possible, and clean up the bugs and residual issues in a subsequent release. QA time is always at a premium, and is nearly always the first item on the chopping block for a tight schedule. While in sports, the MVP is the star of the game, in development, the Minimally Viable Product is a development curse we have all faced. Launch with just enough launch first and build (or fix) the rest later. Development of Android apps is no different, but there is an impact to our customers, and it is crucial that we understand the side effects of launching with major performance issues.

CONSUMER REACTION TO PERFORMANCE BUGS

Mobile applications usage is incredibly different from the web or other forms of software. App user retention is a hard nut to crack - in 2014, 16% of downloaded Android apps is launched only once. Customers are easily distracted, and with so many choices in the app markets, they will quickly try another app that is similar, or does the same thing.

Now there could be many reasons that users abandon apps. It can be argued that being frustrated with an application is a top reason to abandon or uninstall. According to a study by Perfect Mobile the top user frustrations are:

1. User Interface Issues (58%)
2. Performance (52%)
3. Functionality (50%)
4. Device Compatibility (45%)

While performance is directly called out as the #2 reason for customer frustration, it is clear that the other top 4 responses also have aspects of performance to them. It becomes pretty clear that the major reasons customers stop using apps are due to issues related to performance.

Adopting a MVP approach to your Android app, where the initial launch contains bugs and performance sinks assumes that when the fixes are made, you:

1. Still have an audience
2. They update your application and
3. They launch the updated app to see the improvements

Twitter has reported that it takes 3 days for 50% of their users to upgrade their Android app, and 14 days for 75% of the user base to update to the latest version. They find this to be extremely repeatable. So if we are not uninstalled, you still have to hope that your updates are:

1. Actually updated.
2. Opened up so that the fixes are seen.

SMARTPHONE BATTERY LIFE - THE CANARY IN THE COAL MINE

The studies above show that consumers prefer fast apps, and apps that do things quickly. Additionally, one of the top concerns of smart phone owners is battery life. While it is not (yet) common knowledge to customers, applications (and especially non-optimized applications) can be a MAJOR factor in battery drain. I use my end of day battery percentage as an indicator of how apps are performing on my phone. If I notice a sudden dip in battery life, I begin to investigate recently downloaded apps for potential issues. We'll show how battery drain of the mobile device can be used as a proxy for application performance, and how improving the performance of our app will extend our customers battery life.

That said, the top drainers of mobile battery are the screen, the cellular and Wi-Fi radios, and other transmitters (think Bluetooth or GPS). We all know that the screen has to be on to use different apps, but the way our mobile app utilizes the other power draining features of a mobile device can have huge effects on battery life.

Consumers typically blame the device, device manufacturer or the carrier for device battery issues. The tools available to consumers displaying how applications drain the battery only just now coming to market, but the quality is radials improving. It is only a matter of time before consumer consciousness of battery life as related to apps really takes off. Thankfully, the tools for developers to minimize power drain are also beginning to surface, and we'll explore these tools. It is best to be as battery and power conscious as we can while architecting and building our mobile applications.

CUSTOMERS WANT HIGHLY RESPONSIVE APPS

If we have not come to this conclusion before picking up this book, I hope that the above examples have shown you how important application performance really is. If customers are reporting bugs in our app rankings (which discourages future customers), and people walk away from and uninstall poorly performing apps, it is obviously imperative that our application runs with as few performance issues at initial launch. MVP launches, and slow apps with poor performance are rarely given a second chance - it is uninstalled, and never downloaded again - even if V1.1 has all the right fixes in it. By then, we are too late for those initial customers.

TESTING OUR APP FOR PERFORMANCE ISSUES

The best way (pre-launch) to discover performance issues is to test, test and test some more. I'll cover the devices you should use for testing in order to cover as much of the Android ecosystem as possible. In subsequent chapters, I'll walk through many of the tools available to help us diagnose performance issues, and

tips to resolve them. Once we are in market, ensure that our app reports back to we on usage patterns and issues that our customers are facing. Read these reports, and dissect the information so that we can resolve issues discovered in the field.

SYNTHETIC TESTING

Synthetic tests are created in the lab, to test specific use cases, or perhaps to mimic user behaviors in your mobile application. Many of the tools we'll discuss in future chapters run with synthetic tests - where we as a developer, run our app through its paces, and look for anomalies. This is a great way to work many bugs and performance issues. However, with 19.000 Android User agents reported by Akamai, there is no way we can possibly run synthetic test for every possible scenario.

RUM TESTING

I know, that sounds really promising, doesn't it? "Hey boss, the team needs to go out and test out our RUM." RUM really stands for Real User Measurements. Because it is unlikely that you will be able to find all of our apps performance issues prior to launch in our synthetic tests, and it is not realistic to assume our customers will report all of the issues they see, we need another option. By inserting analytics libraries into our application, we can collect real time data from all of our users - allowing us to quickly understand them types of issues they might be facing. This gives us the chance to respond to customer issues/bugs that are discovered in the field. Of course, once resolved, it is smart to find ways to replicate such issues in the lab - to avoid future releases with issues.

5 WAYS TO INCREASE THE ANDROID PHONE'S PERFORMANCE

If our Android's performance is starting to sag, don't worry. There are several steps we can take to restore our device to working order. Use these five tips to stay vigilant against performance lag by updating problem apps and managing system resources. Want step-by-step instructions to speed up our device? Keep reading for 5 Ways to Boost our Android Phone's Performance, the second installment of our six-part Android Phone Makeover series.

FIG. 1: INCREASE PERFORMANCE

1. KILL BACK GROUND APPS

Android's capability to multitask across several applications is great, but you don't need the YouTube app wasting battery life and memory resources when running in the background. It's best to completely close apps with the Advanced Task Killer app (free). Unlike Android's built-in app shutdown, this download shows a single list of each running app on our device and lets you select the ones you'd like to turn off.

FIG. 2: KILL SELECTED TASKS

2. KEEP APPS UP TO DATE

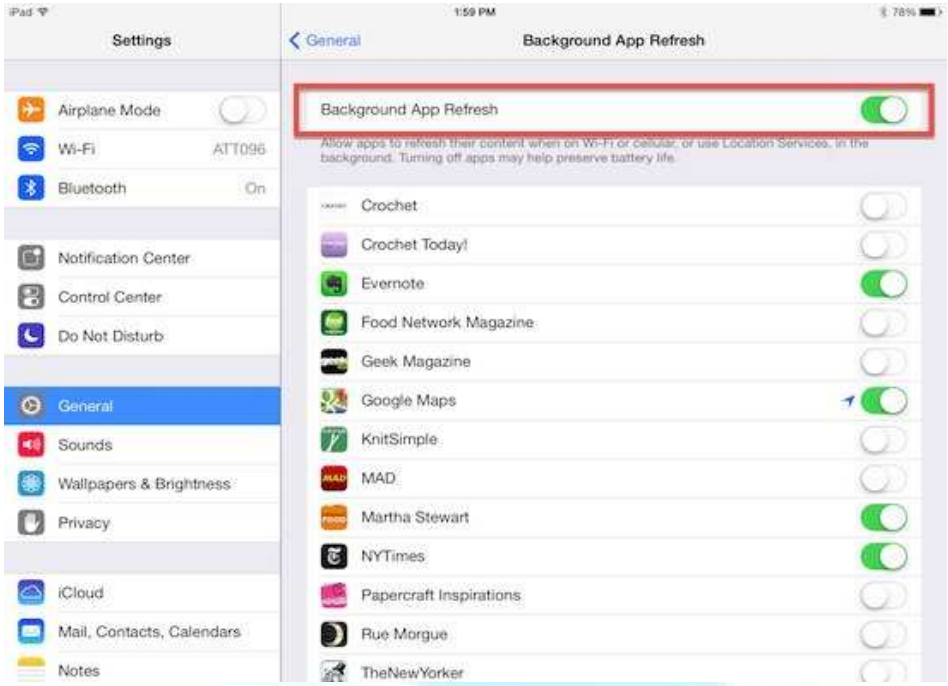
It's not always the operating system that causes you grief. If you feel an app is slowing you—or your phone—down, check the Android Market for an update.

1. Launch the Android market. Tap the menu button.
2. Select my apps.
3. Check each app for updates on the right.

3. TURN OFF BACKGROUND DATA

Apps aren't the only thing to run in the background. Such services as Face book, Twitter or Weather Bug constantly downloads data so that when you launch them, all the content is up to date. That's easy to stop.

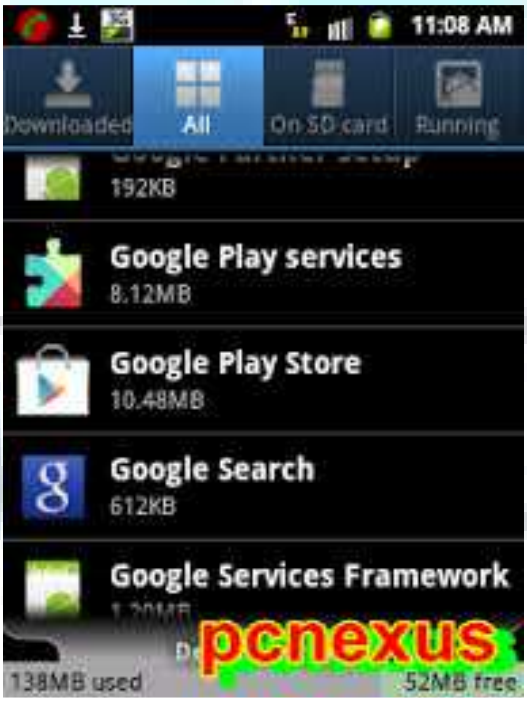
FIG. 3: BACKGROUND APP



4. MANAGE GOOGLE SERVICES

An Android device automatically includes access to Google services including Books, Contacts, Currents, Gmail and Google+. If we don't need these services, turn them off and save our wireless radio the trouble of downloading more data (pictured below).

FIG. 4: GOOGLE SERVICES



5. DEFRAG OUR SMARTPHONE'S MEMORY

Just like a PC, our Android phone's internal RAM gets a performance boost after undergoing defragmentation. A free app called Memory Booster ($2.99 for the full version) in the Android Market not only defrags our phone's random- access memory, it also repairs data leaks from damaged apps. we can only run a memory boost every 10 minutes.

But if we want to keep track of just how much RAM we retrieve each boost set the apps to send a notification when new adjustments are complete. For a truly superlative uptick in performance, set the boost level to ultimate (available in paid version only).

1. Launch the app.
2. Tap the menu button.

3. Choose ultimate boost.
4. Select boost level manager.

CONCLUSION

Android development is not a simple nut to crack. Just getting an app to run on thousands of devices is a challenge in and of itself. More than just running, our customers expect us through the performance issues that Android developers face, how to test for these issues, and how to resolve them. As our application becomes faster and more streamlined, we'll find that our customers become more engaged and leave better reviews for our application.

REFERENCES

1. A. Mathur, M. Cao, S. Bhattacharya, A. Dilger, A. Tomas, and L. Vivier. The new ext4 filesystem: current status and future plans. In *Proc. of the Linux Symposium, Ottawa*, 2007.
2. Analyzing Performance in Service Organizations -- Journal Article [Kindle Edition] H. David Sherman (Author), Joe Zhu (Author).
3. G. Jindal, M. Jain, "A Comparative Study of Mobile Phone's Operating Systems", International Journal of Computer Applications & Information Technology, Vol. 1, Issue 3, November 2012.
4. I. V. Koskosas and N. Asimopoulos, "Information System Security Goals", International Journal of Advanced Science and Technology, vol. 27, (2011).
5. K. Purdy, "Five Great Reasons to Root Your Android Phone", http://lifehacker.com/5342237/five-great-reasons-to-root-your-android-phone.
6. Kisung Lee and Youjip Won. Smart Layers and Dumb Result: IO Characterization of an Android-based Smartphone. In EMSOFT 2012: In Proc. of International Conference on Embedded Software, Oct. 7-12 2012.
7. S. Morrow, "Rooting Explained + Top 5 Benefits of Your Android Phone", http://www.androidpolice.com/2010/04/15/rooting-explained-top-5-benefits-of-rooting- your-android-phone/, (2010).
8. V. Kamboj, H. Gupta, "Mobile Operating Systems", International Journal of Engineering Innovation & Research, Vol. 1, Issue 2, pp. 115-120, 2012.

IMPACT OF PROMOTIONAL ACTIVITIES ON CONSUMER'S BEHAVIOUR AT SHOPPING MALLS WITH SPECIAL REFERENCE TO CHENNAI

DR. B. N. SHANTHINI
ASST. PROFESSOR
DEPARTMENT OF COMMERCE (CA)
VELLALAR COLLEGE FOR WOMEN (AUTONOMOUS)
ERODE

ABSTRACT

The field of sales promotion or promotional activities are given due importance and large budgets are allocated for its use. Understanding how consumers respond to promotions is very vital in developing effective strategies for sales promotion. A shopping mall is a building or set of buildings which contain retail units with interconnected walkways enabling the customers to move from one unit or another. In India, there are three categories of malls- Value malls, Value cum-lifestyle malls and Lifestyle malls. Shopping malls are operating in an increasingly competitive environment characterized by over capacity and declining customers where the promotional activities of the mall are increasingly being used to differentiate the malls through image communication and stimulate merchandise purchase. This paper has been drawn up with the objective of identifying and analyzing the promotional offers offered by the malls to attract more customers and other key factors which influence consumer while deciding to visit a particular mall.

KEYWORDS

Customer, Promotional offers, Sales promotion, Shopping malls, Strategies.

INTRODUCTION

In the present competitive world, if any business organization has to survive it needs to keep an eye on various forces operating in the market. Moreover competitors constantly try to win others. In this scenario, every business organization needs to monitor the changes taking place in the market place so that they are not trapped. Market research is an efficiency tool in the hands of the marketer that helps them to bring changes in the business. The concept of shopping has been altered with the advent of shopping malls. Consumers now-a-days prefer comfort and suitability which the shopping malls cater to, and so this type of shopping has been popular throughout the world. The inclusion of amenities like restaurants, multiplexes, and car parks attract more and more crowds to shopping malls, that are considered hangout zones. In India, the emergence of shopping malls has mostly altered the lifestyle of the consumers. With the growth in income, changing attitudes, and also the demographic patters favour the emergence of shopping malls. The Industry is rated as the fifth most attractive emerging retail market. With the organized retail segment growing at the rate of 25-30% per annum revenues from the sector is US $ 400 billion in 2014.

REVIEW OF LITERATURE

TAUBER (1972), in his study " **A study on the personal shopping motivations**" deals with the need for social experiences outside the home, communication with others having the same interest, peer group attraction, status and authority and pleasure of bargaining were included in the category of social shopping motivations.

KOTLER (1983), in his study "**Sales promotion consists of a diverse collection of incentive tools, mostly short-term designed to stimulate quicker and / or greater purchase of a particular product by consumers or the trade**" it deals with giving the users as free coupons upon buying every products get considerable discount on the next purchase with certainly bind your consumers with your products and it will switch on a new brand, even if it being highly competitive.

LEE ADLER (1983), made a study on "**A study on the influence of the online promotions**", now-a-days, one can't ignore the issue of increasingly sales promotional activities online. The valuable component of dot.com operation, coupons and other type of promotions have important role in driving traffic to the website and in overall company's operations.

LEVY (1983), in his study "**Sales promotion is the direct inducement or incentive to the sales force, the distributor or the consumer with the primary objective of creating and immediate sale**" deals with all marketing activities that attempt to stimulate to quick buyer action or attempt to promote immediate sales of product.

GUY (1990), in his paper on " **Consumer satisfaction towards shopping malls**" that the consumers today have a growing choice of shopping destination which includes freestanding, stores, retail parks, malls, specialty and festival centre and ancillary retailing as well as increasing variety of home shopping by mail and television.

HARDY (1992), in his study "**Consumer satisfaction towards shopping centre**" since the early 1992 the need for effective marketing of shopping centre has been brought into sharp focus. However many studies have pointed out the noticeable lack of marketing orientation among shopping centres.

STATEMENT OF THE PROBLEM

In this competitive world, retailing industry has more brands in the battlefield facing stiff competition in every segments targeted. Every brand is facing stiff competition to retain in the market.

- What is the socio-economic characteristic of the consumers?
- Is the communication and guidance are available properly in the shopping malls?
- Is the shopping mall providing more promotional opportunity to the consumer?
- Are they suitable for all the income groups?

OBJECTIVES OF THE STUDY

1. To study the motives of people visiting different shopping malls.
2. To study the impact of promotional strategies on consumer buying behaviour.
3. To study the factors influencing the customer to purchase the products in shopping malls.

METHODOLOGY

The present study is a descriptive study undertaken in Chennai city. This study is based on the data collected in form of structured questionnaire from 150 respondents. The data collected were analysed by using SPSS package. The statistical tools used were percentage method and chi square test. The hypothesis testing was done using chi square analysis at 5% level of significance.

DATA ANALYSIS AND INTERPRETATION

The respondents were categorised on the basis of age, gender, occupation and the monthly income, the results of which are as follows:

TABLE 1: AGE DISTRIBUTION

Age (in years)	Frequency	Percentage
Below 20 years	32	21.33
20-30 years	63	42
30-40 years	30	20
Above 40 years	25	16.67
Total	150	100

Source: Primary data

It is observed from the table that majority 42% of the respondents are in the age group of 20-30 years.

TABLE 2: GENDER DISTRIBUTION

Gender	Frequency	Percentage
Male	54	36
Female	96	64
Total	150	100

Source: Primary data

It is observed that majority 64% of the respondents are female.

TABLE 3: OCCUPATION DISTRIBUTION

Occupation	Frequency	Percentage
Business	38	25.33
Profession	30	20
Home maker	21	14
Employee	29	19.33
Others	32	21.34
Total	150	100

Source: Primary data

The table depicts that majority 25.33% of the respondents are business people, 20% are Professionals.

TABLE 4: MONTHLY INCOME DISTRIBUTION

Monthly income	Frequency	Percentage
Below Rs.10000	30	20
Rs.10000-Rs.20000	34	22.67
Rs.20000-Rs.30000	41	27.33
Above Rs.30000	45	30
Total	150	100

Source: Primary data

The table shows that 30% of the respondents were in the monthly income group of Rs.30000 and above.

For the purpose of the study, the respondents opinion about the source of information, reason for preferring the shopping malls, awareness of the promotional activities at the shopping malls, impressing activities in the shopping malls, opinion about the frequency of visiting the shopping malls, opinion about the purpose of purchasing at shopping malls, products purchased most at the shopping malls, price of products at shopping malls and opinion about the facilities expected at shopping malls were analysed.

TABLE 5: SOURCES OF INFORMATION

Source of information	No. of respondents	Percentage
Friends and relatives	37	24.67
Newspapers	26	17.33
Advertisement	29	19.33
Magazines	13	8.67
Internet	21	14
Flux banners	24	16
Total	150	100

The table shows that majority 24.67% of the respondents got the information about the shopping malls from their friends and relatives, 19.33% through advertisement and the least 8.67% through magazines.

TABLE 6: REASON FOR PREFERRING SHOPPING MALLS

Preference for shopping malls	No. of respondents	Percentage
Availability of adequate stock	35	23.33
Offers and discounts	44	29.33
Convenience of location and timing	33	22
Variety of products	38	25.34
Total	150	100

Majority 29.33% of the respondents are preferring shopping malls due to availability of adequate offers and discounts, 23.33% due to availability of adequate stock, 25.34% of the respondents prefer shopping malls due to availability of variety of products and remaining 22% due to convenience of location and timing.

TABLE 7: AWARENESS ABOUT THE PROMOTIONAL ACTIVITIES AT THE SHOPPING MALLS

Awareness	No. of respondents	Percentage
Yes	118	78.67
No	32	21.33
Total	150	100

Majority 78.69% of the respondents are aware about the promotional activities at the shopping malls.

TABLE 8: IMPRESSING ACTIVITIES IN THE SHOPPING MALLS

Activities	No. of respondents	Percentage
Fun games	34	22.67
Sounds and lightening	29	19.33
Reality shows	28	18.67
Fashion shows	20	13.33
Media advertisement	39	26
Total	150	100

Source: Primary data

Majority 22.67% of the respondents were impressed by the fun games followed by sounds and lightening 19.33%

TABLE 9: FREQUENCY OF VISITING THE SHOPPING MALLS

Frequency of visit	No. of respondents	Percentage
Once in a week	26	17.33
Twice in a week	57	38
Once in every 15 days	28	18.67
Once in a month	39	26
Total	150	100

Source: Primary data

The table shows that majority 38% of the respondent visit the mall twice in a week and 17.33% of the respondent visit the mall once in a week.

TABLE 10: PURPOSE OF PURCHASE

Purpose of purchase	No. of respondents	Percentage
Personal usage/consumption	86	57.33%
Gifts	64	42.67%

Source: Primary data

The table represents that 57.33% of the respondents were purchasing from shopping malls for personal use and remaining 42.67% were purchasing for offering gifts.

TABLE11: PRODUCTS MOSTLY PURCHASED AT SHOPPING MALL

Products	No. of respondents	Percentage
Grocery	27	18
Clothes	50	33.33
Electronic items	28	18.67
Cosmetics	25	16.67
Others	20	13.33
Total	150	100

Source: Primary data

The table represents that majority 33.33% of the respondents mostly purchase clothes at shopping malls followed by 18.67% electronics items.

FINDINGS

Null Hypothesis: There is no significant relationship between gender and the level of satisfaction with regard to price of products in the Shopping mall.
The calculated value is 2.9829 at 5% level of significance with degree of freedom 2. Since the calculated value is less than table value 5.991, the null hypothesis is accepted. Hence there is no significant relationship between gender and level of satisfaction with regard to price of products in the shopping malls.
Null Hypothesis: There is no significant relationship between gender and the level of satisfaction with regard to quality of products in the shopping malls.
The calculated value is 3.5 at 5% level of significance with degree of freedom 6. Since the calculated value is less than table value 12.6, the null hypothesis is accepted. Hence there is no significant relationship between gender and level of satisfaction with regard to quality of products in the shopping malls.
Null Hypothesis: There is no significant relationship between facility and the level of satisfaction with regard to Promotional offers.
The calculated value is 7.195 at 5% level of significance with degree of freedom 6. Since the calculated value is less than table value 9.49, the null hypothesis is accepted. Hence there is no significant relationship between facility and level of satisfaction with regard to Promotional offers.

LIMITATIONS

- This study is restricted to Chennai city only. Therefore the results may not be applicable to other areas.
- Only 150 respondents were selected for the study. So the result may vary if more respondents are included.
- The findings of the study depend upon the responses given by the sample respondents.

CONCLUSION

After looking into the above data, the researcher has come to a conclusion that presently there are considerable increases of shopping malls in all the metros cities, small towns and large section of middle class, upper class people are shopping for the following reasons: Customers convenience for shopping, items from food to clothing, grocery to electronics are available under one roof, better environment and improved customer service, competitive price with seasonal discount, various gift scheme, various options for choosing brands, scope of promoting sales and enhancing brand image, availability of ample space for car parking. These shopping malls use the promotional sales as a tool to lead the first time users by offering price reduction, sales coupon and guarantees for increasing the repeated purchase from the existing and new customers.

REFERENCES

1. Kumar A. and Meenakshi, N. (2011) Marketing Management (2nd ed.), New Delhi, Vikas Publishing House Pvt. Ltd.
2. Levy, M., & Weil, B. A. (2008). Retailing Management. McGraw-Hill.
3. Lincoin, K., & Thomasson, L. (2008). How to Succeed at Retail:Winning Case Studies and Strategies for Retailing and Brands. Kogan Page Limited.
4. Lovelock, C., & Wirtz. J. (2010). Services Marketing: People,Technology, Strategy. Prentice Hall.
5. Malhotra, N. K. (2005). Marketing Research: An Applied Orientation Person.
6. Nair, S. (2014), Consumer Behaviour in Indian Perspective (2nd ed.), Mumbai, Himalaya Publishing House.
7. Nargundkar, R. (2008). Services Marketing: Text and Cases. Tata McGraw-Hill.
8. Ogden, J., & Ogden, D. T. (2005). Integrated Retail Management Biztanta.
9. Pradhan, S. (2004). Retailing Management. Tata McGrew-Hill.
10. Rampal, M. K., & Guta, S. L. (2000). Services Marketing. Galgotia.

HOME AUTOMATION AND SECURITY SYSTEM USING ANDROID ADK

N. SENDHIL KUMAR
HEAD
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

D. CHITTEMMA YADAV
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

D. R. NANDINI
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Android ADK. The configuration is in light of a standalone implanted framework board Android ADK(Accessory Development Kit) at home. Home machines are associated with the ADK and correspondence is secured between the ADK and Android cell phone or tablet. The home apparatuses are joined with the data/yield ports of the installed framework board and their status is gone to the ADK. We would build up a validation to the Today we are living in 21st century where mechanization is assuming vital part in human life. Home mechanization permits us to control family unit apparatuses like light, entryway, fan, AC and so on. It additionally gives home security and crisis framework to be actuated. Home robotization alludes to lessen human endeavors as well as vitality proficiency and efficient. The principle goal of home robotization and security is to help crippled and old matured individuals which will empower them to control home apparatuses and alarm them in basic circumstances. This paper put advances the configuration of home robotization and security framework utilizing framework for approved individual to get to home apparatuses. The gadget with ease and versatile to less adjustment to the center is much essential. It introduces the outline and execution of computerization framework that can screen and control home apparatuses by means of android telephone or tablet.

KEYWORDS

Home Automation and Security, Arduino, Embedded Systems, Android ADK, Android phone, Tablet.

I. INTRODUCTION

Home mechanization is robotization of the home, housework or family unit movement. Home computerization may incorporate incorporated control of lighting, HVAC (warming, ventilation and cooling), apparatuses, and different frameworks, to give enhanced comfort, solace, vitality effectiveness and security. The idea of home mechanization has been around for quite a while and items have been available for a considerable length of time, however nobody arrangement has gotten through to the standard yet. Home mechanization for the elderly and crippled can give expanded personal satisfaction to persons who may somehow oblige parental figures or institutional consideration. It can likewise give a remote interface to home machines or the mechanization framework itself, through phone line, remote transmission or the web, to give control and observing by means of a PDA or web program. This paper will depict the methodology which we are executing to control different home machines with Android advanced mobile phone.

II. LITERATURE SURVEY

According to our review right now there exists no framework at less expensive rates. Different frameworks are difficult to introduce, hard to utilize and keep up. Current frameworks are for the most part restrictive and shut, not extremely adjustable by the end client.

N. Sriskanthan [1] clarified the model for home mechanization utilizing bluetooth through PC. Anyway shockingly the framework needs to bolster portable innovation.

Muhammad Izhar Ramli [2] composed a model electrical gadget control framework utilizing Web. They likewise set the server with auto restart if the server condition is as of now down.

Hasan [5] has added to a phone and PIC remote controlled gadget for controlling the gadgets pin check calculation has been presented where it was with link arrange yet not remote correspondence.

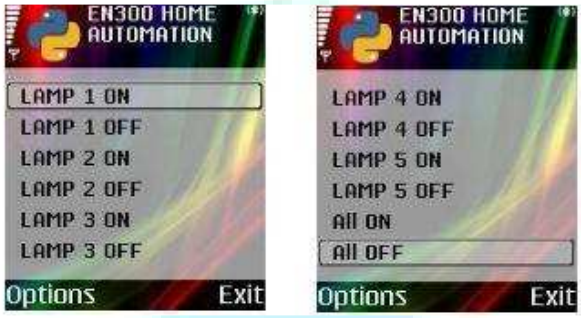
Pradeep G [4] proposed home robotization framework by utilizing bluetooth which spares part of force and time utilizing system to spare the preloaded rundown by not making it to setup association all the time when needed.

Al-Ali and Al-Rousan [3] displayed a configuration and execution of a Java-based mechanization framework through World Wide Web. It had a standalone installed framework board incorporated into a PC-based server at home.

Amul Jadhav [6] added to an application in an all inclusive XML group which can be effortlessly ported to whatever other cell phones as opposed to focusing on a solitary stage.

FIGURE 1: HOME AUTOMATION SYSTEM BLOCK DIAGRAM BY R. PIYARE [8]

FIGURE 2: CELL PHONE GUI FOR CONTROLLING THE HOME APPLIANCES BY R PIYARE [8]



R.Piyare [8] have presented configuration and usage of a minimal effort, adaptable and remote answer for the home mechanization.
Jitendra R. [7] demonstrated that with the ZigBee organize how to wipe out the difficulty of wiring if there should be an occurrence of wired mechanization. There is likewise extensive measure of force sparing conceivable, working extent is more than Bluetooth.
Google and Microsoft have as of late entered the home robotization space. At 2011 I/O gathering, [9] Google reported Android@Home. Google' s fi rst standard for Android gadgets to speak with outside equipment. The Android Open Accessory Standard and the Accessory Development Kit (ADK) is the key for speaking with equipment and building outer frill for Android gadgets. Android powers countless cell phones in more than 190 nations around the globe. [10] It's the biggest introduced base of any portable stage and developing quick consistently another million clients.
Microsoft will be likewise working on a venture called HomeOS, [11] a working framework for the home.

III. IMPLEMENTATION

A. ANDROID

For this home computerization and security framework we are focusing on Android stage since it has tremendous market and open source. Android is a product stack for cell phones that incorporates an working framework, middleware and key applications. The Android OS will be construct with respect to Linux. Android Applications are made in a Java-like dialect running on a virtual machine call ed " Dalvik' made by Google. The Android SDK gives the apparatuses and APIs important to start creating applications on the Android stage utilizing the Java programming dialect. Embellishment mode will be a highlight of Android OS since form 2.3.4 Gingerbread and 3.1 Honeycomb or more.

B. SOFTWARE DESIGN

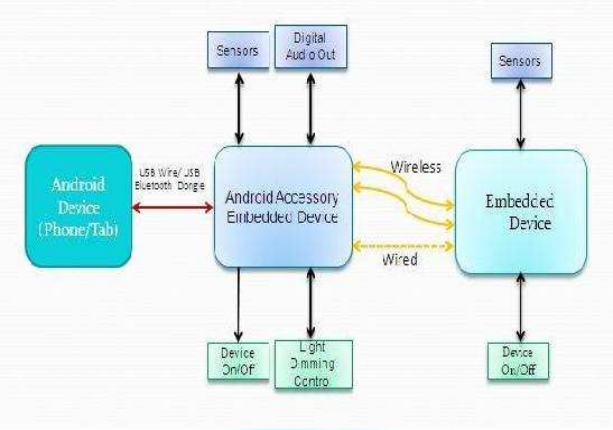
As examined before we will be creating Android application. The application comprises of primary capacity like Light controlling, Door controlling, Smoke discovery and Temperature sensing. At the point when the application begins client is initially confirmed, if client is approved he will be explored to principle screen. The primary screen has a rundown of all capacities among which client can choose any one capacity which he need to control. In the wake of selecting a capacity he would have the capacity to see a current status of a specific gadget. On the off chance that client wishes, he can empower or handicap planned gadget.

C. ANDROID ADK

ADK remains for Accessory Development Kit. Android extra is a physical embellishment that can be joined to your Android gadget. [12] These specific gadgets perform particular activities. For USB assistants to be upheld on a specific gadget, there must be backing for the adornment mode, a unique means of interfacing over the USB port. This permits information exchange in the middle of gadgets and outside peripherals.
The framework is sufficiently keen to enact caution when smoke is recognized or it is modified to auto on/off lights amid late night hours. On the off chance that room temperature goes high or low it can consequently conform fan/AC according to the temperature. It has voice route which is particularly advantageous to visually impaired individuals.

FIGURE 3: ARDUINO MEGA ADK

FIGURE 4: BLOCK DIAGRAM OF HOME AUTOMATION AND SECURITY SYSTEM USING ANDROID ADK



The Android Open Accessory Development Kit (ADK) is a reference usage of an Android Open Accessory, in view of the Arduino [15] open source hardware prototyping stage. The frill's equipment outline documents are given as a component of the pack to help equipment manufacturers begin building their own adornments.

The Arduino ADK [15] is a microcontroller board in light of the ATmega2560. It has a USB host interface to unite with Android based telephones, in view of the MAX3421e IC. The principle equipment and programming parts of the ADK incorporate " Arduino Mega ADK" , which was planned to work wi th Android. The " Ardui no Mega ADK" board is a deri vative of the " Arduino Mega 2560" . The host chip permits any USB gadget to unite to the Arduino which we will later actualize as an Android USB embellishment. The ADK board gives enter and yield sticks that you can actualize through the use of connections called "shields." With an Android gadget and the " Mega ADK" , you can utilize whatever sensors and actuators you require to make your own extras. This may incorporate a LED yields, and temperature and light sensors.

D. ANDROID OPEN ACCESSORY PROTOCOL

Android Open Accessory [13] backing permits outside USB equipment (an Android USB frill) to interface with an Android-fueled gadget in a unique adornment mode. At the point when an Android-controlled gadget is in extra mode, the associated frill goes about as the USB host (controls the transport and lists gadgets) and the Android-fueled gadget acts in the USB adornment part. Android Open Accessory Protocol, [14] permits to recognize Android-fueled gadgets that bolster adornment mode. Extra mode is eventually subject to the gadget's equipment and not all gadgets bolster adornment mode.

Android Open Accessory backing is incorporated in Android 3.1 (API Level 12) and higher, and bolstered through an Add- On Library in Android 2.3.4 (API Level 10) and higher. Android 4.1 and higher has support for sound yield over a USB association or Bluetooth An Android USB frill must hold fast to Android Accessory Protocol, which characterizes how an adornment identifies and sets up correspondence with an Android- fueled gadget. [14] as a rule, an embellishment ought to do the accompanying steps:

1. Sit tight for and recognize joined gadgets
2. Focus the gadget's embellishment mode support
3. Endeavor to begin the gadget in embellishment mode if necessary
4. Create correspondence with the gadget on the off chance that it underpins the Android embellishment convention.

The Android Open Accessory Protocol 2.0 [16] includes two new highlights: sound yield (from the Android gadget to the embellishment) and backing for the frill going about as one or more Human Interface Devices (HID) to the Android gadget.

IV. BLOCK DIAGRAM

Android Device - It is the gadget through which application communicates with sensors.

USB Connector - It is the equipment port in the unit through which the USB gadget is joined to the inserted pack.

Android Accessory Development Kit(ADK) - ADK permits Android Phone to go about as USB Device where as the " Arduino- Mega2560 ADK" wi ll act as USB Host. This permits correspondence between Android Powered Devices (like telephone, tablet) and outside Hardware like modern controls.

Installed Device - It comprises of individual inserted packs alongside separate sensors.

V. APPLICATIONS

Taking after are the utilizations of Home Automation and Security System

- Medical caution/ teleassistance.
- Precise and safe visually impaired control.
- Detection of flame, gas breaks and water spills.
- Smoke locator can recognize a fire or smoke condition, bringing on all lights in the house to squint to alarm any individual of the house to the conceivable crisis.
- The framework can call the property holder on their cell telephone to alarm them, or call the fire division or caution checking organization.
- as far as lighting control, it is conceivable to spare vitality when hours of squandered vitality in both private and business applications via auto on/off light at evening in all real city office structures, say after 10pm.
- Control and joining of security frameworks furthermore the potential for focal locking of all border entryways and windows.
- Security cams can be controlled, permitting the client to watch movement around a house or business right from a Monitor or touch board.
- Security frameworks can incorporate movement sensors that will identify any sort of unapproved development and advise the client through the security framework or by means of cell.
- An radio framework permits correspondence by means of an amplifier and noisy speaker .

VI. FUTURE WORK

Taking a gander at the current circumstance we can construct cross stage framework that can be conveyed on different stages like iOS, Windows. Confinement to control just a few gadgets can be evacuated by expanding mechanization of all other home machines. Security cams can be controlled, permitting the client to watch movement around a house or business. Security frameworks can incorporate movement sensors that will distinguish any sort of unapproved development and tell the client. Extent of this venture can be extended to numerous ranges by not limiting to just home. It will be adaptable to bolster different wired and in addition remote advances like Bluetooth, Zigbee, Wi-Fi, World Wide Web.

VII. CONCLUSION

This is a continuous venture. Our prime target is to aid impaired/old matured individuals. This paper gives fundamental thought of how to control different home machines and give a security utilizing Android telephone/tab. This venture is in view of Android and Arduino stage both of which are FOSS(Free Open Source Software). So the general execution expense is exceptionally shabby and it will be reasonable by a regular individual. Looking at the current situation we have picked Android stage so that the majority of the individuals can get advantage.

The outline comprises of Android telephone with home mechanization application, Arduino Mega ADK. Client can associate with the android telephone and send control sign to the Arduino ADK which thusly will control other implanted gadgets/sensors. We have talked about a straightforward model in this paper however in future it can be extended to numerous different regions.

VIII. ACKNOWLEDGMENT

We recognize the endeavors and diligent work by the specialists who have contributed towards advancement of the distinctive home mechanization frameworks. We additionally recognize the endeavors of the analysts of the diary for the proposals and alterations to enhance the nature of the paper and to help set up the cam prepared duplicate of our paper.

REFERENCES

1. N. Sriskanthan and Tan Karand. " Bluetooth Based Home Automation System". *Journal of Microprocessors and Microsystems*, Vol. 26, pp.281-289, 2002.
2. Muhammad IzharRamli, Mohd Helmy Abd Wahab, Nabihah, " TOWARDS SM ART HOM E: CONTROL ELECTRICAL DEVICES ONLINE", Nornabihah Ahmad International Conference on Science and Technology: Application in Industry and Education (2006)
3. Al-Ali, Member, IEEE & M. AL-Rousan," Java-Based Home Automation System R." IEEE Transactions on Consumer Electronics, Vol. 50, No. 2, MAY 2004
4. Pradeep.G, B.Santhi Chandra, M.Venkateswarao,"Ad-Hoc Low Powered 802.15.1 Protocol Based Automation System for Residence using M obile Devices", Dept.of ECE, KLUniversity, Vijayawada, Andhra Pradesh, India IJCST Vo l. 2, SP 1, December 2011
5. E. Yavuz, B. Hasan, I. Serkan and K. Duygu. " Safe and Secure PIC Based Remote Control Application for Intelligent Home" . *International Journal of Computer Science and Network Security*, Vol. 7, No. 5, May 2007.
6. Amul Jadhav, S. Anand, Nilesh Dhangare, K.S. Wagh "Universal Mobile Application Development (UMAD) On Home Automation" Marathwada Mitra Mandal's Institute of Technology, University of Pune, India Network and Complex Systems
7. Rana, Jitendra Rajendra and Pawar, Sunil N., Zigbee Based Home Automation (April 10, 2010). Available at SSRN: http://ssrn.com/abstract=1587245 or http://dx.doi.org/10.2139/ssrn.1587245
8. R.Piyare, M.Tazil" Bluetooth Based Home Automation System Using Cell Phone", 2011 IEEE 15th International Symposium on Consumer Electronics
9. http://googleblog.blogspot.in/2011/05/android-momentum-mobile-andmore-at.html
10. http://developer.android.com/about/index.html
11. http://research.microsoft.com/en-us/projects/homeos/
12. http://source.android.com/tech/accessories/index.html
13. http://developer.android.com/guide/topics/connectivity/usb/accessory.ht ml#manifest
14. http://source.android.com/tech/accessories/aoap/aoa.html
15. http://arduino.cc/en/Main/ArduinoBoardADK

ANDROID SECURITY

T RAMATHULASI
ASST. PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

M. ARCHANA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

M.RAMA
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Android Security has been burning spot recently in both intellectual search and public concern due to numerous instances of security attacks and privacy leakage on android platform. The marketing for smart phones has been developing in the past few years. There are now more than 400,000 applications on the Android market. Over that 10 billion Android applications have been downloaded from the Android market. Due to the popularity of Android, there are now a huge number of malicious vendors targeting the android platform. Many of the honest end users are being successfully hacked on a regular basis. Based on this work Android security has been built upon a permission based on the mechanism which restricts accesses of third-party android applications to critical resources on an Android device which greatly mitigates the malicious attacks targeting the Android market. Our security solution has advantage of the fact that each application in the android platform is assigned a unique user id (UID). Our explanation stores the reputation of Android applications in an anti-malware providers' cloud (AM Cloud). The experimentalresults witness that the proposed model could well identify the reputation index of a given application and hence it's potential of being risky or not. Finally we propose several methods to further mitigate the risk of Android Security.

KEYWORDS

Smart phones, Android OS, Reputation based security, Inter Process Communication.

1. INTRODUCTION

As the development of technology, the world's mobile phone also has developed quite rapidly. Mobile phone previously could only use to phone and send SMS but now can be used for various purposed in accordance with the needs of the users Rapid advances in mobile and wireless technologies have led to the development of smart, user preference oriented and context-aware devices. In the near expectations, wireless sensors will be fully included in clothing, appliances, and vehicles and in every place we can imagine. Permission-Based and Access control lists (ACLs) security models allow administrators and operating systems to restrict actions on specific resources. In put into practice, designing and configuring Access control lists (ACLs) particularly those with a huge number of configuration parameters is a complicated task. More specifically, reaching a balance between the detailed lucidity of permissions and the usability of the system is not trivial, especially when a system will be used by experts and novices alike. One of the main problems with Permission models and Access control lists in general is that they are classically not designed by the users who will ultimately use the system, but rather by administrators or developers who may not always for see all possible use cases. While some dispute that the problem with these permission- based systems is that they are not designed with usability in mind , we believe that in addition to the usability concerns, there do not have a clear understanding of how these systems are used in practice, leading security experts to blindly attempt to make them better without knowing where to start. While there are many broadly deployed systems which use permissions, we focus on the pragmatic analysis of the permission model included in Android Operating System. Android is a new comer to the smart phone industry and in just a few years of survival has manage to obtain significant media attention, market share, and developer base. Android uses ACLs extensively to mediate inter-process communication (IPC) and to control access to special functionality on the device (e.g., GPS receiver, text messages, vibrator, etc.). Android developers have to request permission to use these special features in a standard format which is parsed at install time. The OS is then responsible for allowing or denying use of specific resources at run time. The permission model used in Android has many advantages and can be effective in preventing malware while also informing users what kind of applications are capable of doing once installed. The main objectives of our experimental analysis are: (1) To investigate how the permission-based system in Android is used in practice (e.g., whether the design expectations meet the real-world usage characteristics and (2) To identify the strengths and limitations of the current implementation. We believe such analysis can reveal interesting usage patterns, particularly when the permission-based system is being used by a wide spectrum of users with varying degrees of expertise.

SYSTEM ANALYSIS

Today, the mobile phone has been developed inconceivable. The mobile phone is sophisticated enough at this time, users can easily tenacity some of the things that is used to only be done through a computer such as email or check to see stock prices. Although not all things can be done via mobile phone, mobile phone seemed to be the major needs and become a trend among the general public things like this that affects current mobility. With the high mobility that exists today, the lose case is something very usual case of lose often occurs due to user negligence in place their mobile phone or also occurs due to user will fell confused when their mobile phone is lost because some important data such as contact or even personal photos stored on it. Such data can be misused by irresponsible parties. Therefore it takes a security application that prevents data access time in case of loss. In addition to that preventing data access by an unauthorized person and find the location of current mobile phone will lost the application must also be able to perform the deletion of data on a lost mobile phone. These data deletion facility should be added to the application of safeguards intended to provide additional security to the owner of the mobile phone during a loss.

2. CONDITIONS

In this basic form ,Access control systems have existed for a long time and security system is based on access control lists which allows the subject to perform an action (e.g., read, write, run) on an object (e.g., file) only if the subject has been assign to the available permissions. Permissions are usually defined in front of time by an administrator or the owner. Basic file system permissions on POSIX-compliant systems are the traditional example of ACL-based security since objects. In this case, files can be read, written or executed either by the owner of the file, users in the same group as the owner, and/or everyone else. High sophisticated ACL-based systems allow the specification of a complex policy to control more parameters of how an object can be access. Permission-based security term can be used to refer the subset of ACL-based systems in which the action cannot change there exist only one possible action to accept or deny an object). This will be similar to multiple ACLs, where each ACL can access to one action. We noticed that dropping the allowable actions to one does not necessarily make the system easier to understand or configure. For example, In most of the Android permission model, developers can implement finer level granularity by defining separate access for read and write actions.

2.1 *PERMISSION-BASED PROTECTION EXAMPLES*

Google's Android OS is an example of a Permission-based security model which is used for mobile devices. Android requires that developers need to have permissions in a manifest list of permissions which allows the user and must accept former to installing an application.

To restrict access to advanced or dangerous situations Android uses this permission model on the device. Based on the list of permissions added by the developer, the user can decides whether to allow an application to be installed or not.

Similar to Android OS, the Google Chrome web browser uses a permission-based architecture in its extension system. Extension developers create a manifest where specific functionality (e.g., reading bookmarks, opening tabs, contacting specific domains) required by the extension can be requested. The manifest is read at extension install time to better inform the user of what the extension is capable of doing, and reduce the privileges that extensions are given [10]. In contrast, Firefox extensions, which do not have this permission architecture, run all extension code with the same OS-level privileges as the browser itself. A third example of a currently deployed permission- based architecture is the Blackberry platform from Research in Motion (RIM). Blackberry applications written in Java must be cryptographically signed in order to gain access to advanced functionality (known as Blackberry APIs with controlled access) such as reading phone logs, making phone calls or modifying system settings [3].

2.2 *ASSOCIATED EFFORT*

The design and implementation of a framework is to detect potentially malicious applications based on permissions requested by Android applications. The framework reads the declared permissions of an application at install time and compares it against a set of rules deemed to represent dangerous behavior. For example, an application that requests access to reading phone state, record audio from the microphone, and access to the Internet could send recorded phone conversations to a remote location. The framework enables applications that don't declare (known) dangerous permission combinations to be installed automatically, and the authorization to install applications that do to the user. Present a fine-grained access control policy infrastructure for protecting applications. Their proposal extends the current Android permission model by allowing permission statements to express more detail. For example, rather than simply allowing an application to send IPC messages to another based on permission labels, context can be added to specify requirements for configurations or software versions. The authors highlight that there are real-world use cases for a more complex policy language, particularly because untrusted third-party applications frequently interact on Android.

3. PROPOSED RESOLUTION

As part of a solution to the above identified pitfalls in the android security model, we propose a reputation based security trust model to evaluate and validate the applications prior to installation. We have also analyzed the consequences of a malicious application that has managed to get installed with the full consent of the end user. The Internet is full of genuine and malicious applications. An Android mobile owner can download different applications with varying reputation ratings. In this model, it is proposed that after downloading and before installing, the mobile device asks the AM Cloud for the reputation of the downloaded application.

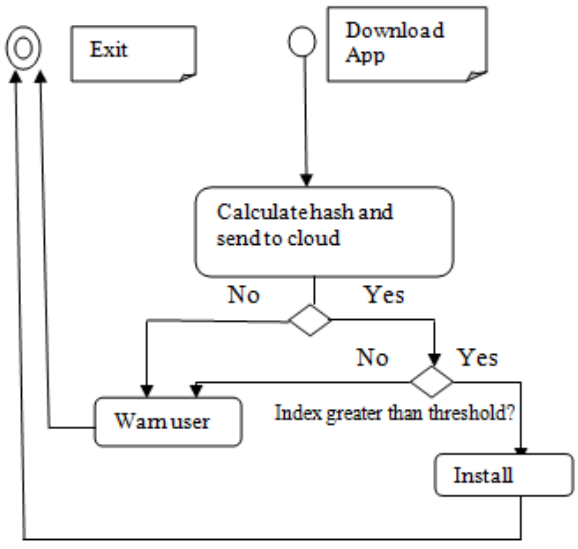


Figure-1: overview of the proposed protocol

4. EXPERIMENTS

Regarding just the applications which have not yet developed a strong reputation, we need to analyse those applications. To analyse the behaviour of an Android application, it is easiest way to start with analysing the set of permissions that the application has set in the Android application package file which includes all of the application's code, resources, assets, and manifest file. To do this, we have experimented with a reputation based security model for Android applications. A second experiment was also done to analyze how a malicious application could track a mobile owner's location and report it to a third party. The results were achieved using two experiments.

4.1. *EXPERIMENT-1*

One solution can be achieved by anti-malware vendors which is used to perform analysis of the application on the Android platform. However the Android is low on resources, such as performance, battery life and main memory. So it makes more intellect to perform the analysis in the AM Cloud. To overcome these issues, another solution which has been used by anti-malware providers is to upload the entire application for analysis (for each user). For our solution, we will minimize the uploading of applications to the AM Cloud. I.e., we do not want two users, with the same exact application, to both upload the same application. Our approach to minimize the uploading of applications now follows.

4.2. *EXPERIMENT-2*

In this second experiment, we have developed two applications namely Location Tracker, The Location Tracker application has ACCESS_FINE_LOCATION, ACCESS_MOCK_ LOCATION, and ACCESS_COARSE_LOCATION permissions in the user permission manifest file of the application. The manifest file declares which permissions the application must have in order to access protected parts of the API and interact with other applications [18]. It also declares the permissions that others are required to have in order to interact with the application's components [18]. The Location Tracker application implements a location. Listener class that returns the latitude and longitude of the present location by consulting the Location Manager, which provides access to the system location services. We can use the latitude and longitude to locate the associated geographic place such as the street address, hotel, and zip codes.

5. FURTHER ARGUMENT

Designing a permission-based system is a challenging task because system designers must anticipate what usage will be given to the permissions defined in their system. The analysis in this paper has helped to identify developer usage patterns in a real-world dataset of top Android applications. Additionally, there is a constant struggle to make the system highly configurable under different use-cases while maintaining a low level of complexity. Understanding how the permission model is used in practice can help in making modifications to improve currently deployed permission systems. Furthermore, our analysis shows correlations between several of the infrequently used permissions. We note that having finer-grained permissions in a permission- based system enables users to have detailed control over what actions are allowed to take place. Whether it is beneficial to provide finer granularity will depend on many factors within a particular environment, as it increases complexity and thus may have, for example, usability impacts on designers and end-users. In the case of Android, having ‗too many' permissions impacts both developers and endusers. Developers must understand which permissions are needed to perform certain actions; determining this is often non- trivial, even for ‗experts'. While some enthusiastic developers might take the time to learn what each of the 110 or more permissions do and request them appropriately when needed, other developers might choose to simply over-request functionality to make sure their application works.

5.1. *FEASIBLE ENHANCEMENTS TO ANDROID*

The Android permission model does not currently make use of the implied hierarchy in its namespace. For example, SEND_SMS and WRITE_SMS are two independent permission labels, instead of being grouped, for instance, under SMS. Android includes an optional logical permission grouping that is used for displaying permissions with more understandable names (e.g., one of the groupings reads —Services that cost you money in- stead of CALL_PHONE).

5.2. *APPLICABILITY TO OTHER PERMISSION-BASED SYSTEMS*

The attitude presented in this work has allowed us to understand how developers use the permission-based security model in Android. We believe that our methodology is applicable to explore usage trends in other permission based-based systems. A basic requirement for the methodology to work is being able to display applications and associated permissions for this representation to be possible, the set of permissions are requested by an application must be reachable. In the case of Android, the set is statically readable in a manifest file, but other systems might have different kind of implementations. Google's Chrome OS extension system uses an Android-like manifest and permissions to access functionality of advanced, which makes this system a major candidate for applying our methodology. An experimental study of a large set of third- party extensions using our SOM-based methodology could help us to identify what correlations are present in requesting permissions for opening tabs, read bookmarks, etc. This may also be useful in addressing the other security concerns highly raised in recent work.

6. CONCLUSION

We have introduced a different kinds of methodology to the security community for developing experimental analysis of permission- based security models. In particular, the Android permission model has been analysed to investigate how it is used in practice and to determine its advantages and disadvantages. The Self-Organizing Map (SOM) algorithm is engaged, which allows for a two- dimensional visualization of highly dimensional data. SOM also supports component planes analysis which can reveal interesting usage patterns. We have analysed the use of Android permissions in a real-world dataset of 1,100 applications, focusing on the top 50 application from 22 categories in the Android market. The results show that a small subset of the permissions is used very frequently where large subsets of permissions were used by very few applications. We suggest that the frequently used permissions, specifically INTERNET, do not provide sufficient expressiveness and hence may benefit from being divided into sub-categories, perhaps in a hierarchical manner. Equally, rare permissions such as the self-defined and the complementary permissions (e.g., install/ uninstall) could be distorted into a general category. Providing finer granularity for frequent permissions and combining the infrequent permissions can enhance the expressiveness of the permission model without increasing the complexity (i.e., maintaining a constant over all permission count) as a result of the additional permissions. We hope that our SOM-based methodology, including visualization, is of use to others exploring independent permission-based models.

REFERENCES

1. A.Shabtai, Y. Fledel, U. Kanonov, Y. Elovici, S. Dolev, and C. Glaser. Google Android: A Comprehensive Security Assessment. In IEEE Security & Privacy, Volume 8, Issue 2, pp. 35–44, March–April 2010.
2. Tssssss.Bläsing, L.Batyuk, A.-D. Schmidt,S.A. Camtepe and S. Albayrak.An Android Application Sandbox system for suspicious software detection. In Proceedings of 5th International Conference on Malicious and Unwanted Software (MALWARE 2010), Nancy, France, Oct. 19–20, 2010.
3. M.Ongtang, S. McLaughlin, W. Enck, and P. McDaniel. Semantically Rich Application-Centric Security in Android. In Proceedings of the Annual Computer Security Applications Conference (ACSAC '09), Austin, TX, USA, December 6–10, 2009.
4. W. ShinS. Kiyomoto, K.Fukushima, and T.anaka. TowardsFormalAnalysis of the Permission-Based Security Model for Android.

A STUDY ON IMPACT OF ADVERTISEMENT ON CONSUMER BRAND CHOICE BEHAVIOUR TOWARDS MILK (WITH SPECIAL REFERENCE TO TIRUCHENGODE REGION)

DR. R. SUBRAMANIYA BHARATHY
ASST. PROFESSOR
PERIYAR INSTITUTE OF MANAGEMENT STUDIES
PERIYAR UNIVERSITY
SALEM

N.GEETHA
RESEARCH SCHOLAR
PERIYAR INSTITUTE OF MANAGEMENT STUDIES
PERIYAR UNIVERSITY
SALEM

ABSTRACT

The purpose of this study is to explore the impact of advertisement on consumer brand choice for milk where many brands are heavily advertised. Being milk is a basic Energetic Food to all age group people irrespective of their Economic status and occupation. This analysis will give some deep knowledge about how advertising is affect consumer buying behavior in their brand choice and level of influence of advertisement on consumer purchase decision of the customers is advertisement. For this Research study data collected through structured questionnaire among 100 randomly selected consumer in and around of Tiruchengodu region. With support of statistical tool of percentage and chi-square the collected data are examined and come to conclusion about the role of advertisement in consumer brand choice behavior.

KEYWORDS
Energetic Food, brand choice, advertisement, Purchase Decision.

INTRODUCTION

The most attractive and impressive element of promotion mix is advertising. In everyday life, Consumer gets information through various sources like T.V, newspaper, mail and magazines, outdoor bill boards moving ads in buses and taxicabs etc. In this way advertisement play a major role in distributing information to the target consumer and create demand for the products. Manufactures or sellers attract or retain the consumer by the way of attractive advertisement only because advertisement serves a dominant role in creating product awareness. Hence, Advertisings is a subset of promotion mix which is one of the 4P's in the marketing mix i.e. product, price, place and promotion. As a promotional strategy, advertising serves as a foremost essential tool in creating product awareness and condition the mind of a potential consumer to take eventual purchase decision.

CONSUMER BUYING BEHAVIOUR

Consumer Buying Behavior refers to the buying behavior of the ultimate consumer. A firm needs to analyze buying behavior for studying how people buy, what they buy, when they buy and why they buy both individually and in group. It blends elements from psychology, sociology, anthropology and economics. Knowledge of consumer buying behavior helps the firms to design their marketing strategies and improve their marketing campaigns and marketing strategies to more effectively reach the consumer. Understanding of these issues helps companies to adapt strategies by taking the consumer into consideration.

OUTCOME OF ADVERTISING ON CONSUMER BUYING BEHAVIOUR

Advertising is a form of communication used to encourage or persuade an audience (viewers, readers or listeners; sometimes a specific group of people) to continue or take some new action. Most commonly, the desired result is to drive consumer behavior with respect to a commercial offering. It is designed in such a way that it creates and reinforces brand image and brand loyalty. Thus, advertising plays a very important role in forming consumer buying behavior. Advertising is usually important for triggering the first time purchase of the product

SUMMARY OF PREVIOUS STUDIES

Advertising is more than a tool for selling. It has one overriding task, to position a brand in the prospectus perception or perceptual space in relation to competitors, so as to created distinctiveness and preference. To formulate the problem scientifically, and to point out the importance of undertaking this study, it is essential to present a brief review of Researches

J. Varaprasd Reddy (2006) in his study 'Role of Advertising in Creating Brand Personality' says that brand personality being potent tool needs to be leveraged to achieve key objectives for existing & new brands. Consistency is also important, failing which dilution of brand personality or absence of it may occur. Other mix elements like distribution, pricing, promotion and packaging (apart from advertising) should support and strengthen brand personality.

Susan Chirayath (2007) says in their research 'Impact of Promotional Activities on Consumer Buying Behavior' that, FMCG Sector in India is characterized by cut throat competition, which leads to brand proliferation in various categories. In matured urban markets consumer sales promotion to differentiate one's offer is a very common practice. In fact consumers are lured by the ever increasing budget allocated to these activities. In such a scenario it is very essential to study how consumers make their choices in FMCG category where there are several brands in the consideration set of the consumer. Since the final risk being low, consumers do not mind switching from one brand to another due to sales promotion offers. Thus it becomes imperative to the marketer to learn about consumer preferences with respect to sales promotion offers, what schemes do the consumers prefer for what kinds of brands, which media they prefer to learn about the schemes, whether they prefer incentives immediately or at a later date.

Amit Kumar (2011) in his paper 'Celebrity Endorsements and its impact on consumer buying behavior' focuses on the perception of Indian consumers aboutcelebrity endorsements, the celebrity attributes likely to influence consumer purchase intentions. The practice of celebrity endorsements has proliferated overtime. Now days it has become a pervasive element of advertising industry especially in India. Celebrity endorsement business has become a multi-millionindustry in India. Marketers use celebrity endorsers to influence the purchase decision of consumers in order to increase their sales and extend their market shares. This made the author curious to explore the impact of celebrity endorsements on consumer buying behavior.

RATIONAL OF THE STUDY

This study was conducted to find the impact of advertisement on consumers' brand choice behavior with reference to milk. Advertisement is everywhere in our life like on television, radio, newspaper and billboards are common medium's through which advertisement reach to us. Advertiser and marketers are more concerned to know what are the consumer's motives and their purchasing pattern in order to use different strategies to influence their consumer brand choice behavior .The consumers are consume milk in daily routine and demand is constant so the marketer's focused heavily to judge psyche of consumers; what they like, why they like and what will be appreciable in. Advertisements of milk should concern about variety of milk and its benefit.

OBJECTIVES OF THE STUDY

In this research work has the following objectives:

- To study the impact of advertisement on consumer brand choice behavior.
- To Know which media is suitable for milk advertisement
- To examine at level advertisement support consumer in their brand choice
- To suggest recommendation for further improvement in advertisement

LIMITATIONS OF THE STUDY

- The study was confirmed in selected place only. Therefore the findings may not be true in other areas.
- The samples and time of the study was limited.
- Few respondents are not giving the proper answer
- Few respondents are reluctant to reveal their true opinion
- Finding of this study is only based on the information given by the respondents

Despite of the limitation, a sincere attempt has been made to collect and analyze the data and present the information as accurate as possible.

RESEARCH METHODOLOGY

The research design involves a series of rational decision making choices relating to decisions regarding the purpose of study, where the study will be conducted, type of the study, the extent to which the researcher manipulates and controls the study, the temporal aspect of the study(time horizon), and the level at which the data will be analyzed. In addition, decision have to be made as the type of the sample to be used(sample design), how data will be collected (data collection method), how the variables will be measured and how they will be treated.

TYPE OF RESEARCH

The type of research adopted is descriptive research.

DATA SOURCES

Both primary and secondary data are collected for the completion of this study.

PRIMARY DATA

Primary data is collected using questionnaires. These questionnaires are circulated among the general people in triuchegode region namakkal district.

SECONDARY DATA

Secondary data is collected mostly from websites, company profiles,records as well as journals**.**

❖ **SAMPLING PLAN**

Sampling unit - It includes the general public who lived in and around of Tiruchengode.

Sample size - 100

Sampling Technique - Convenience sampling method.

TOOLS FOR ANALYSIS

Data is collected with the help of questionnaires. The collected data were tabulated and analyzed with the help of simple percentage method using bar diagrams, pie charts, Chi-square method[Level of significant 5%, Degree of freedom(r-1)(c-1)].

- **Simple Percentage :** Percentage = (Value/Total Value) *100
- **Chi-square :** Chi – Square = $\chi^2 = \frac{\sum (Fo-Fe)^2}{Fe}$

ANALYSIS AND INTERPRETATION

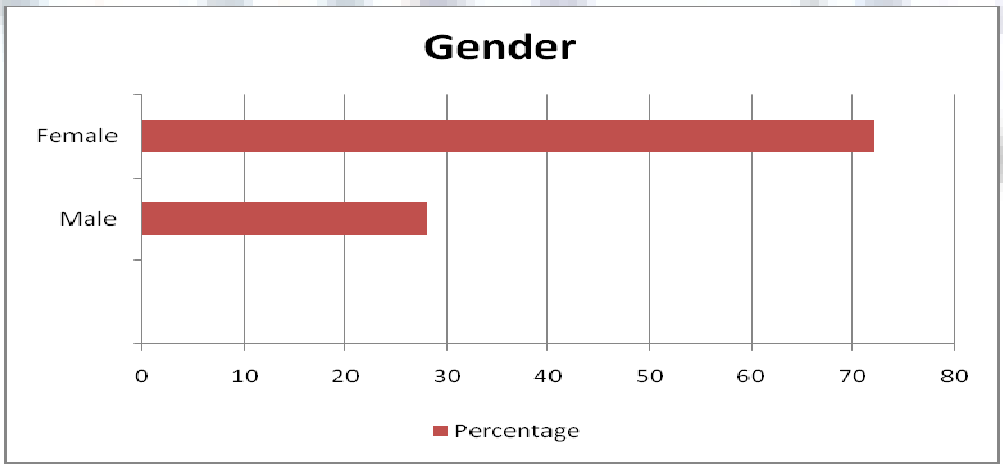
1. The table shows the classification of respondent on the basis of gender:

GENDER

Gender	No. of respondents	Percentage
Male	28	28
Female	72	72
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 72 % of the respondent are Female and 28 % of the respondents are Male.



2. The table represents the respondent's age group:

AGE

Age	No. of respondents	Percentage
Below 15 yrs	07	07
15-25 yrs	26	26
26-35 yrs	42	42
Above 35 yrs	25	25
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table represent that 42% of the respondent are belongs to age group of 26-35 yrs 26 % of the respondents are belongs to age group of 15-25 yrs, 25% of the respondent are belongs to age group of Above 35 yrs and 7 % of the respondents are belongs to age group of Below15

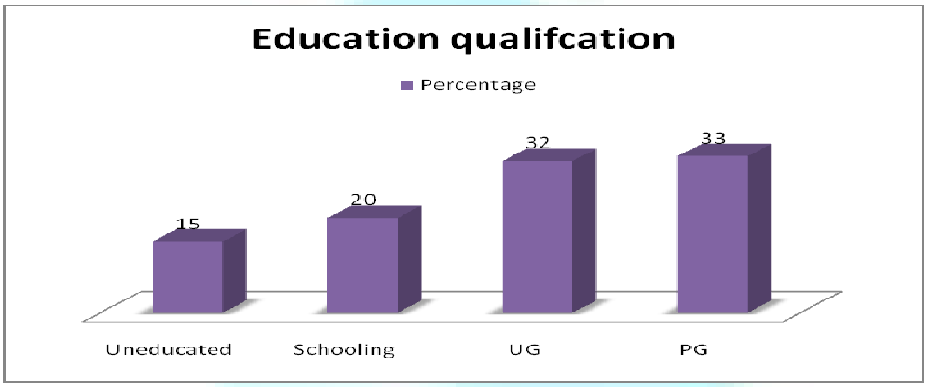
3. The table shows the Education Qualification of the respondent

EDUCATION QUALIFICATION

Education Qualification	No. of respondents	Percentage
Uneducated	15	15
Schooling	20	20
UG	32	32
PG	33	33
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The table indicates that 33% of the respondent are complete their PG 32% of the respondents are complete their UG, 20% of the respondent are complete their Schooling and 15 % of the respondents are Uneducated.



4. The table shows the classification of respondent on the basis of their Occupation

OCCUPATION

Occupation	No. of respondents	Percentage
Business	25	25
Private employee	34	34
Govt. employee	28	28
Agriculture	10	10
Other	03	03
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 34 % of the respondents are private employee, 28 % of the respondents are government employee 25% of the respondents areBusiness 10 % of the respondents are doing agriculture and 3 % of the respondents are other

5. This table indicates the number of Person in the respondent's family

NUMBER OF PERSON

Number of Person	No. of respondents	Percentage
2	27	27
3	20	20
Above 3	53	53
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The table indicates that 53 % of the respondents have above 3 persons in their family 27 % of the respondents have 2 persons in their family and 20 % of the respondents have 3 persons in their family.

6. The table represents the number earning Person in the respondent's family

NUMBER EARNING PERSON

Earning Person	No. of respondents	Percentage
1	14	14
2	26	26
3	47	47
Above 3	12	12
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 47 % of the respondents have 3 earning persons in their family 26 % of the respondents have 2 earning persons in their family 14 % of the respondents have 1 earning persons in their family and 20 % of the respondents have above 3 earning persons in their family.

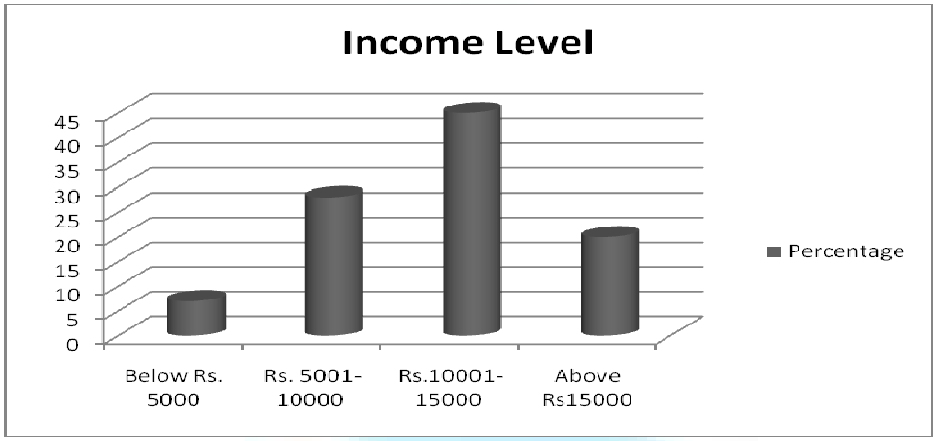
7. The table shows the respondent's Income level

INCOME LEVEL

Income level	No. of respondents	Percentage
Below Rs. 5000	07	07
Rs. 5001-10000	28	28
Rs.10001- 15000	45	45
Above 15000	20	20
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table represents that 45 % of the respondents having Rs 10001-15000 as monthly income. 45 % of the respondents are having Rs 10000-15000 as their monthly income 25 % of the respondents are having Rs 5001-10000 as their monthly income.20 % of the respondents are having Above Rs15000 as their monthly income and7 % of the respondents are having Below Rs 5000 as their monthly income.



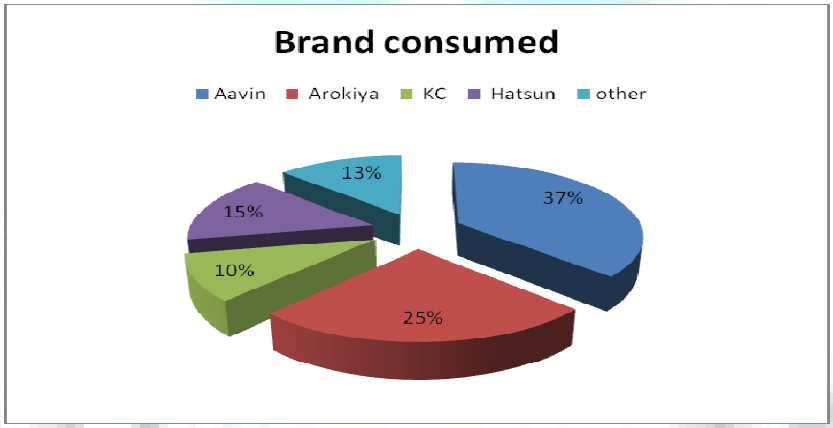
8. The table shows brand of milk consumed by the respondent

BRAND OF MILK CONSUMED

Brand	No. of respondents	Percentage
Aavin	37	37
Arokiya	25	25
KC	10	10
Hatsun	15	15
other	13	13
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 37 % of the respondents are consumed Aavin milk ,25 % of the respondents are consumed Arokiya milk,15 % of the respondents are consumed Hatsun milk,13 % of the respondents are consumed other milk and 10 % of the respondents are consumed KC milk.



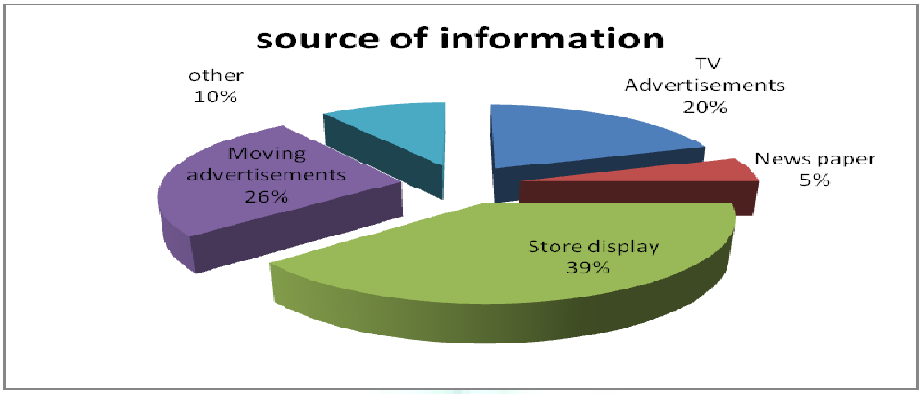
9. The shows the source by which the respondent know their brand

SOURCE OF INFORMATION

Source of information	No. of respondents	Percentage
TV Advertisements	20	20
News paper	05	05
Store display	39	39
Moving advertisements	26	26
other	10	10
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table represents that 39 % of the respondents are known their brand through store display 26 % of the respondents are known their brand through Moving advertisements , 20 % of the respondents are known their brand through TV Advertisements , 10 % of the respondents are known their brand through other and5 % of the respondents are known their brand through News paper.



10. The table represent whether the respondent see any mode of milk advertisement

SEEN ADVERTISEMENT

seen advertisement	No. of respondents	Percentage
Yes	100	100
No	0	0
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 100% of the respondents are see milk advertisement in any one of mode.

11. The table indicates in which media the respondent see milk advertisement frequently

MEDIA

Media	No. of respondents	Percentage
TV Advertisement	24	24
News paper	11	11
Moving Advertisement	16	16
Store display	37	37
Other	12	12
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 37 % of the respondents are see milk advertisement frequently in Store display, 24 % of the respondents are see milk advertisement frequently TV, 16 % of the respondents are see milk advertisement frequently in Moving Advertisement, 12 % of the respondents are see milk advertisement frequently in Other and 11% of the respondents are see milk advertisement frequently in News paper

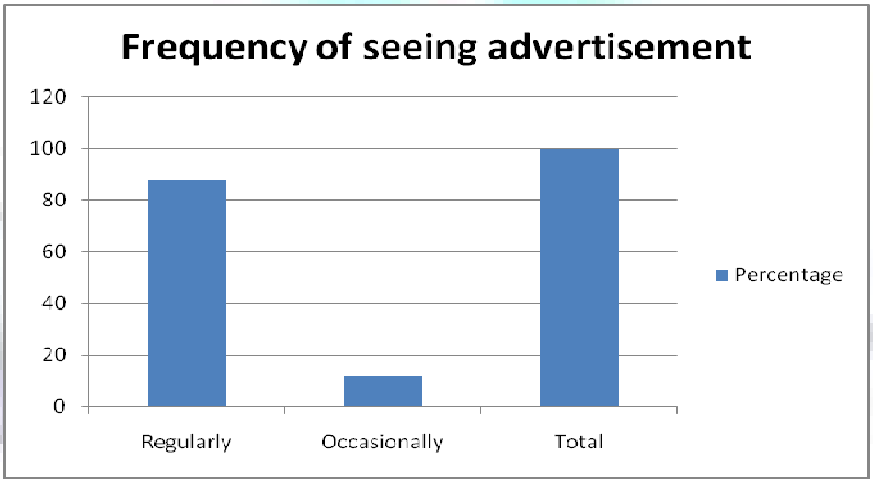
12. The table shows how often the respondents see milk advertisement

FREQUENCY OF SEEING MILK ADVERTISEMENT

Frequency	No. of respondents	Percentage
Regularly	88	88
Occasionally	12	12
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table represent that 88 % of the respondents are frequently see milk advertisement and 12 % of the respondents are occasionally see milk advertisement.



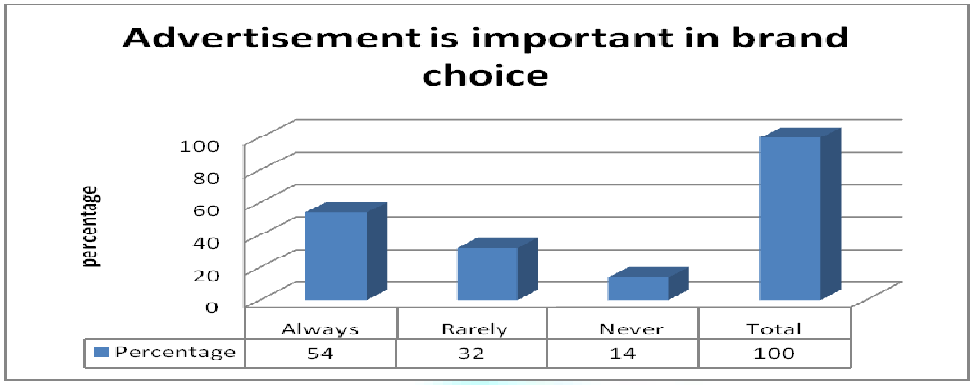
13. The table shows the importance of advertisement for the respondent's brand choice

IMPORTANCE OF ADVERTISEMENT

Importance Of Advertisement	No. of respondents	Percentage
Always	54	54
Rarely	32	32
Never	14	14
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table indicate that 54 % of the respondents feel advertisement is important for their brand choice, 32 % of the respondents feel advertisement is rarely important for their brand choice and 14 % of the respondents feel advertisement is never important for their brand choice.



14. The table shows how advertisements help the respondent in their brand choice

Advertisements helps	Highly Agree	Agree	Neutral	Disagree	Highly Disagree	Total
I can easily know about different brand	70	22	08	0	0	100
Reduce the probability of risk in decision making	0	56	31	13	0	100
I believe brand advertised is in good quality	0	40	35	25	0	100
The impact of advertisement is high in my brand choice	0	47	32	21	0	100
Easy for comparison		59	0	41	0	100
Updating of new brand	64	32	04	0	0	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 98 % of the respondent says that through advertisement they update the new brands in the market and 40 % of the respondents believe that brand advertised is in good quality.

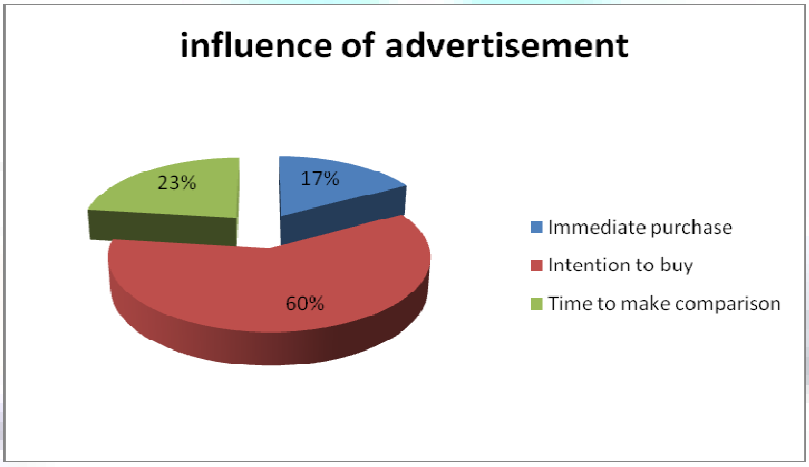
15. The table shows the level of influence of advertisement on respondent purchase

INFLUENCE OF ADVERTISEMENT

Influence of advertisement	No. of respondents	Percentage
Immediate purchase	17	17
Intention to buy	60	60
Time to make comparison	23	23
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table represent that 60 % of the respondents says milk advertisement create Intention to buy, 23 % of the respondents says milk advertisement make them to compare with other brand and 17 % of the respondents says milk advertisement make them to purchase immediately.



16. The table represent how advertisement support the company

SUPPORT THE COMPANY

support the company	No. of respondents	Percentage
Increase the sales	68	68
Creating and maintaining a brand identity	12	12
Communicating the product changes	10	10
Increase the buzz-value of the brand	10	10
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: From the above table it is inferred that 68 % of the respondents are feel that advertisement is the best way to increase the sales of the company, 12 % of the respondents are feel that through advertisement company can Create and maintain brand identity, 10 % of the respondents are feel that through advertisement company can easily communicating the product changes and 10 % of the respondents are feel that advertisement increase the buzz-value of the brand

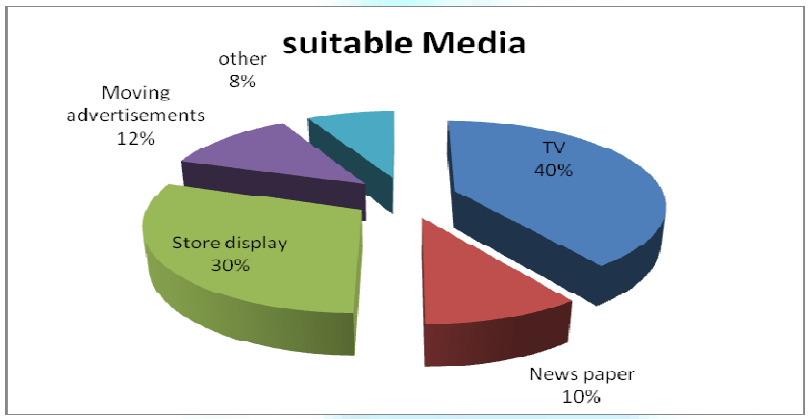
17. The table shows the suitable media for milk advertisement

SUITABLE MEDIA

suitable media	No. of respondents	Percentage
TV	40	40
News paper	10	10
Store display	30	30
Moving advertisements	12	12
other	08	08
Total	100	100

SOURCE: PRIMARY DATA

INFERENCE: The above table indicate that 40 % of the respondents feel TV is suitable media for milk advertisement, 32 % of the respondents feel Store display is suitable media for milk advertisement, 12 % of the respondents feel Moving advertisement is suitable media for milk advertisement, 10 % of the respondents feel News paper is suitable media for milk advertisement and 8 % of the respondents feel the above media is not suitable for milk advertisement.



CHI-SQUARE ANALYSIS

The following table shows the relationship between Gender and brand consumed by the respondent.

TABLE 1: RELATIONSHIP BETWEEN GENDER AND BRAND CONSUMED

Brand / Gender	Aavin	Arokiya	KC	Hatsun	other	Total
Male	9	5	3	5	6	28
Female	28	20	7	10	7	72
Total	37	25	10	15	13	100

HYPOTHESIS

H_0: There is no significant relationship between gender and Brand consumed by the respondents.

H1: There is significant relationship between gender and Brand consumed by the respondents.

Factors	Calculated value	Table value	Degree of freedom	Level of significant
Gender and brand consumed	3.39	9.48	4	5

INFERENCES

From above table it is inferred that calculated value (3.39) is lesser than table value (9.48) so we Accept H_0 (null Hypothesis) and Reject alternative hypothesis (H_1). Hence there is no significant relationship between gender and Brand consumed by the respondents.

The following table shows the relationship between education and importance of advertisement:

TABLE 2: RELATIONSHIP BETWEEN EDUCATION AND IMPORTANCE OF ADVERTISEMENT

Advertisement / Education	Always	Rarely	Never	Total
Uneducated	10	3	2	15
Schooling	12	5	3	20
UG	20	10	2	32
PG	12	14	7	33
Total	54	32	14	100

HYPOTHESIS

H_0: There is no significant relationship between Education and importance of advertisement for the respondent brand choice.

H1: There is significant relationship between Education and importance of advertisement for the respondent brand choice.

Factors	Calculated value	Table value	Degree of freedom	Level of significant
Education and importance of Advertisement	7.58	12.59	6	5

INFERENCES

From above table it is inferred that calculated value (7.58) is lesser than table value (12.59) so we Accept H_0 (null Hypothesis) and Reject alternative hypothesis (H_1). Hence there is no significant relationship between Education and importance of advertisement for the respondent brand choice.

The following table shows the relationship between income and brand consumed by the respondent.

TABLE 3: RELATIONSHIP BETWEEN INCOME AND BRAND CONSUMED

brand / Income	Aavin	Arokiya	KC	Hatsun	other	Total
Below Rs5000	2	1	1	1	2	7
Rs 5000 -10000	12	8	1	3	4	28
Rs 10001 -15000	16	11	5	8	5	45
Above Rs 15000	7	5	3	3	2	20
Total	37	25	10	15	13	100

HYPOTHESIS

H_0: There is no significant relationship between Income and Brand consumed by the respondents.

H1: There is significant relationship between Income and Brand consumed by the respondents

Factors	Calculated value	Table value	Degree of freedom	Level of significant
Income and Brand consumed	4.93	21.02	12	5

INFERENCES

From above table it is inferred that calculated value (4.93) is lesser than table value (21.02) so we accept H_0 (null Hypothesis) and reject alternative hypothesis (H_1). Hence there is no significant relationship between Income and Brand consumed by the respondents

FINDINGS

With the help of analysis and interpretation the following findings are find out through this study

- 78 % of the respondents are Female
- 42% of the respondents are belongs to age group of 26-35 yrs
- 33% of the respondents are complete their PG
- 34 % of the respondents are private employee
- 53 % of the respondents have above 3 persons in their family
- 47 % of the respondents have 3 earning persons in their family
- 45 % of the respondents have Rs 10001-15000 as their monthly income.
- 37 % of the respondents are consumed Aavin milk
- 39 % of the respondents are known their brand through store display
- 100% of the respondents are seeing milk advertisement in different mode.
- 37 % of the respondents are seeing milk advertisement frequently in Store display.
- 88 % of the respondents are frequently seeing milk advertisement
- 54 % of the respondents feel advertisement is important for their brand choice
- 98 % of the respondent says that through advertisement they update the new brands in the market
- 60 % of the respondents says milk advertisement create Intention to buy
- 68 % of the respondents are says that advertisement is the best way to increase the sales of the company
- 40 % of the respondents feel TV is suitable media for milk advertisement

HYPOTHESIS FINDING

- There is no significant relationship between gender and Brand consumed by the respondents.
- There is no significant relationship between Education and importance of advertisement for the respondent brand choice
- Hence there is no significant relationship between Income and Brand consumed by the respondents

CONCLUSION

This research study reveals that advertisement significantly influence the consumer behavior and attitude. Advertising satisfies the needs of the firm as well as the wishes of consumers. Advertisement role can never be replaced by any other means in this dynamic world of ours. Advertisements become the motivational sources which motivates consumer to materialize the purchase of their brand which helps the consumer for product evaluation and brand recognition. Irrespective of product advertisement play a major role in the formation of positive attitude among the consumers. According to Robinson advertisement make demand for product in inelastic way in long run. Therefore all firm should develop suitable strategize and know when and where they should advertise to gain maximum returns.

REFERENCES

1. Cohen D.(1988), "Advertising", Longman Higher Education Comanor, William. S. and Thomas. A. Wilson (1967), "Advertising, Market Structure and Performance," The Review of
2. Doyle P. (Nov., 1968), "Advertising Expenditure and Consumer Demand" Oxford Economic Papers, New Series, Vol. 20, No. 3 (Nov., 1968), pp. 394-416, Oxford University Press
3. Abideen, Zain Ul., Farooq, Waqas and Latif, Abdul. How urban children process advertising message: Specialreference to television advertising in Pakistan. *African Journal of Business Management*, Vol.5 (10), pp. 3962-3974. 18 May 2011.
4. Abideen, Zain Ul. & Latif, Abdul. Do Brand Extensions Affect Consumer Attitude: An Empirical Experience-With Reference To Pakistani Consumers. *The Journal of Applied Business Research,* 27(2), March/April, 2011,pp. 19-36.
5. Adeolu B. Ayanwale, Taiwo Alimi and Matthew A. Ayanbimipe (2005). The Influence of Advertising on Consumer Brand Preference. *Journal of Social Sciences*, 10(1): 9-16.
6. Adelaar, T., Chang, S., Lanchndorfer, K. M., Lee B. & Morimoto M. (2003). Effects of Media Formats on Emotions & Impulse Buying Behavior. *Journal of Information Technology*, 18, 247–266.
7. Featherstone M (1991), Consumer cultureand postmodernism, Sage, London
8. Alden D L, Steenkamp J B E M and Batra (1999),"Brand positioning through advertising in Asia, North America&Europe: The role of global consumer culture", Journal of Marketing, Vol. 63, pp.75-87.
9. Giddens A (2000), Runaway world, Routledge,New York.
10. Globalisation (2003), Flash Eurobarometerreport 151b (Oct.- Nov.).
11. Loudon L D and Bitta D J A (1994),Consumer Behavior, 4th Edition, McGrawHill, Inc., New York.
12. Shahid M I (1999), Mass Communication,2ndRev. Edition, Carvan Press, Lahore.
13. Source Dynamic Logic (2009), MagazinePublishers of America, October, 2009
14. Wilkie W L (1994),Consumer Behavior,3rdEdition, John Wiley & Sons, Inc., USA.
15. Wells W, Burnett J and Moriarty S (2000),Advertising Principles and Practice,5thEdition, Prentice Hall, USA

ANDROID OS FOR EMBEDDED REAL-TIME SYSTEMS

M. SATISH KUMAR
ASSOCIATE PROFESSOR
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ARUNKUMAR.G
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

GOWTHAMKUMAR.G
STUDENT
DEPARTMENT OF MCA
SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
CHITTOOR

ABSTRACT

Android has top trued the interest from associations, engineers and the general group. From that time up to now, this programming stage has been dependably improved either in terms of highlights or maintained hardware and, at the same time, extended to new sorts of devices various from the at first arranged convenient ones. Regardless, there is a highlight that has not been researched yet - its continuous limits. This paper anticipates that will research this gap and give a reason to examination on the suitability of Android set up to be used as a piece of Open Progressing circumstances. By looking at the programming stage, with the essential focus on the virtual machine and its basic working structure circumstances, we have the ability to point out its current breaking points and, thusly, give a knowledge on various perspectives of direction to make Android suitable for these circumstances. It can't avoid being our position that Android may give a suitable development demonstrating for steady embedded systems, however the continuous gathering should area its limits in a joint effort at all of the stage layers.

KEYWORDS
Catchphrases, Android, Open Progressing Systems, Introduced Structures.

1. PRESENTATION

Android was made unreservedly available in the midst of the fall of 2008. Being seen as a sensibly new development, on account of the way that it is up 'til now being significantly improved and upgraded either the extent that highlights or firmware, Android is getting quality both in the versatile business and in distinctive business ventures with different hardware architectures. The extending energy from the business rises up out of two middle perspectives: its open-source nature and its compositional model. Being an open-source undertaking, licenses Android to be totally dismembered and fathomed, which engages highlight compre- hension, bug fixing, further changes concerning new functionalities and, finally, porting to new gear. On the other hand, its Linux piece based auxiliary arranging model similarly adds the usage of Linux to the flexible business, allowing to adventure the learning and highlights offered by Linux.

Both of these perspectives make Android a connecting with center to be used as a piece of other sort of situations.Another point of view that is basic to consider when using Android is its own particular Virtual Machine (VM) environment. Android applications are Java-based and this variable includes the usage of a VM space, with both its purposes of interest and known issues.

By the by, there are highlights which have not been examined yet, concerning event the suitability of the stage to be used as a piece of Open Nonstop circumstances. Pondering works made previously, for instance, , either concerning the Linux part or VM circumstances, there is the probability of giving common guarantees bound together Nature of Organization (QoS) guarantees in each of the already expressed layers, or even in both, in a way that a possible joining may be fulfilled, fulfilling the transient prerequisites constrained by the applications. This compromise may be useful for intelligent media applications or even diverse sorts of employments obliging specific machine resources that need to be guaranteed in an advanced and propitious way. Along these lines, abusing the consistent capacities and resource change gave by the stage. In no time, the Linux part gives frameworks that allow a product designer to endeavor a crucial preemptive fixed need arranging methodology.

In any case, when using this kind of booking game plan it is illogical to accomplish authentic time conduct. Tries have been made in the implemen- tation of component booking arrangements which, rather of using fixed needs for arranging, usage the thought of component due dates. These component arranging arrangements have the playing purpose of achieving full CPU utilization bound, however meanwhile, they show a strange behavior when standing up to structure over-weights. Since structure 2.6.23, the standard Linux part uses the Absolutely Sensible Scheduler (CFS), which applies goodness in the way that CPU time is doled out to assignments. This balance guarantees that all the assignments will have the same CPU offer and that, each time that bad form is verified, the algo- rithm ensures that errand re-changing is performed. In spite of the way that sensibility is guaranteed, this figuring does not give any transient confirmations to endeavors, and as needs be, neither one of the androids does it, as its arranging operations are assigned to the Linux part.

Android uses its own specific VM named Dalvik, which was specifically made for phones and considers memory improvement, battery power saving and low fre- quency CPU. It relies on upon the Linux part for the inside meeting expectations system highlights, for instance, memory organization and arranging and, in this manner, moreover presents the drawback of not contemplating any common guarantees.

In the degree of the undertaking, there was the need of eval- uating Android as one of the possible target answers for be used for the structure's execution. As an eventual outcome of this appraisal, this paper discusses the ability of Android and the use orientation that can be grasped with a particular final objective to make it possible to be used as a piece of Open Continuous circumstances. In any case, our focal point is centered to sensitive veritable time applications and along these lines, hard-continuous applications were not considered in our appraisal.

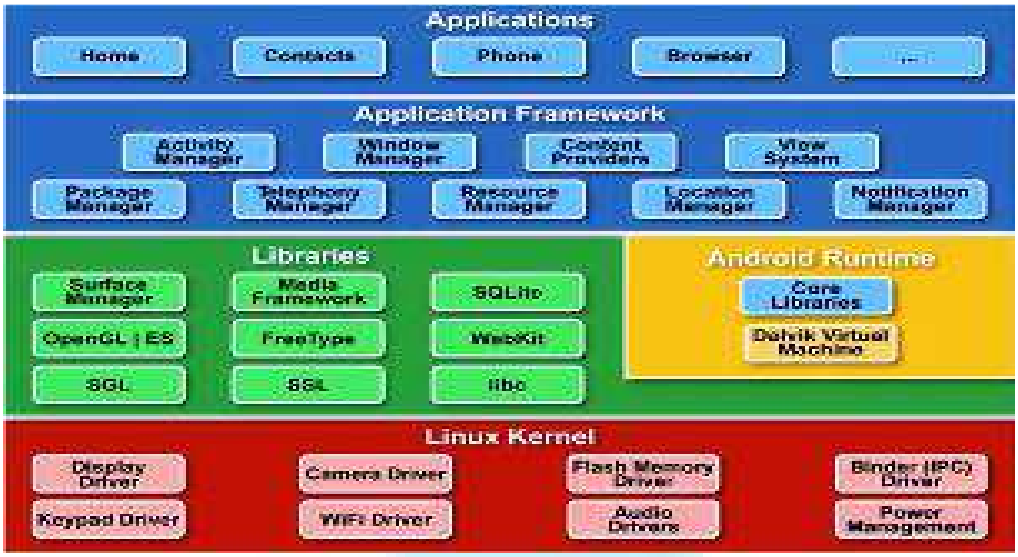
Whatever is left of this paper is dealt with as takes after: Sec- tion II briefly portrays the Android's auxiliary arranging. Section III presents a separated appraisal nearby a segment of the Android internals and its points of confinement when considering certifiable time circumstances. The substitute perspectives of increase are bare esse.

2. ANDROID'S STRUCTURAL ENGINEERING

Android is an open-source programming structural engineering gave by the Open Handset Collusion , a gathering of 71 innovation and versatile organizations whose objective will be to give a portable programming stage.

Underneath the Application Structure layer, there is another layer containing two vital parts: Libraries and the Android Runtime. The libraries give center highlights to the applications.

FIG. 1:ANDROID CONSTRUCTION MODELING



Among all the libraries gave, the most essential arelibc, the standard C framework library tuned for installed Linux-based gadgets; the Media Libraries, which bolster playback and recording of a few sound and feature designs; Design Motors, Text styles, a lightweight social database motor and 3D libraries taking into account OpenGL ES.

As to Android Runtime, other than the inner center libraries, Android gives its own particular VM, as already expressed, named Dalvik. Dalvik was outlined without any preparation and it is specifically focused for memory-obliged and CPU- compelled gadgets. It runs Java applications on top of it and dissimilar to the standard Java VMs, which are stack-based, Dalvik is an infinite register-based machine. Being a register- machine, it presents two points of interest when contrasted with stack-based machines.

To be specific, it requires 30% less instruc- tions to perform the same calculation as a commonplace stack machine, creating the decrease of guideline dispatch and memory access; and less processing time, which is additionally gotten from the disposal of normal statements from the guidelines. By and by, Dalvik presents 35% a bigger number of bytes in the guideline stream than an ordinary stack-machine. This disadvantage is repaid by the utilization of two bytes during an era when expending the guidelines.

Dalvik uses its own byte-code configuration name Dalvik Ex- ecutable (.dex), with the capacity to incorporate different classes in a solitary file. It is additionally ready to perform a few optimi- sations duringdexgeneration when concer ning the inside capacity of sorts and constants by utilizing standards, for example, negligible redundancy; every sort pools; and certain marking. By applying these standards, it is conceivable to havedexfiles littler than an ordinary Java file (container) file. Amid introduce time, eachdexfile is verified and optim isations, for example, byte- swapping and cushioning, static-connecting and strategy in- covering are performed to minimize the runtime assessments and in the meantime to keep away from code security infringement.

The Linux piece, form 2.6, is the bottommost layer and is additionally an equipment reflection layer that empowers the collaboration of the upper layers with the equipment layer by means of gadget drivers. Moreover, it likewise gives the most basic framework administrations, for example, security, memory man- agement, process administration

3. SUITABILITY OF ANDROID FOR OPEN REALTIME SYSTEM (FRAMEWORK)

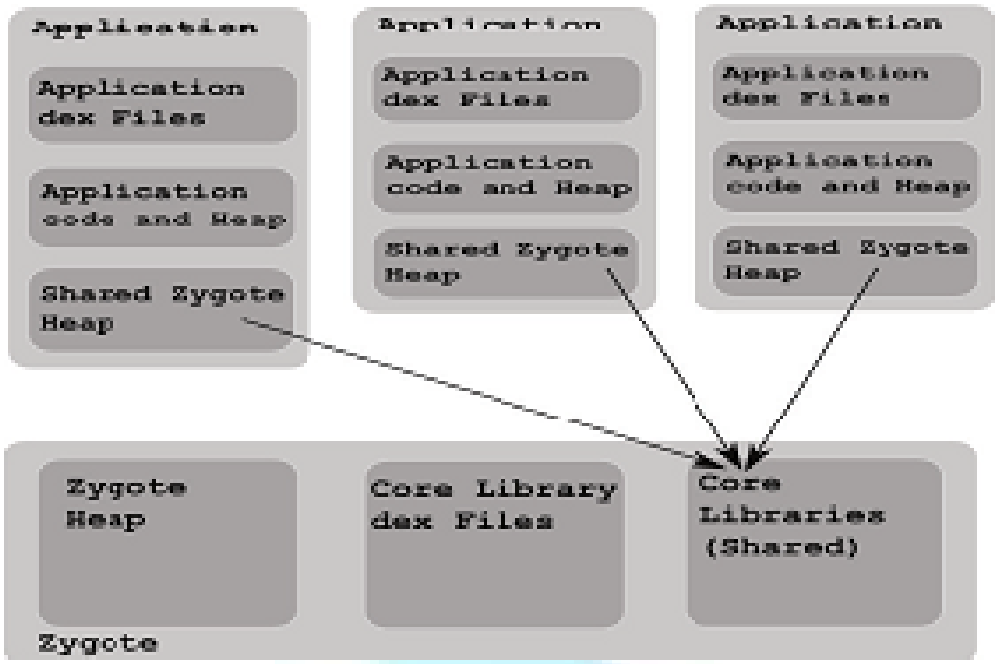
This territory inspects the suitability of Android for open embedded consistent systems, examinations its building configuration internals and points out its current limitations. Android was surveyed considering the going with subjects: its VM surroundings, the concealed Linux part, and its benefit organization limits.

Dalvik VM is prepared for running different free approaches, each one with an alternate area space and memory. Thus, every Android application is mapped to a Linux system and prepared to use a between methodology commu- nication framework, in perspective of Open-Spread , to com- municate with distinctive systems in the structure. The limit of partitioning each technique is given by Android's archi- tectural model.

In the midst of the contraption's boot time, there is a procedure accountable for starting up the Android's runtime, which induces the startup of the VM itself. Characteristic to this endeavor, there is a VM process, the Zygote, responsible for the preinitialisation and preloading of the ordinary Android's classes that will be used by the dominant part of the applications. Af- terwards, the Zygote opens a connection that recognizes summons from the application structure at whatever point another Android application can't avoid being started. This will cause the Zygote to be forked and make a child process which will then transform into the target application. Zygote has its own specific heap and a game plan of libraries that are conferred among all techniques, while each system has its own specific course of action of libraries and classes that are independent from substitute strategies. This model is shown in Figure 2. The strategy is beneficial for the system as, with it, it is possible to extra Slam and to quicken each application startup process.

Android applications give the typical synchronisa- tion instruments known to the Java bunch. Truth be told talking, each VM event has no under one essential string and may have a couple of diverse strings running all the while. The strings fitting in with the same VM case may relate and synchronize with each other by the system for granted inquiries and screens. The Programming interface also allows the usage of synchronized schedules and the development of string social events with a particular final objective to encourage the control of a couple of string operations. It is moreover pos- sible to dole out necessities to each string. Right when a designer modifies the need of a string, with only 10 need levels being allowed, the VM maps each of the qualities to Linuxnice values, where lower qualities show a higher need. Dalvik takes after thepthreadmodel where all the thr eads are managed as nativepthreads. Inward VM strings bel ong to one string social affair and all other application strings fit in with another get-together. According to source code examination, Android does not give any instruments to turn away need inversion neither grants strings to use Linux's consistent needs inside Dalvik.

FIGURE 2: ZYGOTE STACK



Strings may suspend themselves or be suspended either by the City specialist((GC), debugger or the sign screen string. The VM controls all the strings through the use of an inside structure where all the made strings are mapped. The GC will simply run when all the strings suggesting a lone methodology are suspended, with a particular deciding objective to avoid clashing states.

The GCs have the difficult undertaking of dealing with component mem- ory organization, as they are accountable for deallocating the memory dispersed by things that are no more needed by the applications. Concerning Android's deny gathering method, as the approaches run autonomously from distinctive procedures and each approach has its own heap and a conferred heap - the Zygote's store - Android runs separate events of GCs to assemble memory that is not being used any more. Thus, every technique stack is reject assembled unreservedly, through the use of parallel engraving bits that sign which inquiries may be cleared by the GC. This part is particularly useful in Android on account of the Zygote's granted heap, which for this circumstance is kept untouched by the GC and licenses a predominant use of the memory.

Android uses the engraving clear estimation to perform garbage gathering. The rule purpose of interest gave by the stage is that there will be a GC running each technique, which wipes all the articles from the application heap of a specific process. Accordingly, GCs having a spot with diverse strategies won't influence the GC running for a specific process. The essential inconvenience rises up out of the estimation used. As this estimation derives the suspension of each and every one of strings having a spot with an application, this suggests that no consistency can be achieved as that specific strategy will be freezed while being waste assembled.

Android's VM relies on upon the Linux piece to perform all the arranging operations. This suggests that all the strings running on top of the VM will be, regularly, arranged with SCHED OTHER, and as being what is shown will be deciphered into the sensible arrangement gave by the piece. In this way, it is impossible to demonstrate that a particular errand needs to be occupied using an other booking arrangement.

Meddle with/evsent dealing with has another basic impact when concerning progressing structures, as it may incite in- relentless states if not dealt with honestly. At present, Android relies on upon the Linux bit to dispatch the meddle with/event by method for contraption drivers.

As already communicated, Android relies on upon the Linux segment for highlights, for instance, memory organization, strategy supervise ment and security. As being what is shown, all the booking activities are designated by the VM to the piece.

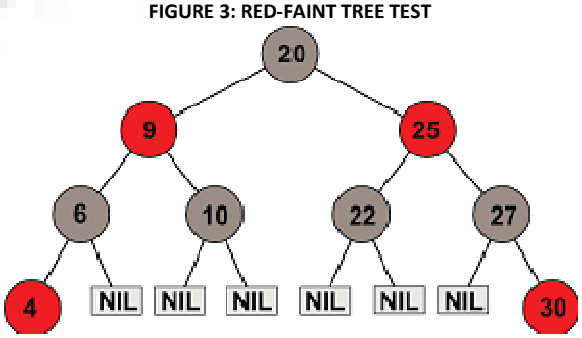
Android uses the same scheduler as Linux, known as Absolutely Sensible Scheduler (CFS). CFS has the focus of giving concordance between assignments consigned to a processor. For that, it uses a red-dull parallel tree, as displayed in Figure 3, with altering toward oneself capacities, suggesting that the longest route in the tree is near to double the length of the most restricted way. Other discriminating edge is the efficiency of these sorts of trees, which demonstrate a multifaceted design ofO(logn), wherenrepresents the number o f parts in the tree. As the tree is being used for booking purposes, the equality variable is the measure of time provided for a given undertaking.

This variable has been named virtual runtime. The higher the endeavor's virtual runtime regard, the lower is the necessity for the processor. The extent that execution, the count goes about as takes after: the errands with lower virtual runtime are situated on the left a large portion of the tree, and the assignments with the higher virtual runtime are situated on the benefit. This infers that the errands with the most huge prerequisite for the processor will reliably be secured on the left 50% of the tree. By then, the scheduler picks the uttermost left center point of the tree to be occupied. Each endeavor is accountable for accounting the CPU time taken in the midst of execution and expanding the estimation of the past virtual runtime regard.

By then, it is implanted at the end of the day into the tree, in case it has not finished yet. With this illustration of execution, it is guaranteed that the errands battle the CPU time in a sensible manner.

Another piece of the conventionality of the estimation is the changes that it performs when the endeavors are sitting tight for an I/O contraption. For this circumstance, the endeavors are reimbursed with the measure of time taken to get the information they anticipated.

FIGURE 3: RED-FAINT TREE TEST



Since the presentation of the CFS, the considered schedul- ing classes was in like way showed. On an extremely fundamental level, these classes give the relationship between the chief flat sched- uler functionalities and the specific scheduler classes that execute the booking tallies. This idea permits two or three assignments to be masterminded contrastingly by utilizing specific numbers henceforth.

At this time, the Linux piece supports two booking certifiable time classes, as bit of the consistence with the POSIX standard , SCHED RR and SCHED FIFO. SCHED RR may be used for a round robin arranging procedure and SCHED FIFO for a first-in, first-out course of action. Both methodologies have a high impact on the structure's execution if horrendous star gramming applies. In any case, most of the endeavors are arranged with SCHED Distinctive class, which is a non ceaseless game plan. The task booking plays one of the most basic parts concerning the progressing highlights presented by a standard ticular system. Starting now, Linux's steady execution is limited to two booking constant classes, both in light of need arranging. Another key edge to be considered in the evaluation is that most of the errands are occupied by CFS. Regardless of the way that CFS tries to streamline the time an errand is sitting tight for CPU time, this effort is lacking as it is not fit for giving guaranteed response times.

One discriminating perspective that should be remarked is that regardless of the way that the Linux segment supports the continuous classes already expressed, these classes are open for native1 Android applications. Normal Android applications can simply abuse the synchronization instruments portrayed 1 A neighborhood application in Android is an application that can run on top of the Linux bit without the need of the VM former in this paper. Concerning synchronization, Android uses its own im- plementation oflibc- namedbionic.bionichas its own execution of thepthreadlibrary and it doesn't su pport methodology conferred mutexes and condition variables. In any case, string mutexing and string condition variables are maintained in a limited manner. Instantly, between philosophy correspondence is dealt with by Open-Clasp. Concerning limitations, the segments gave by the basic building don't handle the old issues related with need inversion. Thusly, synchronization traditions, for instance, need rooftop and inher- itance are not realized.

The extent that meddle with/event dealing with, these are performed by the piece through device drivers. Accordingly, the piece is notified and after that is responsible for telling the application sitting tight for that specific meddle with/event. None of the parts included in the dealing with has a thought of the time constrainments open to perform its operations. This behavior gets the opportunity to be more real when considering barges in.Concerning resource organization diverted at the VM level, CPU time is controlled by the booking figurings, however memory can be controlled either by the VM, if we consider the stores and its memory organization, or by the working structure bit. As for, operations, for instance, accounting, part and reallocation can be performed. All these operations encounter the evil impacts of an unbounded and non-deterministic behavior, which suggests that it is doubtful to define and measure the time considered these operations. The framework is out of degree of our examination and thusly was not surveyed.

At the segment level, aside from the CPU and memory, all the remaining structure's gear is gotten to through device drivers, remembering the final objective to perform its operations and control the advantages' status.

Regardless, an overall director that has a complete data of the applications' necessities and structure's status is missing. The carefulness of advantages among applications obliges fitting control segments if continuous sureties will be given. Each application has an advantage interest identified with each quality level it can give. Then again, under confined resources not all applications will have the ability to pass on their most compelling quality level. Appropriately, an overall resource boss has the limit assign resources for fighting applications so that an overall streamlining goal of the system.

4. POSSIBLE COURSE

This portion discusses four possible course to incor- porate the pined for steady transmit into the Android development demonstrating. The first strategy considers the substitution of the Linux working structure by one that gives continuous highlights and, meanwhile, it considers the fuse of a steady VM. The second approach respects the Android standard building outline by proposing the expansion of Dalvik and moreover the substitution of the standard working system by a ceaseless Linux-based working structure. The third approach just replaces the Linux working structure for a Linux persistent interpretation and progressing applications use the bit direct. Finally, the fourth approach proposes the extension of a steady hypervisor that support the parallel execution of the Android organize in one assignment while the other part is given to the continuous applications. Regarding first procedure, depicted in Figure 4, this system replaces the standard Linux piece with a progressing working structure.

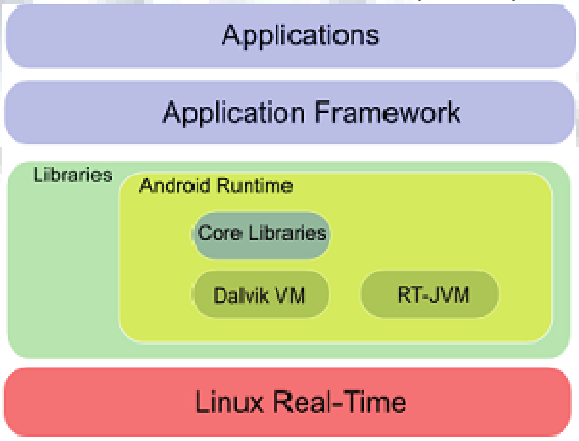
This modification presents consistency and determinism in the Android auxiliary arranging. Along these lines, it is possible to present new dynamic constant schedul- ing game plans through the use of arranging classes; envision need inversion and to have better resource organization strategies. Then again, this modification includes that all the contraption drivers supported by regional standards need to be executed in the working system in light of consistency. This endeavor can be troublesome, uncommonly in the midst of the blend stage. Taking all things into account, this strategy moreover leaves space for the imple- mentation of the obliged constant highlights in the Linux segment.

Completing the highlights in the standard Linux bit obliges time, yet it has the purpose of enthusiasm of giving a more reliable joining with the remaining parts having a spot with the architectures included.

These upgrades are seen as the most influential in finishing the arranged deterministic behavior at the VM level. It is basic to note that the progressing VM works together particularly with the working system's piece for highlights, for instance, undertaking arranging or restricted memory man- agement. As a specimen, if one considers task booking, the progressing VM is prepared for mapping each errand generally on the working system where it will be occupied. If the working system reinforces diverse sorts of arranging courses of action other than the fixed need based scheduler, the VM may use them to timetable its assignments. This infers that most of the operations gave by steady Java VMs are limited to the joining between the VM's reinforced highlights and the maintained working structure's highlights.

Other playing point from this procedure is that it is not vital to stay mindful of the release cycles of Android, in spite of the way that some joining issues may rise between the VM and the piece. The impact of showing another VM.

FIGURE 4: ANDROID FULL CONTINUOUS (REALTIME)



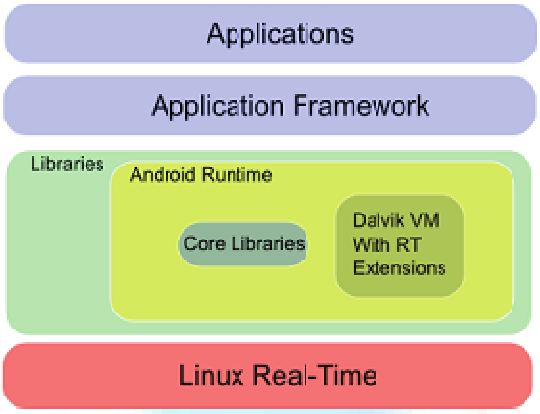
In the system is related to the truth that all the Android specificities must be executed too asdexsupport in the interpreter. Other than this drawback, distinctive troubles might position, for instance, the blend between both VMs.

This in- tegration maybe includes the itemizing of new counts to overhaul arranging and memory organization to be possible to have a perfect composed system general besides to treat progressing applications in the right way.

The second proposed approach, showed in Figure 5, similarly displays modifications in the auxiliary building both in the working system and virtual machine circumstances. Concerning the working structure layer, the great circumstances and bothers showed in the first philosophy are seen as comparable, as the guideline behind it is the same. The huge qualification lies on the enlargement of Dalvik with progressing capacities considering the Ceaseless Specification for Java (RTSJ) .Regardless, its use only depends on upon the degree one wishes to have, suggesting that a full reliable execution may be accomplished if the key utilization effort is joined in the VM developments and the working system's reinforced highlights.

This extension is beneficial for the system as with it, it is possible to unite a more deterministic behavior at the VM level without the need of stressed over the particularities of Dalvik. In light of present circumstances, this technique has the prevention of expecting to stay mindful of the release cycles of the Android, more extraordinarily the VM itself, if one needs to add these extensions to all the open types of the stage.

FIGURE 5: ANDROID EXTENDED



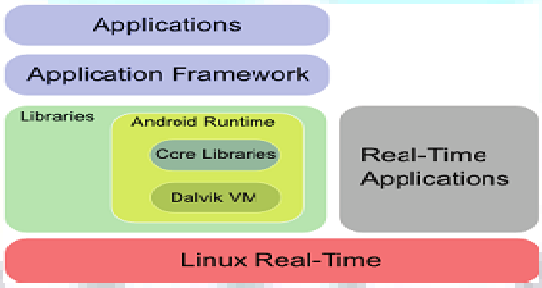
Two instances of this bearing are and . The work in states that the execution of an advantage organization framework is possible in the Android stage with a couple of modifications in the stage. In spite of the way that the results presented in this work are considering the CFS scheduler, work is being done to update the scheduler to a hardly modified manifestation of EDF, that unites reservation- based arranging figurings as showed.

The work reported can't avoid being being transmitted in the degree of Partakes endeavor, where a confirmation of thought of a QoS-careful structure for pleasant introduced authentic time systems has starting now been delivered for the Android stage. Other basic piece of this work is the im- plementation of another component arranging procedure named Breaking point Conferring and Taking (CSS) in the Android stage.

Both works show that it is possible to propose new techniques in perspective of the standard Linux and Android ar- chitectures and incorporate persistent behavior to them with a particular finished objective to take advantage of resource reservation and consistent errand arranging. With both of these highlights, any of these systems is fit for guaranteeing resource information exchange ability to applications, inside a between time of time, without taking a chance with the system.

The third proposed strategy, depicted in Figure 6, is moreover arranged in Linux progressing. This technique misuses the neighborhood environment, where it is possible to send authentic time applications direct over the working system. This can be ideal for applications that needn't trouble with the VM environment, which suggests that an insignificant effort will be needed for blend, while having the same arranged behavior. On the other hand, applications that need a VM circumstance won't benefit from the nonstop limits of the fundamental working structure.

FIGURE 6: ANDROID MOSTLY STEADY



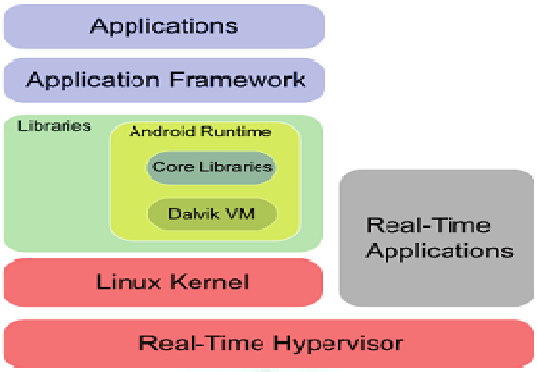
Finally, the fourth approach, outlined in Figure 7, Utilizes a consistent hypervisor that is prepared for running Android as a guest working system in one of the packages and nonstop applications in another designation, in a parallel manner. This procedure is similar to the technique taken by the greater part of the current progressing Linux game plans, for instance, RTLinux or RTAI . These systems have the ability to run consistent applications in parallel to the Linux bit, where the progressing endeavors have higher need than the Linux piece assignments, which infers that hard steady can be used. Of course, the Linux part assignments are occupied using the additional time staying from the CPU segment. The essential drawback from this approach is that nonstop applications are confined to the highlights offered by the honest to goodness time hypervisor, inferring that they can not use Dalvik or even a vast segment of the Linux organizations. Other limitation known lies in trans

5. CONCLUSION

At first look, Android may be seen as a potential center for steady circumstances and, likewise, there are different industry concentrates on that would benefit from an auxiliary arranging with such limits. Investigating this, this paper presented the evaluation of the Android stage to be used as a continuous structure. By focusing on the middle parts of the system it was possible to reveal the points of confinement and thereafter, to present four possible course that may be taken after to incorporate constant behavior to the structure.

Android was made to fill the versatile business needs and that truth has an impact in travel that the auxiliary building may be used. On the other hand, with some effort, as showed by the displayed philosophies, it is possible to have the pined for certifiable time lead on any Android device. This behavior may suit specific applications or parts by issuing them the limit of abusing passing confirmations, and appropriately, to act in an all the more obvious way.

FIGURE 7: ANDROID WITH A CONTINUOUS HYPERVISOR



In any case, this effort must be had a tendency to at the particular layers of the building outline, in a joined way, with a particular deciding objective to consider potential extensions to be useful for the commercial industries

REFERENCES

1. O. H. Alliance, "Home page," Jun. 2010. [Online]. Available: http://www.openhandsetalliance.com/
2. D. Bornstein, "Dalvik vm internals," Mar. 2010. [Online]. Available: http://sites.google.com/site/io/dalvik-vm-internals
3. P. Inc., "Openbinder 1.0," Mar. 2010. [Online]. Available: http://www.angryredplanet.com/~hackbod/openbinder/
4. IEEE, "Ieee standard 1003.1," Mar. 2010. [Online]. Available: http://www.opengroup.org/onlinepubs/009695399/
5. M. T. Higuera-Toledano and V. Issarny, "Java embedded real-time systems: An overview of existing solutions," in Proceedings of the Third IEEE International Symposium on Object-Oriented Real-Time Distributed Computing (ISORC 2000). Washington, DC, USA: IEEE Computer Society, 2000, pp. 392–399.
6. R.-T. S. for Java, "Rtsj 1.0.2," Jan. 2010. [Online]. Available: http://www.rtsj.org/specjavadoc/book index.html
7. R. Guerra, S. Schorr, and G. Fohler, "Adaptive resource management for mobile terminals - the actors approach," in Proceedings of 1st Workshop on Adaptive Resource Manage- ment (WARM10), Stockholm, Sweden, April 2010.
8. C. Maia, L. Nogueira, and L. M. Pinho, "Experiences on the implementation of a cooperative embedded system frame- work," CISTER Research Centre, Porto, Portugal, Tech. Rep., June 2010.

QUALITY AND AUDIT FEES: EVIDENCE FROM PAKISTAN

MUHAMMAD MOAZAM KHAN
RESEARCH SCHOLAR
INTERNATIONAL ISLAMIC UNIVERSITY
ISLAMABAD

FAHIM JAVED
LECTURER
COMSATS INSTITUTE OF INFORMATION TECHNOLOGY
ISLAMABAD

ABSTRACT

Audit quality has been in the limelight for researchers over the last two to three decades. Researchers have endeavored to find out the factors that impact the quality of audit conducted by the auditors. The recent financial crises and financial scandals have further enhanced the importance of this topic. Although it is an empirically established fact that auditor's performance is impeded by a number of factors that curb its independence however sudden surge in the emoluments of auditors during the last decades has actuated the researchers to study audit quality in context of compensation fee paid to the auditors. The results of studies differ as some are of the view that audit quality improves with the payment of excess fee while the rest are of the opposite view. Unluckily, Pakistan has been less explored in this regard and not even a single study has addressed the issue of audit quality in Pakistan. This study has attempted to analyze audit quality in context of abnormal or extra fee paid to auditor. Audit conducted without independence of auditor is futile and results in impairment of audit quality. Independence of auditor is usually curbed by extra fee paid to him, and auditor in fear of losing a lucrative fee does not report the misrepresentations of financial statements in his audit report. This study uses discretionary accruals as surrogate of audit quality which are computed by Cross-sectional Modified Jones Model (1995). The results are fortunately good for Pakistan and study has observed that auditors in Pakistan do not compromise on their standards and honesty when paid extra fee. In Pakistan, the quality of audit is not impaired when auditors are paid extra fee and the auditors work with diligence and exert extra effort to improve the audit quality. Therefore, the assertion that audit quality is impaired when high fee is paid to auditors does not hold well in Pakistan.

KEYWORDS
Audit fee, Audit Quality.

1.1 INTRODUCTION

Auditor's role in society is to assure interested third parties that corporate report and financial statements are true and fair reflection of company's performance. In order to perform this role, it is essential that auditors are independent of client. Independence is necessary for performing quality audit (Dart, 2011). Thus it is necessary that auditor must make an independent opinion after the examination of financial statements. An audit would be futile if it is conducted without full independence because the independence of an auditor has major impact on the audit quality. It can be argued that the audit quality is a function of auditor independence (Larcker and Richardson, 2004).

The independence of auditor can be curbed if the auditor is economically dependent upon the client. Economic dependence on client means that either the major share of auditor's revenue comes from a single client or auditor is paid high above his expectations and efforts. Therefore, the study of audit quality in context of audit fee is an interesting issue which shall be explored in this study.Although the relationship between audit quality and audit fee is examined in various studies, but still the relationship isambiguous. There may be two different consequences of paying excess fee to auditor. The auditor may increase effort in the process of audit resulting in a higher quality of audit (Mitra et al., 2009); conversely, excess fee paid to auditor may make him dependent on his client and hence there is a threat of low audit quality (Choi et al., 2010). Auditor may not raise issues with the material misstatement of client because he has risk of losing a lucrative fee.

It is believed that examining fees paid by firms to auditor in the context of auditor profitability better captures the relation between audit quality and auditor independence (Hoitash et al., 2005). Moreover, the auditor's independence can be best analyzed by looking at the fees paid to them relative to their expected amount i.e. adjusted for their effort, time spent and risk. Therefore this study will explain the relationship between audit quality and audit fee by splitting audit fee into expected and unexpected (abnormal) component.

The objective of this study is to analyze audit quality in context of Pakistan by using the discretionary accruals as measure of audit quality. The audit quality is analyzed by examining its relationship with abnormal or excess audit fees. Audit fee can be divided into normal and abnormal fee (Choi et al., 2010). Normal fees are determined by the factors which are common across the clients such as size, complexity and client risk, while the abnormal fees are as a result of negotiation between the client and auditor and may be called as excess fees. Thus, the objective is to see whether the audit excess fee (abnormal fee) has an impact on audit quality or not.

1.2 PURPOSE AND SIGNIFICANCE OF STUDY

Pakistan has not been explored much regarding auditing and therefore, a very scant literature is available in this regard. Previous audit studies conducted in Pakistan have focused audit fees and its determinants in Pakistan, while no study has emphasized the issue of audit quality. This study therefore, explores the relationship of audit fee and audit quality which has never been studied in Pakistan.

1.3 IMPLICATIONS OF STUDY

The practical advantage of this study is that it will help in assessing the performance of auditors and the quality of audit conducted by them when remunerated above their expectations. Moreover, the relationship between audit fee and audit quality is ambiguous and needs further evidence. The current study therefore, adds to the literature by providing the analysis of audit quality and its relationship with audit fees in context of Pakistan which has never been addressed in the past.This study will also explain auditor's professionalism in Pakistan.

The rest of the paper is organized as follows: next section reviews the literature of audit fee and its relationship with audit quality. Then the research strategy and methodology used to find out relationship of audit fee and audit quality is discussed. Next the statistical analysis and results generated from audit quality model are discussed. The last section concludes the study.

2. REVIEW OF LITERATURE

2.1 AUDIT QUALITY

An audit would be of high quality if the auditor is fully independent while conducting the audit (DeAngelo, 1981). The independence of auditor can be curbed by different factors and the important one among those factors is fee given by the client to auditor. An auditor dependent upon a particular client may conduct the audit in a lenient way and therefore compromise the quality of audit. The study of audit quality and audit fee is necessary as it helps both regulators and auditors to improve the audit quality standards.

2.1.1 AUDIT (ABNORMAL) FEE AND AUDIT QUALITY

Literature of auditing shows mixed evidence regarding the relationship between high or abnormal fee paid to client and audit quality. It is said by researchers that high fee paid to the auditor may encourage him to put his maximum efforts in conducting the audit and disclose the material financial misstatements of his client. On the other side, high fee paid to auditor may make him economically dependent upon his client and the auditor will be reluctant to disclose material misstatements, if any, of the client. Some of the mixed evidences regarding (abnormal) audit fee and audit quality are discussed ahead.

Larcker and Richardson (2004), conducted a study to find out the relationship between high (abnormal) fee paid by clients to auditing firms and quality of accruals in financial statements of client (audit quality). The study covers US market with 5103 firm year observations and time period of two years 2000-2001. Similar to previous studies, absolute discretionary accruals is used as proxy for audit quality and regressed on different measures of fee. Abnormal audit fee is considered for analysis instead of total fee to find out the audit quality when the auditors are paid excess of their remuneration and abnormal audit fee of auditor is found out from the residuals of traditional (Simunic, 1980) audit fee model. They say that the relationship between accruals (proxy for audit quality) and abnormal audit fee is positive only when the audit fee is measured by using ratio of non-audit fee to total audit fee, otherwise there is no significant relationship between earnings quality and auditor's independence. Larcker and Richardson (2004), say that the relationship between audit quality and audit fee is sensitive to the measures used for auditor independence. The overall results of their study suggest that auditors care about their reputation and 'reputation protection' refrains them from being lenient for a client in the audit of his financial misstatements. Therefore auditors do not compromise their independence even they are paid high fees.

Contrary to above findings, Hoitash et al. (2007), in their study of auditor fee and audit quality find evidence that audit quality is impaired when auditors are paid high fee above their expectations. They say that the relationship between auditor's independence and audit quality can be best described if the fees paid by client are analyzed in context of the profitability of auditor. The independence of auditor is thus influenced by the amount of fee relative to the auditor effort. Hoitash et al. (2007), say that an auditor may not raise objection with the misstatements of client who is paying him a lucrative fee and above the efforts done by him in conducting the audit. Hoitash et al. (2007), conduct their study by analysis of US market, taking 13860 observations for time period of four years 2000-2003. They use performance matched absolute discretionary accruals and current accruals relating to cash flows as proxy for audit quality. These both proxies for audit quality are regressed on total and abnormal audit fee. The result of their study shows that there is a significant positive relationship between (total and abnormal) fee and both type of accruals used as proxy for audit quality. The relationship was significant and positive in all the years of analysis. The results show that economic bonding between client and auditor leads to impairment of audit quality. Hoitash et al. (2007), conclude that an auditor if paid above his efforts and risk is likely to avoid any conflict with his client regarding material misstatements and thus compromise on the audit quality.

Similar findings are shown by Choi et al. (2010), in their study of US market regarding audit quality and audit fee. Choi et al. (2010), say that the actual audit fee paid to auditor by a client consists of two parts i.e. normal and abnormal. Normal fees depend upon the factors which are common across all the clients. The normal fee of auditor can also be called as expected fee. The other part of actual audit fee i.e. abnormal fee is unusual and unexpected component of audit fee. The abnormal fee depends upon the auditor client relationship and negotiation power of both auditor and client. Choi et al. (2010), conduct their study by using 2081 firm year observations covering time period from 2000 to 2003. Similar to previous studies, absolute discretionary accruals is used as proxy for audit quality and regressed on abnormal audit fee. The results of their study show that there is a significant positive relationship between abnormal audit fee and discretionary accruals (inverse measure of audit quality) when the abnormal fees are positive. While the relationship between abnormal audit fee and audit quality is insignificant when the abnormal fees are negative or less than expectations. It means that the auditors which are paid high above their expectations compromise on audit quality and they think that high fee can outweigh the risk and costs associated with litigation or reputation loss. This study also shows that when auditors are not paid above their expectations then they do not compromise on audit quality as they have less incentives and more loss to suffer in case of litigation or audit failure.

The study done by Mitra et al. (2009), negates the conclusion drawn by the study of Hoitash et al. (2007), and Choi et al (2010). Mitra et al. (2009), conducted a study of US market to test the audit quality and audit fee relationship. They say that independence of an auditor can be impaired if an auditor gets unexpected high fee from his client. Study uses a sample of 1142 firms covering time period of six years i.e. 2000 to 2005. Similar to previous studies, performance matched discretionary accruals are used as proxy for audit quality and computed from modified cross-sectional Jones model (Dechow, 1995). The audit fee is split into two components expected (normal) and unexpected fee (abnormal). The results of study show that the amount of discretionary accruals had negative relationship with both expected and unexpected fee. Mitra et al. (2009), say that the high fees paid to auditors do not curb their independence rather it helps in improving the quality of audit. Auditors exert extra effort in improving the audit quality and this shows that auditors care about their reputation and honesty.

Kraub et al. (2011), find out the results contrary to the findings of Mitra et al. (2009), Kraub et al. (2011), tested the relationship of audit quality and audit fee in German market. Study uses a sample of 717 firms and the period of study is from 2004 to 2009. Audit quality is measured with two proxies i.e. accounting restatement or error announcements and discretionary accruals. Similar to previous studies, abnormal fee is used instead of total fee in analysis. They say that abnormal fees can be called as attempted bribe to auditors and clients by giving abnormal fees to auditors urge the auditors not to object or raise questions at the financial misstatements and earnings management. The results of study show that both proxies for audit quality have positive relationship with the positive abnormal fee. The auditors which get positive abnormal fee from their clients allow the clients to indulge in earnings management resulting in lowered audit quality. Results show that the auditors which get positive abnormal fees from clients do not want to leave those clients and the benefits of staying with the same client are far more than the costs associated with the audit failure of that client which may result in reputation loss. Thus the study suggests that the independence of auditors is curbed by the abnormal fees, and the auditors getting abnormal fee greater than their expectations (i.e. positive abnormal fee) do not disclose the financial misstatements or earnings management of their client(s).

Lin and Hwang (2010), conducted a meta-analysis of studies conducted regarding audit fee and their impact on audit quality. They say that earnings management has been used as proxy for audit quality in almost all the studies of auditing. Earnings management occurs when manager use their own judgment in financial reporting to alter the financial reports. These alterations done by managers are either meant to mislead the stockholders about the performance of company or to attain personal benefits (which are contingent with the profitability of company). Lin and Hwang (2010), say that the audit quality is multidimensional and unobservable; therefore a single trait or characteristic of auditor can't be the surrogate for the quality of audit conducted. Lin and Hwang (2010), conducted the meta-analysis on 27 studies (till 2006) related to earnings management (audit quality) and audit fee. Their results suggest that high audit fee charged by auditor is negatively related to the quality of audit. This means that high fee charged by auditor impairs his independence and thus the auditor becomes economically dependent upon the client which lowers the quality of audit. Lin and Hwang (2010), say that if the auditor is given fee in commensurate to his efforts then the quality of audit is not lowered. The results of this study, however, cannot be generalized due to the fact that the study was conducted using only 27 studies which are quite less.

Similar kinds of findings are shown by Asthana and Boon (2012), in their study of US market. They explore relationship between abnormal fee and audit quality. Asthana and Boon (2012), say that auditors are hired by clients and compensated by clients for their efforts which creates and economic bonding between client and audit. They say that greater economic bonding between auditor and client degrades audit quality. Asthana and Boon (2012), say that the fact economic bonding undermines audit quality depends upon expected costs and benefits of auditor. Study tests assertion that abnormal fee impairs audit quality. Absolute discretionary accruals is used as proxy for audit quality which is calculated by cross-sectional modified jones model. This study uses 140796 observations and covers a time period of ten years i.e. 2000-2009. Results of the study show that abnormal audit fee impairs audit quality and hypothesis of Asthana and Boon (2012), holds true.

Keeping in view the conflicting evidences regarding (abnormal) audit fee and audit quality, this study will add to literature by providing empirical evidence about relationship of audit fee and audit quality.

3. RESEARCH STRATEGY AND METHODOLOGY

This section discusses the methods and techniques to find out the relationship of auditor fee with audit quality.

3.1 DATA AND SAMPLE SIZE

This study uses secondary data and the companies listed on Karachi Stock Exchange (KSE) 100 index have been included in the study. The reasons for selecting companies from KSE-100 index are that, KSE-100 index is deemed to be the representative of corporate sector of Pakistan and largest stock exchange of Pakistan in terms of market capitalization. Moreover, the study uses amount of audit fee paid by companies and only the companies listed on KSE-100 index are bound to disclose the audit fee in the footnotes of their annual reports (Section 230, Companies Ordinance 1984).The study uses convenient sampling because of data availability issues and only non-financial firms have been used in the study due to the differing asset structure and revenue generation pattern of financial firms. Moreover, audit quality studies rarely include financial companies because those companies do not have necessary data for analysis. The data covers whole sectors of KSE-100 index and at least ten companies should be selected from a single sector otherwise results of cross sectional Modified Jones Model would not be valid (Dechow, 1995).

Additionally, a company is included in the analysis if it meets the following criteria:

- It should have annual reports from the year 2007 to 2011
- It should have disclosed audit fee in all of the years under analysis
- It should have generated sales in all of its years under analysis

On the basis of above criteria and restriction of choosing at least ten companies from single sector, 150 companies from seven sectors were selected for the analysis. Annual reports of each company were retrieved from its website.

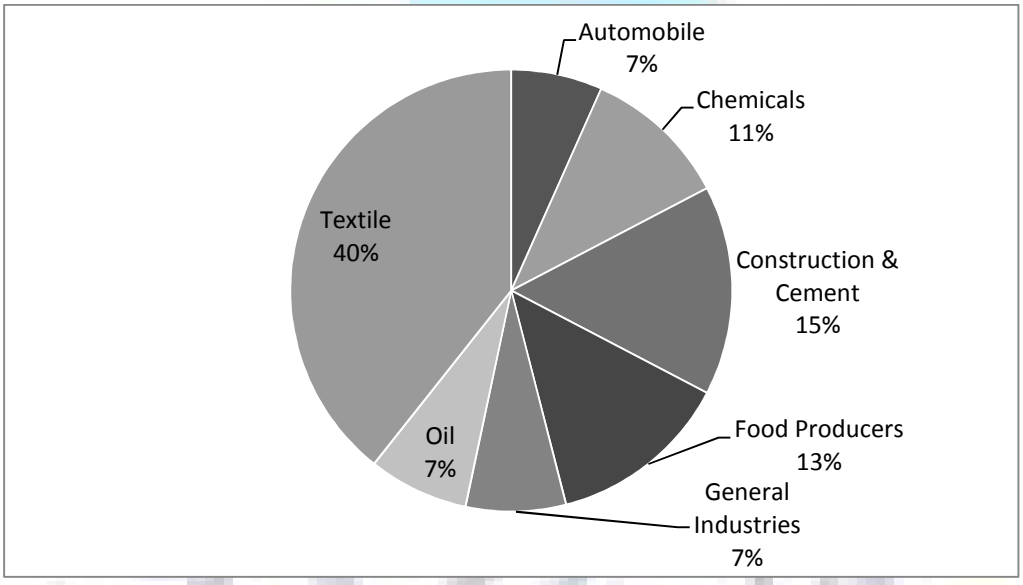
The following table describes the number of companies included in the sample from each sector.

TABLE 3.1: SECTOR WISE SUMMARY OF COMPANIES SELECTED IN THE SAMPLE

S.No	Name of Sector	Number of Companies
1	Automobile	10
2	Chemicals	16
3	Construction & Cement	23
4	Food Producers	20
5	General Industries	11
6	Oil Sector	11
7	Textile	59
	Total	**150**

Number of companies included in the sample from textile sector is highest because this sector has got the highest number of companies among all sectors of KSE-100 index. Following graph displays the proportion of each sector in total sample.

GRAPH 3.1 PROPORTION OF EACH SECTOR IN SAMPLE



3.2 AUDIT QUALITY

3.2.1 MEASUREMENT OF AUDIT QUALITY

This section describes the method and process of finding audit quality. Audit quality is analyzed in context of high payment of audit fee i.e. abnormal audit fee. First the proxy for audit quality is discussed and after that audit quality of auditors is analyzed in context of high audit fee.

Audit quality is an unobservable attribute and therefore, a single characteristic or trait of auditor cannot describe the audit quality (DeAngelo, 1981). Researchers therefore use different proxies for assessing the audit quality. Discretionary accruals are the most common proxy to gauge the audit quality and, therefore this study uses discretionary accruals as proxy for audit quality. Discretionary accruals show the managerial interference into financial reporting process. Moreover, discretionary accruals show the extent to which managers manipulate earnings and therefore disclose the level of earnings management by managers (Choi et al., 2010). Therefore, if the level of discretionary accruals is high then one can say that managers are involved in earnings management. High level of discretionary accruals and earnings management thus reveals that audit quality is low as auditors are unable to find and report the earnings management.

Healy (1985), first used accrual based approach for finding out the earnings management. However, difficulty in this approach is to decompose accruals into managed (discretionary) and unmanaged (non-discretionary) components (Peasnell et al., 2000). The most common method for finding out discretionary accruals is cross-sectional modified Jones model (Dechow, 1995, 2002). It is a precise measure of discretionary accruals and it can decompose accruals into both discretionary and non-discretionary accruals. A study by Peasnell et al. (2000), shows that cross sectional modified Jones model is the most powerful at detecting manipulations than the time-series model.

MODIFIED JONES MODEL

This study uses modified Jones model (Dechow, 1995) with adjustment of performance variable as the performance of a firm results in misspecification (Kothari, 2005).

MODEL 1

$$\frac{\mathbf{TACC}}{\mathbf{TA_{t-1}}} = \alpha\left(\frac{1}{\mathbf{TA_{t-1}}}\right) + \beta_1\left(\frac{\Delta REV - \Delta REC}{TA_{t-1}}\right) + \beta_2\left(\frac{\mathbf{PPE}}{TA_{t-1}}\right) + \beta_3(\mathbf{ROA_{t-1}}) + \varepsilon$$

Where;
TACC = Total Accruals, difference between Earnings (before extraordinary items and discontinued operations) and operating cash flow (OCF).
TA_{t-1} = Total lagged Assets
ΔREV = Change in Revenue from previous year to this year
ΔREC = Change in Receivables from start to end of the year
PPE = Property, plant and equipment
ROA_{t-1} = Lagged Return on Assets which is calculated as net income before extraordinary items of prior period divided by lagged total assets
ε is the error term which indicates the discretionary accruals.
The modified model is designed to reduce the measurement error of discretionary accruals when discretion is applied over sale (Dechow, 1995). This modified version of the Jones model (1991) assumes that all changes in uncollected credit sales at the end of the event period result from earnings management. The reasoning behind this modification is that earnings are easier to manage via credit sales than cash collections.
Discretionary accruals are found by estimating the model by industry year estimation process i.e., the Discretionary accruals of firms from different industry are estimated separately. The estimates from the above equation are used to find out non-discretionary accruals which are then subtracted from total accruals to find out the discretionary accruals. Hence:

MODEL 2

$$\frac{\mathbf{NDACC}}{\mathbf{TA_{t-1}}} = \mathbf{a}\left(\frac{1}{\mathbf{TA_{t-1}}}\right) + b_1\left(\frac{\Delta REV - \Delta REC}{TA_{t-1}}\right) + b_2\left(\frac{\mathbf{PPE}}{TA_{t-1}}\right) + b_3(\mathbf{ROA_{t-1}})$$

Where NDACC is non-discretionary accruals and a, b_1, b_2 and b_3 are estimates of α, β_1, β_2 and β_3 respectively. Non-discretionary accruals for every firm are calculated and then subtracted from total accruals to find out discretionary accruals of that firm.

Total Accruals	=	Discretionary Accruals + Non-Discretionary Accruals
TACC	=	DACC + NDACC
Discretionary Accruals	=	Total Accruals – Non-Discretionary Accruals
DACC	=	TACC – NDACC

The estimation process is cross sectional and Discretionary accruals for each company are estimated separately. In this study absolute discretionary accruals (ABDISC) is used which will capture the effect of both income increasing and income decreasing accruals (Mitra et al, 2009). Absolute discretionary accruals have no sign.
Following table describes about the variables and their definition:

TABLE 3.2: VARIABLES ALONG WITH THE DEFINITIONS (MODIFIED JONES MODEL)

Dependent Variable: TACC **Variable Definition:** Total Accruals, difference between Earnings (before extraordinary items and discontinued operations) and operating cash flow (OCF).	
Independent Variable	**Variable Definition**
ΔREV	Change in Revenue from previous year to current year
ΔREC	Change in Receivables previous year to current year
PPE	Property, plant and equipment
ROA_{t-1}	Lagged Return on Assets, calculated as net income before extraordinary items of prior period divided by lagged total assets
TA_{t-1} =	Total lagged Assets (Previous year assets)

3.2.2 ABNORMAL AUDIT FEE AND AUDIT QUALITY

Abnormal audit fee is the fee paid to auditor above or below his expectations. It can be positive or negative (Choi et al, 2010). The case of abnormal fee arises when auditors feel they are not given audit fee in commensurate with their efforts. Abnormal fee, as described, can have both positive and negative consequences. It can raise the level of audit quality or can impair the audit quality. First the process of finding audit quality is discussed and after that audit quality is analyzed in context of abnormal audit fee.

ABNORMAL AUDIT FEE

Abnormal audit fee is quite simple to calculate and the process is similar to that of absolute discretionary accruals. First, predicted or expected audit fee is found with the help of following model that is used to determine factors of audit fee:

MODEL 3:

$$\mathbf{AFEE} = \propto + \beta_1\mathbf{SIZE} + \beta_2\,\mathbf{INVREC} + \beta_3\,\mathbf{SEG} + \beta_4\,\mathbf{CR} + \beta_5\,\mathbf{ROA} + \beta_6\,\mathbf{LOSS} + \beta_7\,\mathbf{BIG4} + \beta_8\,\mathbf{YEAR} + \beta_9\,\mathbf{MNC} + \varepsilon$$

Where;
∝ = intercept
$AFEE$ = Natural log of audit fees [1]charged by auditor
$Size$ = Natural log of Total assets
INVREC = Inventory plus receivables
SEG = Square root of number of business segments in which the company operates
CR = Liquidity measure (current ratio).
ROA = Return on Assets.
LOSS = Dummy variable for loss. Equal to 1 if firm experienced a loss during the year.
BIG4 = Dummy variable for Big 4 firm. Equal to 1 if the auditing firm is from BIG4
YEAR = Dummy variable for year end. Equal to 1 if the financial year of company ends on 30th June
MNC = Dummy variable for origin of company. Equal to 1 if firm is Multinational company.
ε = Error Term
Following are the steps involved in finding abnormal audit fee:
1. Estimates of equation (from Model 3) which is used for determining audit fee are used to find out predicted or expected audit fee i.e.

[1]Natural log of audit fee and assets is used to linearize the relationship between audit fee and firm size.

$$EAFEE = \alpha + b_1 SIZE + b_2 INVREC + b_3 SEG + b_4 CR + b_5 ROA + b_6 LOSS + b_7 BIG4 + b_8 YEAR + b_9 MNC$$

Where EAFEE is expected audit fee and a, b_1, b_2, b_3, b_4, b_5, b_6, b_7, b_8 and b_9 are estimates of $\propto$, β_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8 and β_9. Unlike, modified Jones model for finding discretionary accruals, the audit fee equation is not estimated separately for every industry rather all are estimated at once.

2. Once estimates are obtained, expected audit fee for every firm is calculated.

3. This estimate is in form of natural log so exponent of value is taken to convert it into rupees form.

4. After that the amount is subtracted from actual audit fee to get abnormal audit fee:

Abnormal Audit Fee = Actual Audit Fee – Expected Audit Fee

The abnormal audit fee can be positive or negative (Choi et al, 2010). If abnormal fee is positive, then auditor considers the actual audit fee above his expectations and efforts. While the negative abnormal fee suggest that auditor expected more than the actual amount paid to him.

AUDIT QUALITY AND ABNORMAL AUDIT FEE

After abnormal fee and discretionary accruals for each firm is found, analysis is made regarding the audit quality in context of abnormal audit fee. Following model is used for finding out the audit quality:

MODEL 4

$$ABDISC = \alpha + \beta_1 ABFEE + \beta_2 BIG\ 4 + \beta_3 \Delta SALES + \beta_4 LEV + \beta_5 LOSS + \beta_6 CFO + \beta_7 SIZE + \varepsilon$$

Where;

ABDISC = Absolute Discretionary Accruals

ABFEE = Abnormal Audit Fee

BIG 4 = Dummy variable for Big 4 firm

ΔSALES = Change in sales from previous year to this year

LEV = Leverage variable

LOSS = Dummy variable for loss

CFO = Cash flow from operations

SIZE = Size of client's business

Absolute Discretionary Accruals (ABDISC) and Abnormal Audit Fee (ABFEE) are described earlier and rest of variables included in the model are control variables which need to be elaborated.

CONTROL VARIABLES

Following are the control variables used in the audit quality model which control for either absolute discretionary accruals or abnormal audit fee:

BIG 4

Research has shown that Big 4 or their affiliated audit firms restrict their clients in earnings management and therefore the true relationship of audit quality may not be observed (Choi et al, 2010). The reason is that Big 4 firms care for their reputation (reputation hypothesis) and therefore they ensure that their client is not engaged in activities that result in manipulation of earnings. Therefore, Big 4 dummy variable has been included in the model to control for such effect and its value equals 1 if the auditing firm is affiliated with Big 4 auditing firms.

Change in Sales ($\Delta Sales$)

Change in sales is calculated as difference in sales of company from previous year to this year. This variable is included to control for earnings management and hence discretionary accruals. Research has shown that growth effects can impact earnings management of a company (Hoitash et al, 2007). Therefore, ΔSALES is used to control for potential growth effect on earnings management.

Leverage (LEV)

Leverage of a company is calculated as total liabilities divided by its total assets. Companies which have high leverage can boost their earnings management (Mitra et al, 2009), and therefore, leverage variable is included to control for such effects.

LOSS

Behaviour of company's manager can change if he foresees loss in his company. He can manipulate earnings either to retain his job and bonuses, or to retain the shareholders of company. He may manipulate accounting figures to show that the company is not in losses and has a bright and viable future. Therefore, it can be said that loss in a company may result in more likelihood of earnings management than a company which is not facing loss. Value of LOSS variable is equal to 1 if the firm faces loss in year of analysis.

CFO (Cash flow from operations)

Kothari et al. (2005), find out that discretionary accruals and firm performance have positive relationship. Therefore, firm performance can impact earnings management or discretionary accruals. CFO (cash flow from operations) variable has been included to control for such effect because cash flow from operations is usually considered as measure of company's performance. Cash flow from operations or operating activities is given in the financial statements of companies.

Size

It has been seen that earnings management is quite low in large firms due to their stability therefore SIZE variable is included and use to control the size effect (Dechow and Delv, 2002). It is calculated by taking natural log of assets. Moreover, firms large in size tend to pay high to auditors and therefore, the level of abnormal fee can surge (Hoitash et al, 2007). SIZE variable therefore controls for both discretionary accruals and abnormal fee.

Following table describes about the variables and their definition:

TABLE 3.3: VARIABLES ALONG WITH THE DEFINITIONS (AUDIT QUALITY AND ABNORMAL AUDIT FEE)

Dependent Variable: ABDISC **Variable Definition:** Absolute discretionary accruals (proxy for audit quality)	
Independent Variable	**Variable Definition**
ABFEE	Abnormal Audit Fee
Control Variables	
BIG 4	Dummy variable for Big 4 firm, equal to 1 if the auditing firm is an affiliate of Big 4 firm
ΔSALES	Change in sales, current year's sales less previous year's sale
LEV	Leverage, calculated by total liabilities over total assets
LOSS	Dummy variable for loss, equal to 1 if the company faces loss in year of analysis
CFO	Cash flow from operations
SIZE	Size of client's business measured by natural log of total assets

If the relationship is negative between absolute discretionary accruals and abnormal audit fee, then it can be concluded that audit quality gets higher when high fee is paid to auditors and they perform more diligently to control for manipulations and earning management. Auditors, therefore care for their reputation and do not compromise on standards (Mitra et al., 2009, Larcker and Richardson, 2004, Choi et al, 2010). While if the relationship is positive between the absolute discretionary accruals and abnormal audit fee, then conclusion can be drawn that the independence of auditors gets curbed by high payment of audit fee and they compromise on their standards and do not care for reputation. They only want to earn profit from audit and do not report misrepresentations of their client in fear of losing a lucrative audit fee (De Angelo, 1981). Audit quality and audit fee relationship is further tested by splitting audit fee into predicted audit

fee (PFEE) and abnormal audit fee (ABFEE). PFEE and ABFEE are components of actual total audit fees, which influence the auditor's economic rationality in the course of planning and executing an audit. Hence, it is appropriate to evaluate the association of both variables with audit fees in the same analysis rather than testing the association of each to the exclusion of the other in the model (Mitra et al, 2009).

3.3 STATEMENT OF HYPOTHESIS

This study will test the following hypothesis:

"There is no relationship between audit quality and abnormal (excess) audit fee"

3.4 ESTIMATION TECHNIQUES

As the study intends to find out the determinants of audit fee and relationship between audit fee and audit quality, so Ordinary Least Square (OLS) estimation method is used for this purpose.Moreover, modified Jones model (Dechow, 1995), used for finding out discretionary accruals, is estimated cross-sectionally because of following reasons:

- In order to use a time series modified Jones model, data of at least seven or ten years is required (Dechow, 2002)
- Due to lengthy time period involved, time-series model can get misspecified due to non-stationarity (Subramanyam, 1996)
- Cross-sectional model enhances sample size
- Cross-sectional modified Jones model is better specified than any other model used for detecting discretionary accruals (Bartov, Gul and Tsui, 2001)

The relationship between audit quality and audit fee is also checked by cross-sectional estimation method. Audit fee model (used for finding out the determinants of audit fee) is estimated on cross-sectional basis to find out abnormal fee for each year. Descriptive statistics are used to describe the variables present in the study.

4. RESULTS AND DISCUSSION

This section explains the statistical analysis and results of OLS estimation. Descriptive statistics are also explained in these sections.

4.1 AUDIT QUALITY

Relationship between absolute discretionary accruals (proxy for audit quality) and audit fee is shown in the table:

TABLE 4.1: OLS RESULTS OF AUDIT QUALITY AND ABNORMAL FEE

Dependent Variable (ABSDISC)										
Indep Variables	**2007**		**2008**		**2009**		**2010**		**2011**	
	β	**p-value**	**β**	**p-value**	**β**	**p-value**	**β**	**p-value**	**β**	**p-value**
Intercept	0.4017	0.0106**	0.2595	0.0279**	-0.0902	0.3345	0.1392	0.1261	0.1358	0.2095
ABFEE	8.23E-08	0.4549	**-1.10E-07**	0.0353**	**-7.91E-08**	0.0163**	1.74E-08	0.3658	7.85E-09	0.6547
SIZE	-0.0154	0.0320**	-0.0097	0.0635	-0.0086	0.0474**	-0.0043	0.3043	-0.0035	0.4797
LEV	0.0085	0.8333	0.0708	0.0318**	-0.0190	0.4885	0.0299	0.1982	0.0123	0.5594
ΔSALES	-6.95E-12	0.3362	2.89E-12	0.2188	-3.78E-12	0.0850	1.65E-12	0.3818	4.58E-13	0.7000
CFO	1.28E-11	0.2059	-2.29E-13	0.9690	-3.91E-12	0.3382	-5.41E-12	0.1612	-4.58E-12	0.2545
BIG4	-0.0376	0.0474**	-0.0141	0.2546	-0.0028	0.7972	-0.0252	0.0231**	-0.0061	0.5861
LOSS	-0.0131	0.4885	-0.0365	0.0050**	-0.0091	0.4334	-0.0224	0.0846	-0.0014	0.9086
R^2	0.069127		0.155440		0.078776		0.076416		0.025967	
Adjusted R^2	0.023239		0.113806		0.033364		0.030888		-0.022049	

*Significant at 1 percent **Significant at 5 percent

Where ABFEE is abnormal fee, SIZE is proxy for client's size of business measured by natural log of assets, LEVERAGE is proportion of leverage in business measured by total debt over total assets, ΔSales is change in sales from previous year to current year, CFO is cash flow from operations, BIG4 is proxy for big 4 firm, LOSS is proxy for loss.

Looking at the OLS results it is observed that, relationship between absolute discretionary accruals and audit fee is significantly negative in year 2008 and 2009. This means that if the auditors are paid high fee they spend extra time and exert extra effort to improve the audit quality (Mitra et al, 2009). The negative relationship means that absolute discretionary accruals get low as fee for auditors are above their expectations. It means that auditors perform their duties with more diligence when they are paid high fee above their expectations and do their best to stop earnings management. This relationship means that auditor's independence is not impaired by high audit fee and therefore, audit quality is not impacted by high audit fee (Larcker and Richardson, 2004).

Further it can be seen from OLS results that variables SIZE and BIG4 (proxies for client's size of business and big4 auditors respectively) show significant negative relationship with absolute discretionary accruals. This shows that businesses or clients which are larger in size reduce or control absolute discretionary accruals and therefore audit quality is high in large businesses (Dechow and Delv, 2002). Moreover negative relationship of BIG4 variable (proxy for big4 firm) with absolute discretionary accruals show that big4 firms also control absolute discretionary accruals and therefore audit quality is high in clients which are audited by big4 firms than the clients which are audited by non-big4 firms (Sun et al., 2011).

The relationship between (abnormal) audit fee and audit quality is further analyzed by splitting audit fee into expected (predicted) and unexpected (abnormal) audit fee. The results of analysis by splitting audit fee into predicted fee and abnormal fee are shown below:

TABLE 4.2: OLS RESULTS OF AUDIT QUALITY AFTER SEGREGATION OF AUDIT FEE

Dependent Variable (ABSDISC)										
Indep Variables	**2007**		**2008**		**2009**		**2010**		**2011**	
	B	**p-value**	**β**	**p-value**	**β**	**p-value**	**β**	**p-value**	**β**	**p-value**
Intercept	0.5570	0.0345**	0.1941	0.2917	-0.1861	0.2647	0.1699	0.2864	0.1818	0.2137
ABFEE	8.38E-08	0.4480	**-1.10E-07**	0.0358**	**-8.24E-08**	0.0135**	1.73E-08	0.3712	6.28E-09	0.7261
PFEE	1.77E-07	0.4600	-5.08E-08	0.6441	-3.94E-08	0.4869	6.89E-09	0.8183	1.05E-08	0.6381
SIZE	-0.0247	0.0892	-0.00597	0.5358	-0.0136	0.1089	-0.0058	0.4587	-0.0058	0.4068
LEV	0.0125	0.7585	0.0681	0.0426**	-0.0149	0.5968	0.0290	0.2215	0.0114	0.5891
ΔSALES	-8.45E-12	0.2614	3.35E-12	0.1907	-3.76E-12	0.0867	1.51E-12	0.4473	9.06E-14	0.9493
CFO	1.00E-11	0.3554	2.64E-13	0.9649	-3.21E-12	0.4460	-5.61E-12	0.1577	-5.41E-12	0.2192
BIG4	-0.0283	0.2145	0.0180	0.2296	0.0076	0.5582	-0.0244	0.0385**	-0.0048	0.6808
LOSS	-0.0062	0.7851	-0.0377	0.0046*	-0.0122	0.3291	-0.0215	0.1171	-0.0014	0.9013
R^2	0.072737		0.156722		0.081940		0.076763		0.027499	
Adjusted R^2	0.020126		0.108876		0.029852		0.024381		-0.027678	

*Significant at 1 percent **Significant at 5 percent level

Where ABFEE is abnormal fee, PFEE is predicted or expected fee, SIZE is proxy for client's size of business measured by natural log of assets, LEVERAGE is proportion of leverage in business measured by total debt over total assets,ΔSales is change in sales from previous year to current year, CFO is cash flow from operations, BIG4 is proxy for big 4 firm, LOSS is proxy for loss.

Results show that even after the segregation of audit fee into expected (predicted) and unexpected component, the unexpected or abnormal audit fee shows a significant negative relationship with absolute discretionary accruals. This shows that auditors do not exert extra effort on the basis of their predicted or expected fee rather they exert extra effort only when paid high above their expectations. They pay back the extra audit fee by working in an effective manner to ensure audit quality is not compromised.

Results support the fact that auditors care for their reputation and do not succumb to lucrative fees given by clients. Therefore, seventh hypothesis is rejected and it can be concluded that auditors in Pakistan care for their reputation and put extra effort to improve audit quality. Thus audit quality is not impaired even if auditors are paid high fee above their expectations.

5. CONCLUSION

This study examines a sample of 150 firms during the period 2007-2011 to explore relationship between audit fee and audit quality in Pakistan. Results indicate audit quality in Pakistan is not a problem when high fee is paid to the auditors as shown by results. The independence of auditors is not curbed by payment of high audit fee and auditors do not compromise on audit quality. In Pakistan, auditors work harder than before and ensure a high quality of audit is done when they are paid extra fee above their expectations. No result show that auditors compromise on audit quality when they are paid high fee than their expectations. The result is further supported by splitting audit fee into normal or predicted audit fee and abnormal audit fee. Therefore, the assertion that auditors compromise their standards when paid extra fee is rejected in Pakistan. Auditors in Pakistan do not compromise on their values for lucrative audit fee and instead they work with more diligence to ensure high quality audit.

This study, however, has certain limitations. The analysis is limited to 150 companies due to the availability of data which may limit in generalization of results. As audit quality cannot be measured with accuracy and therefore no exact proxy exists for measuring audit quality. This research uses discretionary accruals as the proxy for audit quality, so it may not completely reflect the actual audit quality.

Future researchers can focus upon certain issues not addressed in this study. For instance inclusion of corporate governance measures in analysis of audit quality (and audit fee) will lead to a better explanation of audit fee and audit quality. Further, the independence of auditor and its impact on audit quality can be analyzed in depth by segregating audit fee into audit and non-audit fee.

REFERENCES

1. Asthana, S. C., & Boone, J. P. (2012). Abnormal audit fee and audit quality. Auditing: A Journal of Practice & Theory, 31(3), 60-68.
2. Bartov, E. D., Givoly, D., & Hayn, C. (2002). The rewards to meeting or beating earnings expectations. Journal of Accounting and Economics, 33(2), 173-204.
3. Bartov, E., Gul, F. A., & Tsui, J. S. (2001). Discretionary accruals models and audit qualifications. Journal of Accounting and Economics, 30(4), 421-452.
4. Charles, S. L., Glover, S. M., & Sharp, N. Y. (2010). The association between financial reporting risk and audit fees before and after the historic events surrounding SOX. Auditing: A Journal of Practice & Theory, 29(1), 1-15.
5. Chia, Y. M., Lapsley, I., & Lee, H. W. (2007). Choice of auditors and earnings management during the Asian financial crisis. Managerial Auditing Journal, 22(2), 177-196.
6. Choi, J. H., Kim, J. B., & Zang, Y. (2010). Do abnormally high audit fees impair audit quality? Auditing: A Journal of Practice & Theory, 29(2), 115-140.
7. Dart, E. (2011). UK investors' perceptions of auditor independence. The British Accounting Review, 43(3), 173-185.
8. DeAngelo, L. (1981). Auditor independence, low balling and disclosure regulation. Journal of Accounting and Economics, 3(2), 113-127.
9. Dechow, P., & Dichev, I. (2002). The quality of accruals and earnings. The Accounting Review, 77(Supplement), 35-59.
10. Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting earnings management. The Accounting Review, 70(2), 193-225.
11. Gujrati, D. N. (2003). Basic Econometrics. New York: McGraw-Hill Inc.
12. Hoitash, R., Markelevich, A., & Barragato, C. A. (2007). Auditor fees and audit quality. Managerial Auditing Journal, 22(8), 761-786.
13. Jones, J. (1991). Earnings management during import relief investigations. Journal of Accounting Research, 29(3), 193-228.
14. Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accrual measures. Journal of Accounting and Economics, 39(1), 163-197.
15. Kraub, P., Pronobis, P., & Zulch, H. (2011). Do audit fee premiums trigger error announcements and earnings management? European Accounting Association-34th Annual Congress. Rome.
16. Larcker, D. F., & Richardson, S. A. (2004). Fees paid to audit firms, accrual choices and corporate governance. Journal of Accounting Research, 42(3), 625-58.
17. Lin, J. W., & Hwang, M. I. (2010). Audit quality, corporate governance, and earnings management: A meta-analysis. International Journal of Auditing, 14(1), 57-77.
18. Lin, Y., Lin, C., & Liu, C. (2008). The impact of SOX on audit pricing: audit risk and compliance risk. Working Paper Series. National Cheng University.
19. Michas, P. N. (2011). The importance of audit profession development in emerging economies. The Accounting Review, 86(5), 1731-1764.
20. Mitra, S. D., Deis, R., & Hossain, M. (2009). The association between audit fees and reported earnings quality in pre and post-Sarbanes-Oxley regimes. Review of Accounting and Finance, 8(3), 232-252.
21. Naser, K., & Nuseibeh, R. (2007). Determinants of audit fees: emprirical evidence from an emerging economy. International Journal of Commerce & Management, 17(3), 239-254.
22. Neimi, L. (2002). Do firms pay for audit risk? Evidence on risk premiums in audit fees after direct control for audit effort. International Journal of Auditing, 6(1), 37-51.
23. Peasnell, K., Pope, P., & Young, S. (2000). Detecting earnings management using cross-sectional discretionary accrual models. Working Paper Series. Lancaster University.
24. Schelleman, C., & Knechel, W. R. (2010). Short-term accruals and the pricing and production of audit services. Auditing: A Journal of Practice & Theory, 29(1), 221-250.
25. Seetharaman, A., Gul, F. A., & Lynn, S. G. (2002). Litigation risk and audit fees: evidence from UK firm cross-listed on US markets. Journal of Accounting and Economics, 33(1), 91-115.
26. Simon, D., & Taylor, M. H. (1997). The market for audit services in Pakistan. Advances in International Accounting, 10(4), 87-101.
27. Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. Journal of Accounting Research, 22(3), 161-190.
28. Subramanyam, K. R. (1996). The pricing of discretionary accruals. Journal of Accounting and Economics, 22(8), 249-282.
29. Sun, J., & Liu, G. (2011). Client-specific litigation risk and audit quality differentiation. Managerial Auditing Journal, 26(4), 300-316.

DETERMINANTS OF NON-PERFORMING LOANS IN NIGERIA

ISRAEL ODION EBOSETALE IDEWELE
RESEARCH ASSISTANT
DEPARTMENT OF BUSINESS ADMINISTRATION
CYPRUS INTERNATIONAL UNIVERSITY
TURKEY

ABSTRACT

The study examines the determinants of nonperforming loans in Nigeria. Secondary data were extracted from the Central Bank of Nigeria Statistical Bulletin and the Annual Reports of all commercial banks. The study employs an ordinary least square multiple regression analysis given that the data are cross – sectional and time series in nature. The cross – section random effect model was employed and the estimate parameter data were regressed and analyzed with the aid of EVIEWS 7.0 econometric software package. The findings of the study are that, the Gross Domestic Product is not a significant determinant of bad debt ratio, and poor credit risk management contributes significantly to non – performing loans in the Nigerian banking sector. We therefore insistently recommend that, Nigerian government should establish positive banking regulations that would contribute to oversee the administration of loans, and banks should adopts efficient loan appraisal techniques consisting of conventional investment analysis and risk measurements.

KEYWORDS

Financial Institution, loans, Non-performing loans, Commercial Banks, Poor Credit Management, Microeconomic variables, lending portfolio.

1. INTRODUCTION

The financial institutions generally serve as financial intermediaries. This form of asset intermediation is required to ensure that the funds are transferred from the surplus economic units to deficit economic units within the economy. The Nigerian banking sector encourages individuals and organizations to establish themselves by approving credit and loans to them and also ensuring that organizations which buy goods or services on credit, or individuals who borrow money, can afford to do so and that they pay their debt on time. "Non-performing loans are define as loans which, for a relatively long period of time, do not generate income, that is, the principal and/or interest on the loans has been unpaid for at least 90 days." (Lario and Klingebiel, 1999). The incidence of non-performing loans (NPLs) could occur when due, resulting in over-bloated loan interest due for payments.

Poor credit management and non-Performing loans (NPLs) reduce the liquidity of banks, and credit expansion, this would relatively slow down the growth of the real sector with direct consequences on the performance of the banks, the firm and the economy as a whole. Lending involves the creation and management of credit assets and is an important task in bank management. This is so because the lending portfolio requires articulated lending policy. The policy should set out the bank's lending philosophy and objectives including the modalities for implementation, monitoring, appraisal and review. Well-conceived lending policies and careful lending practices are essential in efficient credit system and in minimizing the risk in lending.

The banking sector seem to have an important role to play in the economic development of the country. However, the previous studies on the sector indicates that little success was recorded in this regard. Some banks find it difficult to deal with the obligation to their customers and owners due to faults or weakness in managing their lending portfolio and the short comings which could render them either illiquid or insolvent. Most banks in Nigeria in the past have been saddled with problems relating to loans and advances particularly credit management and non-performing loans (NPLs) which have gradually eroded their profits and their performances have been greatly retarded. The ability of banks to recover loans and advances granted to customers constitutes a major factor in the bank's failure. This unhealthy phenomenon has greatly retarded economic growth and development in the state. We seek to achieve three main objectives;

To examine the extent to which poor credit management by Nigerian banks have contributed to determinants of non-performing loans,

To determine the impact of macroeconomic performance of Nigerian economy on the prevalence of non-performing loans in Nigeria.

To examine the impact of banks composition of board of directors on non-performing loans in Nigerian banks.

2. LITERATURE REVIEW

The focus of this section is to review literature on Non-performing loans which would serve as a basis of understanding how it would result in banks and the economy of a country.

NON-PERFORMING LOANS

Non-performing loans (NPLs) generally refer to the loans which for a relatively long period of time do not generate income. That is the principal and \or interest on loans has remained unpaid for at least 90 days (Caprio and Ktingebiel 1999). Deserving and Renault, (2004) submitted that non-performing loans (NPLs) has taken a new dimension in finance just as interest rate and asset and liability management were, 15 years ago because of mounting pressure of non-performing loans (NPLs) on bank's balance sheets and incessant banks failure. It is the intention of every lender or credit analyst to make only good loans but inevitably, occasional oversight occurs. In some cases unexpected incident may happen that will disrupt the good plans already laid down.When a loan is to default there are often warning signals, which if perceived early should stimulate the lenders curiosity to take necessary action to safeguard the bank's interest. Causes of non-performing loans (NPLs) can broadly be grouped into the following: Adverse economic conditions or problems, Bank related problems, Customers' related problems and Political condition/problems. Employment and income are closely affected by lack of payment which may place the borrowers in a position of not being able to repay. Some consumed loans may also couse problems due to poor budgeting by the borrower such as their unforeseen contingencies which are in excess of income. Some banks related problems are the causes of non-performing loans (NPLs) such as: Poor management, Lack of sound credit policy,Inadequate credit analysis,Error in documentation,Undue emphasis on profitability at the expense of loan quality. Fraudulent practices,Abnormal competition – Kassim (2002).

Muller (2001) is of the opinion that though banks earn profit by taking risks, they can minimize this risk to some extent by adopting good lending policies, identifying the risk involved, meaning and cleaning, situation of the venture to prevent bad lending. He further stated that banks are lending area in which business risks are known and the spirit of just creating new business should not plunge the bank into serious debts management problems. According to him, most causes of non-performing loans are usually the consequences of violation of lending policies and market speculation. Alegbe (2004) brought forward the opinion that security perfection is the only prudent practice since customers are over willing to co-operate before disbursement, but becomes extremely difficult once disbursement has been allowed. He therefore warned bank managers to ensure that the security requirement should be fully garented before a customer is allowed to draw down approved facility. He believes that with the collusion of the staff or through inefficient book keeping, the bank will not be able to press for repay.

CREDIT RISK MANAGEMENT

The amount of debt that is definitely known to be irrecoverable must be written off as bad debts. Bad debts are regarded as an expense in earning the revenue of that accounting period and must be debited to the profit and loss account on balance sheet day. Provision for bad debts might be an income statement account also known as bad debt expenses or uncollectable account expenses.

MACROECONOMICS VARIABLES

GDP and inflation are the some microeconomic variables used in this study. The total market value of all final goods services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports. In economics, inflation is a rise in the general level of price of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods services. Negative effects of inflation include a decrease in the real value of money and other monetary items over time. Examining the macroeconomic factors that contribute to banking crises in Latin America during the 1990s, Gavin found that interest rates, inflation, terms of trade, domestic income, credit growth and exchange rate regime are important constraints on loan servicing capacity. Typically, these studies found that loan loss provisions are negatively related to GDP growth and positively related to interest rate.

COMPOSITIONS OF BOARD OF DIRECTORS

Choe and Lee (2003), states that board composition is very important to effectively monitor the managers and reduce the agency cost. Although the executive directors have specialized skills, expertise and valuable knowledge of the firms' operating policies and day-to-day activities, there is a need for the independent directors to contribute the fresh ideas, independence, objectivity and expertise gained from their own fields (Weir, 1997; Firth et al., 2002). Hence, the agency theory recommends the involvement of independent non-executive directors to monitor any self-interested actions by managers and to minimize agency costs (Kiel & Nicholson 2003; Le et al. 2006; Florackis & Ozkan, 2004; Williams et al. 2006).

Secondly, the success of the banks brings out the ability of the banks to identify the types of financial products demanded by the public and to provide the products efficiently and sell them at a competitive price. The bank's efficiency is given attention by the management since it will help banks to enhance the chance of survival in the competitive markets (Ihsan & M.Kabir, 2002). Moreover, customers sometimes are fraudulent, they give false information about their business dispose of collateral securities without the knowledge of the lender, and also go into endless litigations with the bank to buy time or even abscond without a leading or forwarding address.

EMPIRICAL EVIDENCE ON THE EFFECT OF NON-PERFORMING LOANS ON BANKS PERFORMANCE IN SOME COUNTRIES

Empirical evidence and result from similar studies shows the negative effects of non-performing loans on banks performances. Current global financial crisis attest these direction.

In Turkey, Karabulut and Bilgin (2007) carried out a study with the purpose of examining the impact of the unlimited deposit insurance on non-performing loans of (NPLs) and market discipline. They argued that deposit insurance program plays a crucial role in achieving financial stability. Government in many advanced and developing economies established deposit insurance scheme for reducing the risk of systematic failure of banks. The report shows that deposit insurance has a beneficial effect of reducing the probability of a banking operation. However, deposit insurance systems have their own set of problems. Deposit insurance creates moral hazard incentive that encourages banks to take excessive risks.

Turkey established and explicit deposit insurance system in 1960. Until 1994 the coverage was determined by a flat rate but during that time period, Turkey was experiencing a major economic crisis. In April 1994, Turkey government has to establish an unlimited deposit insurance scheme to restore the banking system stability. In conclusion, the study shows that unlimited deposit insurance causes a remarkable increase of non-performing bank loans (NPLs). What this means is that deposit insurance institutions established by monetary authority must re-examine the current policy of blanket guarantee of deposits in the banking sector.

In Taiwan, Hu Li and Chu (2004) carried out their own study examining how ownership structure affects non-performing loans (NPLs). Their findings revealed that an increase in the government shareholding facilitate political lobbying. On the other hand, private shareholding induces more on non-performing loans (NPLs) to be manipulated by corrupt private owners. The result shows that the rate of NPLs decreased as the ratio of NPLs among Taiwanese public, mixed and private commercial banks.

RECENT HAPPENINGS IN THE BANKING SECTOR AS A RESULTS OF NON-PERFORMING LOANS

Nigerian banking is facing a crisis and pragmatic steps must be taken to arrest the ugly situation. Central Bank of Nigeria (CBN), not too long ago announced the dismissal of managing directors of five banks in Nigeria intercontinental Bank, Fin Bank, Corner Stone, Oceanic Bank and Afribank. Apart from that, many influential individuals and companies were fingered not keeping up to agreements of the debts they owed to those banks. The reason given by Sansi Lamido's CBN for letting them go is principally due to excessively high level of non-performing loans in the five banks which was attributed to poor corporate financial practices, tax credit administrator process and the absence or non adherence to the bank's credit risk management practices. Thus, the percentage of non-performing loans to total range from 19% to 48%. The five banks will therefore need to make additional provision of N539,09 billion. The huge provision requirements have led to significant capital impairment. consequently; all the banks are undercapitalized for their current level of operations and are required to increase their provisions for loan losses, which impacted negatively on their capital. Indeed one is technically insolvent with a capital adequacy ratio of 1.0%. Thus, a minimum capital injection of N204.94 billion will be required in the five banks to meet the minimum capital adequacy ratio of 10%. Credit was given to the capitalization of banks at the time of #25 billion that was initiated by Prof. Charle Soludo, the former Governor of CBN.

In the third quarter of 2006, the banks magazine, an arm of the financial times group released its world renowned top 1,000 world banks ranking for 2006 and on the list were size Nigeria banks; First Bank, Union Bank and Oceanic Bank. According to the magazine the increase in the number of Nigeria banks in this global listing is 1000 "due to the consolidation that has taken place in the banking sector in Nigeria since 1st January 2006 and the creation of larger banking institutions with a minimum capital requirement of N25 billion.

HYPOTHESES

There are three formulated Hypothesis for this studies. And they are as follows;

Hypothesis 1: Poor Credit management does not contribute significantly to non-performing loan in Nigeria banking sector

Hypothesis 2: Macroeconomic variables do not contribute significantly to non-performing loans in Nigeria banking sector.

Hypothesis 3: Compositions of boards of director do not contribute significantly to non-performing loans in Nigeria banking sector.

3. METHODOLOGY

The aim of this study is to examine the determinants of non-performing loan in Nigeria. The study covers commercial banks in Nigeria, Secondary data collection method was adopted in this study. Data were collected on the dependent and independent variables for the period under review (1980-2010). The research is both analytical and descriptive. It is analytical in the sense that data supplied by the sample banks were analyzed to determine their individual debt capacities and descriptive in the existing attitudes and practices concerning non performing loan and comparisons were measured. Population of this study consists of all Nigeria commercial banks that operate in the sector from 1980 – 2010.

Secondary data are used in this study. It was used to agree with their methodology which uses historical records and survey studies because there is no way research into the past events would be carried out without relying on secondary sources. Similarly, it serves as a source of reference for further research.

As indicated from above, secondary data were sourced from existing records and published reports. The data for this study were extracted from the audited statement of accounts and annual reports (1980 – 2010) of all commercial banks to generate the data to be used for the analysis. Also various reports and brochure of Nigerian Deposit insurance Corporation (NDU) were sourced, CBN statistical bulletin were used in this study. Some selected corporate reports of bank were helpful.

Augmented Dickey Fuller (ADF) tests will be used for the analysis. This study examines credit risk management in Nigeria commercial banks. It explore the long run and short term relationship between the dependent variable, bad debt ratio (BDR), (our proxy for credit risk) and some independent variable – total deposits (TO), bank capital base (BCAP), total loans (TL), board independence (BIR), provision for bad debt (PBD), interest rate (INTR), gross domestic product (GDP) and total non-performing loans (TNL). The study covers existing commercial/merchant banks in Nigeria during the period under review. The study period was thirty-one years (1980 – 2010).The pooled data were analyzed using multiple regression analysis. The functional form of our regression model is:

BDR = F (TD, BCAP, TL, BIR, PBD, INTR, INFL, GDP, TNL

Econometric form of our regression model is:

$BDR = \alpha_0 + \alpha_1 TD + \alpha_2 LNBCAP + \alpha_3 LNTL + \alpha_4 BIR + \alpha_5 PBD + \alpha_6 INTR + \alpha_7 INFL + \alpha_8 GDP + \alpha_9 TNL + e$

Where: $\alpha_0 - \alpha_9$ = Coefficients

BDR = Bad debt ratio (our proxy for credit risk)
TD = Total deposits
LNBCAP =Natural Logarithm of Bank capital base
LNTL = Natural Logarithm of Total Loans
BIR = Board independence
PBD = Provision for bad debt
INTR = Interest rate
INFL = Inflation
GDP = Gross domestic product
TNL = Total non-performing loans
e = Error term

4. DATA ANALYSIS AND RESULT INTERPRETATION

This study examined credit risk management in Nigerian commercial banks. First, to reduce the effects of large numbers and to make the slope coefficient to be measures of elasticity of the dependent variable with respect to the independent variables, we took the natural logarithms of some of the variables - total deposits (LNTD), bank capital (LNBCAP), and total loans (LNTL) - with large number in their series. To determine the order of integration and to avoid spurious regression, we conducted the unit roots tests to test the null hypothesis that the series have unit roots. Using the Augmented Dickey-Fuller (ADF) tests at 95% level of significance, the results show that all the variables were not stationary at levels (because the ADF test statistic was lower, in some instances, than the ADF critical values at 95% level of significance).

Details of the tests are contained in Table 4.1a.

TABLE 4.1A: UNIT ROOTS TEST FOR VARIABLES AT LEVELS

VARIABLE	ADF TEST STATISTIC	ADF CRITICAL VALUE @ 95%	REMARK
BDR	-4.9030	-2.9640	STATIONARY
LNTD	0.1517	-2.9678	NON-STATIONARY
LNBCAP	-0.8921	-2.9678	NON-STATIONARY
LNTL	-1.7835	-2.9640	NON-STATIONARY
BIR	-3.8182	-2.9640	STATIONARY
PBD	-2.5356	-2.9640	NON-STATIONARY
INTR	-4.3953	-2.940	STATIONARY
INFL	-2.6020	-2.9640	NON-STATIONARY
GDP	-3.7865	-2.9640	STATIONARY
TNL	-1.6189	-2.9640	NON-STATIONARY

As shown above, all the variables were not stationary at levels. Thus, to ensure the analysis is conducted at the same order of integration we transformed the series to their first difference and thereafter repeated the unit root tests on the first difference values.

TABLE 4.1B: UNIT ROOT TEST FOR VARIABLES AT THEIR FIRST DIFFERENCES

VARIABLE	ADF TEST STATISTIC	ADF CRITICAL VALUE @ 95%	STATUS	ORDER OF INTEGRATION
DBDR	-3.7368	-2.9981	STATIONARY	I(1)
DLNTD	-7.3977	-2.9763	STATIONARY	I(1)
DLNBCAP	-14.9519	-2.9719	STATIONARY	I(1)
DLNTL	-4.9342	-2.9862	STATIONARY	I(1)
DBIR	-7.8031	-2.9763	STATIONARY	I(1)
DPBD	-8.5044	-2.9719	STATIONARY	I(1)
DINTR	-10.1437	-2.9763	STATIONARY	I(1)
DINFL	-5.1881	-2.9862	STATIONARY	I(1)
DGDP	-5.3390	-2.9919	STATIONARY	I(1)
DTNL	-5.0949	-2.9810	STATIONARY	I(1)

In Table 4.1b above, it indicates that in each of the variable in the data series, the ADF test statistic is greater than the 95% ADF critical value.This was an indication that they were stationary at their first difference and thus are integrated of order one, I(1).

Thus, we rejected the hypothesis of the existence of unit roots (non-stationarity) for the data series. Thus, the variables are stationary at their first difference and they are integrated of order one [I(1)]. Therefore, the regression analysis on the transformed data would produce non-spurious results. To test for co-integration we employed the Engle and Granger two-stage technique.

DETERMINATION OF LONGRUNS OR EQUILIBRIUM RELATIONSHIP

Co-integration helps to determine the long run or equilibrium relationship between the dependent and independent variables. Towards this end, first, we conducted an ordinary least square (OLS) regression analysis (i.e. we regressedBDR on the independent variables) and thereafter, we extracted the regression residuals and we performed the unit roots test on them.

Table 4.2 shows the OLS regression results:

TABLE 4.2: ORDINARY LEAST SQUARES MULTIPLE REGRESSION ANALYSIS

Dependent Variable BDR	Variables	Coefficient	t-statistic	Probability
	C	2.0138	1.3261	0.1991
	LNTD	0.2218	2.0355	0.0546**
	LNBCAP	-0.1742	-1.5619	0.1333
	LNTL	-0.4411	-3.2057	0.0042*
	BIR	3.4562	1.6097	0.1224
	PBD	-1.53E-06	-0.2131	0.8333
	INTR	-0.0056	-0.2738	0.7869
	INFL	0.0090	1.5216	0.1430
	GDP	-0.0024	-0.0718	0.9434
	TNL	1.00E-05	3.2817	0.0036*
R^2	0.53			
Adj. R^2	0.32			
F-statistic	2.64			
Pro (F-statistic)	0.032	DW=1.88		

Source: Data analysis by Researcher, January, 2013

When we performed a unit root test on the residuals obtained from the above regression at level, to test the null hypothesis that ECM has a unit root against the alternate hypothesis that ECM has no unit root. The test produced the following results in Table 4.3 below.

TABLE 4.3: AUGMENTED DICKEY-FULLER UNIT ROOTS TEST ON ECM

ADF TEST STATISTIC	TEST CRITICAL VALUES AT 95%	REMARKS
-4.5891	-2.9763	STATIONARY

From the above table, it can be seen that the ADF test statistic, -4.5891 is greater than the 5% critical value of -2.9763 (absolute values).This indicates that the regression residuals are stationary and that the relationship between the dependent variable and independent variables are co-integrated and has long or equilibrium relationship. Thus, a long run or stable relationship exists between the dependent variable, bad debt ratio (BDR) (our proxy for credit risk), and the independent variables –total deposits (TD), bank capital (BCAP), total loans (TL), board independence (BIR), provision for bad debt (PBD), interest rate (INTR), inflation(INFL), gross domestic product (GDP) and total non-performing loans (TNL).

SHORT RUN DYNAMICS RELATIONSHIPS

The error correction mechanism (ECM) initially used by Sargon (1984) and popularized by Engle and Granger (1987) corrects the long run or equilibrium relationship for disequilibrium. According to the Granger representation theorem, where two variables are co-integrated, the relationship between the two can be expressed as ECM. Thus, the ECM framework shows the temporary behavior of the dependent variable given short run changes in the independent variables. In this analysis, the autoregressive distributed lags (ARDL) approach was used in estimating the ECM. The results are contained in Table 4.4 below. The adjusted R-squared criterion and information criteria (Akaike info criterion, Schwarz criterion and the Hannan-Quinn criteria) were used in selecting the parsimonious model from the over-parameterized models that is reported in the table. To check for autocorrelation, the Durbin Watson statistic was also used in conjunction with other criteria in selecting the best model from many over parameterized ECM models. The absolute value of the ECM(-1) parameter determines how quickly the equilibrium is restored given temporary shocks in long run relationships.

As shown in Table 4.4 below, the results of the factors that have impact on credit risk (proxied in this study by bad debt ratio, BIR)in the Nigerian banking industry show that the goodness of fit statistic of the model is very high. The adjusted R-squared value is 0.86, an indication that over 86% of the systematic variation in credit risk (BIR)is accounted for by variations in the explanatory variables including changes in the error correction term. Given that F-statistic,12.45, passes the significant test at 1% [Prob (F-stat) =0.0000] level, this is a strong indication that the ECM model has a strong predictive power. Thus, we reject the null hypothesis of no significant log linear relationship between bad debt ratio (our proxy for credit risk) and all the independent variables. Therefore, we conclude that a significant log linear relationship exists between credit risk (proxied by bad debt ratio) and the independent variables.

TABLE 4.4 ARDL REPRESENTATION OF THE ERROR CORRECTION MECHANISM BASED ON THE ADJUSTED R-SQUARED CRITERION

Dependent Variable: DBDR	Variables	Coefficient	t-statistic	Probability
	DLNTD(-1)	-0.0413	-0.3963	0.6983
	DLNBCAP(-1)	0.1184	1.4655	0.1665
	DLNTL	-0.7999	-6.0126	0.0000*
	DLNTL(-1)	0.0410	0.4144	0.6853
	DBIR	1.0399	0.6599	0.5208
	DBIR(-1)	-1.4977	-1.1938	0.2539
	DPBD	-1.40E-06	-0.3626	0.7227
	DPBD(-1)	1.74E-05	3.2666	0.0061*
	DINTR	-0.0084	-0.6218	0.5448
	DINTR(-1)	-0.0226	-1.3901	0.1879
	DINFL(-1)	0.0035	0.6716	0.5136
	DGDP	0.0091	0.2971	0.7711
	DTNL	1.16E-06	0.4990	0.6261
	DTNL(-1)	7.83E-06	2.1895	0.0474**
	ECM(-1)	-0.7434	-3.1192	0.0081
R^2	0.93			
Adj. R^2	0.86			
F-statistic	12.45			
Pro (F-statistic)	0.0000	DW=1.83		

Source: Data analysis by Researcher, January, 2013

*significant at 1% level; ** significant at 5% level

From the above table, it is observed that the current year value of total loans(DLNTL) has a negative but significant impact at the 1% level on credit risk (DBDR) while the impact of the one-year lag is not significant. Similarly, previous year provision for bad debt (DPBD(-1))significantly impact on credit risk also at the 1% level of significance. Meanwhile although the impact of current year non-performing loans (DTNL) on credit risk is not significant, however, the previous year level of total non-performing loans (DTNL(-1)) has negative but statistically significant impact on credit risk.

Other variables in the model including board independence (BIR), interest rate (DINTR) , inflation rate (INFL), gross domestic product (DGDP) and bank capital base have no statistically significant impact on credit risk. Thus, this study indicates that board independence (BIR), interest rate (DINTR), inflation rate (INFL), gross domestic product (DGDP) and bank capital base (BCAP) are not significant determinants of credit risk in Nigeria.

LONG AND SHORT RUN RELATIONSHIPS

Therefore, there exists a long run stable relationship between credit risk (proxied by bad debt ratio) and the independent variables. Indeed, the long run relationships between credit risk and total deposits on the one hand, and credit risk and total loans on the other, are significant with t-values of 2.04 and -3.21 respectively. Similarly, long run relationship exists between credit risk and total non-performing loans. However, in the short run the relationships between the credit risk and total loans, credit risk and previous year provision for bad debt are statistically significant. In the same vein, although the long run relationship between credit risk and the current year total non-performing loans are not significant, but in the short run the previous year impact on credit risk is statistically significant at 5% level. In the short run, any shock or deviation in the long run equilibrium values of these variables is speedily restored to equilibrium level at the rate of 74% given that the ECM coefficient is -0.74.The parsimonious ECM model's adjusted R-squared value of -0.74 clearly shows that the model has strong predictive power. The Durbin Watson statistic of 1.70 indicates the absence of autocorrelation in the time series data. Therefore, we conclude that the results of the regression analyses and the coefficients of the models are reliable and should be very useful in prediction and for policy direction.

5. FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 FINDINGS

This study examined credit management and the determinants of non-performing loans in Nigeria banking industry. It ascertained the impact of credit management on bank lending performance in Nigeria by examining the long run stable and short-term dynamic relationships between the dependent variable – bad debt ratio (BDR) (our proxy for credit risk) and the independent variables – total deposit (TD), bank capital base (BCAP), total loans (TL), board independence (BIR), provision for bad debt (PBD), interest rate (INTR), inflation (INFL), gross domestic product (GDP) and total non-performing loans (TNL). The study covered a period of thirty one years (1980 – 2010).

The major findings of the study are as follows:

- Gross Domestic Product is not a significant determinant of credit risk.
- Total loans and advances significantly impact credit risk.
- Total non-performing loans have significant impact on credit risk.
- Poor credit management contributed significantly to non-performing loans in the Nigerian banking sector.
- Other macro-economic variables (inflation and interest rate) do not contribute significantly to non-performing loans in the Nigerian banking sector.
- Board independence does not significantly have any impact on the level of credit risk.

However, on the short run dynamic relationships, the following findings were revealed:

- The current year value of total loans (DLNTL) has a negative but significant impact at the 1% level on credit risk (DBDR) while the impact of the one-year lag is not significant.
- Similarly, previous year provision for bad debt (DPBD(-1) significantly impact on credit risk, also at the 1% level of significance. Meanwhile although the impact of current year non-performing loans (DTNL) on credit risk is not significant,
- The previous year level of total non-performing loans (DTNL(-1)) has negative but statistically significant impact on credit risk.

Other variables in the model including board independence (BIR), interest rate (DINTR), and inflation rate (INFL), gross domestic product (GDP) and bank capital base have no statistically significant impact on credit risk. Thus, this study indicated that board independence (BIR), interest rate (DINTR) inflation rate (INFL), gross domestic product (DGDP) and bank capital base (BCAP) are not significant determinant of credit risk in Nigeria.

5.2 CONCLUSION

In conclusion, bank management should pay greater attention to bank lending activities so as to minimize the incidence of bank debts in the industry. Since the relationship indicators and bad debt ratio are not statistical significant, the Nigerian banks should do all within their power to ascertain that the credit worthy customers and other corporate bodies are given loans instead of outrightly depriving them access to loans in order to enhance the economic development of the country in no time. The level of credit management by Nigerian banks should be significantly improved upon to avoid or reduce the incidence of non performing loans.

5.3 RECOMMENDATIONS

In relation to our findings, the following recommendations are suggested:

- The Nigerian government should put in place some banking regulations that would help oversee effective administration of loans.
- The managers of the Nigerian banks from time to time should carry out seminars with their employees on the subject of "credit management" in order to thoroughly educate the workers.
- Banks should endeavor to establish an enduring loan recovery mechanism and the various loan recovery strategies be well employed to recoup all non-performing loans.
- Banks should adopt an Efficient Loan Appraisal Techniques (ELAT) consisting of conventional investment analysis and risk measurement
- Adequate provisions for non-performing loans so as not to distort the true presentation of the bank position in their balance sheets as well as sound credit analysis.
- The banks should endeavour to diversify their investment credit portfolio, Such investment should cut across three categories of loan, viz: short term, medium and long term.
- The institution of bank credit strategy that will take into account the cyclical aspect of economy and shifts in the composition and quantity of credit portfolio.

REFERENCES

1. Abolo, E.M. (1999) General lending principles and policies First Bank of Nigeria *monthly Business and Economic report*, September, 2009.
2. Afripol: Central Bank of Nigeria Needs to Reform the Banking system Aug. 25, 2009 www.afripol.org.
3. Agbolo, E.M. (1999). General lending principles and policies: First Bank of Nigeria monthly Business Economic report, September.
4. Agbonifoh, B. A. & Yomere, G.O. (1999). *Research methodology in the Social Sciences and Education.* Uniben Press. Benin City, Nigeria.
5. Akhtar, M., Ali, K., & Sadaq, S. (2010). Performance efficiency of commercial banks of Pakistan: Non-parametric technique Data Envelopment Analysis (DEA), *Asian Journal of Business and Management Sciences*, Vol. 1, No. 2, 150-156.
6. Akmal, M., & Saleem, M. (2008). Technical efficiency of the banking sector in Pakistan. SEP Research Bulletin, 4CD, 61-30.
7. Alegbe, V. I. (2004). Introduction to Banking System, Brothers (Nigeria) Publishers, Ibadan.
8. Alkhathlan, K., & Malik, S.A. (2010). Are Saudi banks efficient? Evidence using data envelopment analysis (DEA). *International Journal of Economics and Finance,* Vol. 2(2), 53-58.
9. Alo, V.O. (1995). Advances-Issues and Problems. The Stallion Magazine. Vol. 38.
10. Arun, T. & Turner, J. (2004). Corporate Governance of Banks in Developing Economies: Concept and Issues, Corporate Governance: An International Review, 12(3). 3710377.
11. Ataullah, A. & L.E. (2006). Economic reforms and banks efficiency in developing Countries: The case of Indian banking industry. *Applied Financial Economics*, 16, 653-663

12. Banks Deteriorating NPAs concern : Pranab Murkherjee,Jan. 6 2012
13. Basel Committee on Banking Supervision (2003), "The New Basel Capital Accord", Consultative Document, April.
14. Basel Committee on Banking Supervision (2005) "Principles for the management of credit risk", September.
15. Caprio, G. & Klingebiel, D. (2002). Episodes of systemic and borderine financial crisis. The World Bank (unpublished).
16. CBN Prudential Regulation of Nigeria Banking, The Nigeria Bankers. May – August 1990 (Published).
17. Engle, R. F. & Granger, C. W. (1987). Co-integration and error correction: Representation, estimation and testing. *Econometrica*, 55, 251-276.
18. Hu, J.Y. & Chu, Y. (2004). Ownership and Non-performing loans: Evidence from Taiwan's Banks" The Development Countries, XLII-3, pg 405-420.
19. Karabulut, G. & Bilgin, M.H. (2007). Source of non-performing loan in Turkish banking system" *Journal of Bus and Econ Research*, 5, (10).
20. Nwankwo, G.O. (1991) Risk Analysis and Management, Principles and Practice Malt House Press Ltd. Lagos.
21. Sargon, J. D. (1984). *Wages and prices in the United Kingdom: A study in econometric methodology*. In K. F. Wallis and D. F. Hendry (eds.). Quantitative Economics and Econometric Analysis, Oxford, U.K.: Basil Blackwell.
22. Somoye, R.O.C (2010), The variation of Risks on Non- performing loan on Bank Performances in Nigeria. India Journal of Economics and Business. vol.9.
23. Somoye, R.O.C. (2008) .The Performance of Commercial Banks in Post Consolidation Period in Nigeria: An Empirical Review. *Global Academy of Business and Economic Research*, 2008, International Conference, Orlando, September, 17-19

INVESTORS PERCEPTION ON MUTUAL FUNDS AT NELLORE DISTRICT

CHILLAKURU ESWARAMMA
RESEARCH SCHOLAR
DEPARTMENT OF MANAGEMENT STUDIES
S. V. UNIVERSITY
TIRUPATI

ABSTRACT

The mutual fund is the most suitable investment for the common man as it offers an opportunity to invest in a diversified, professionally managed basket of securities at a relatively low cost. The plethora of schemes provides variety of options to suit the individual objectives whatever their age, financial position, risk tolerance and return expectations. In the past few years, we had seen a dramatic growth of the Indian Mutual Fund industry with many private players bringing global expertise to the industry. Investment in mutual funds is effected by the perception of the investors. The objectives of the study are to identify the small investor's perceptions on mutual funds and to analyse the factors affecting small investors' perception towards mutual fund. The study aims at finding out the attitude of the small investors towards investment in mutual funds in Nellore. By adopting convenience sampling, 200 sample respondents were selected for this study. Simple statistical tools are used for analysing the data whatsoever collected in this study. Small investors are now turning more to mutual funds because of safety, liquidity, capital gains and transparency. The present investigation outlined that mostly the small investors have positive approach towards investing in mutual funds.

KEYWORDS
Demographic Factors, Mutual Funds, Perception of investors.

JEL CLASSIFICATION
G11, G12

INTRODUCTION

Mutual fund is suitable for the common man as it offers an opportunity to invest and diversified, professionally managed basket of securities comparatively at low cost. The investors pool their money to the fund manager and the fund manager invest the money in the securities and after generating returns passed back to the investors. "Mutual fund is a pool of money is invested in accordance with the common objective stated before the investment to the investors." The SEBI regulations 1993 defines a mutual fund as " a fund in the form of trust by a sponsor, to raise money by the trustees through the sale of units to the public, unser one or more schemes, for investing in securities in accordance with these regulations" Mutual funds offers several advantages over investment in single stocks, including diversification and professional management. A mutual fund can hold investments in number of stocks, thus reducing the risk associated with any particular stock. Moreover, the transaction cost associated with buying and selling.

REVIEW OF LITERATURE

Lenard et., al. (2003) empirically investigated investor's attitudes toward mutual funds. The results indicate that the decision to switch funds within a fund family is affected by investor's attitude towards risk, current asset allocation, investment losses, investment mix, capital base of the fund age, initial fund performance, investment mix, fund and portfolio diversification. The study reported that these factors are crucial to be considered before switching funds regardless of whether they invest in non-employer plans or in both employer and non-employer plans.

Bollen (2006) studied the dynamics of investor fund flows in a sample of socially screened equity mutual funds and compared the relation between annual fund flows & lagged performance in SR funds to the same relation in a matched sample of conventional funds. The result revealed that the extra-financial SR attribute serves to dampen the rate at which SR investors trade mutual funds. The study noted that the differences between SR funds and their conventional counterparts are robust over time and persist as funds age. The study found that the preferences of SR investors may be represented by conditional multi-attribute utility function (especially when SR funds deliver positive returns). The study remarked that mutual fund companies can expect SR investors to be more loyal than investors in ordinary funds.

Walia and Kiran (2009) studied investor's risk and return perception towards mutual funds. The study examined investor's perception towards risk involved in mutual funds, return from mutual funds in comparison to other financial avenues, transparency and disclosure practices. The study investigated problems of investors encountered with due to unprofessional services of mutual funds. The study found that majority of individual investors doesn't consider mutual funds as highly risky investment. In fact on a ranking scale it is considered to be on higher side when compared with other financial avenues. The study also reported that significant relationship of interdependence exists between income level of investors and their perception for investment returns from mutual funds investment.

Saini et., al. (2011) analyzed investor's behavior, investors' opinion and perception relating to various issues like type of mutual fund scheme, its objective, role of financial advisors / brokers, sources of information, deficiencies in the provision of services, investors' opinion relating to factors that attract them to invest in mutual and challenges before the Indian mutual fund industry etc. The study found that investors seek for liquidity, simplicity in offer documents, online trading, regular updates through SMS and stringent follow up of provisions laid by AMFI.

Singh (2012) conducted an empirical study of Indian investors and observed that most of the respondents do not have much awareness about the various function of mutual funds and they are bit confused regarding investment in mutual funds. The study found that some demographic factors like gender, income and level of education have their significant impact over the attitude towards mutual funds. On the contrary age and occupation have not been found influencing the investor's attitude. The study noticed that return potential and liquidity have been perceived to be most lucrative benefits of investment in mutual funds and the same are followed by flexibility, transparency and affordability.

NEED FOR THE STUDY

Indian Mutual Fund (IMF) industry provides reasonable options for an ordinary man to invest in the share market. Financial markets are constantly becoming more efficient by providing more promising solutions to the investors. As of now big challenge for the MF industry is to mount on investor awareness and to spread further to the semi-urban and rural areas. These initiatives would help towards making the IMF industry more vibrant and competitive. Therefore a need is there to study investor's perception regarding the MFs. In this context, the need of study has been aroused in order to see the preference, awareness and the investors' perception regarding the MFs. The study at first tests whether there is any relation between demographic profile of the investor and MFs and the factors that influences the selection of MF schemes. For the purpose of analysis perceptions of selected small investors are taken into consideration.

OBJECTIVES

1. To study the attitude of investors(categorize and selected demographically) towards investment in mutual funds

2. To identify the opinion among demographic groups on attitude towards investment
3. To identify the objectivity of investment among demographic groups

HYPOTHESIS

1. There is significant difference in opinion among Demographic groups on attitude towards Investment
2. There is significant difference in Objectivity of Investment among Demographic Group

RESEARCH METHODOLOGY

The research design for the study is descriptive in nature. The researcher collected primary data from the investors living in Nellore and invested in MF schemes during the period between August to November, 2014 through a structured questionnaire. The sample size covered 200 small investors of Nellore . In order to collect referred information from the investors, the sampling design was carefully decided and properly chosen for the study. From the selected area, ten approved brokers of were chosen and contact the investors with the help of brokers. Thus, this study was based on the responses by 200 selected respondents. To analyse the primary data simple statistical tools like percentage method, cross tabulation and Chi-Square analysis were used.

ANALYSIS

DIFFERENCE IN OPINION OF VARIOUS DEMOGRAPHIC GROUPS ON ATTITUDE TOWARD INVESTMENT

H1 ***There is significant difference in opinion among Demographic groups on attitude towards Investment.*** To analyze the difference in attitude of Investment among various Demographic groups, Independent sample t-test is employed. In this statistical analysis the attitude toward investment is considered as test variable and each Demographic factor is considered as grouping variable. The results of attitudinal difference are collected by employing each demographic variable separately. The results of independent sample t-test are summarized in the following table.

TABLE 1: DIFFERENCE IN OPINION OF VARIOUS DEMOGRAPHIC GROUPS ON ATTITUDE TOWARD INVESTMENT

Demographic Factors	Investment Objective	Willingness to Take Risk
Age	9.387	13.652**
Gender	12.5*	15.42**
Occupation	35.76**	27.303**
Education	14.49*	18.20**
Marital Status	9.485	4.854
Monthly Income	19.054*	28.55**
Monthly Savings	28.603**	7.408

*significant at 0.05 level

**significant at 0.00 level

It is observed that there is insignificant difference in attitude towards investment objective among age groups (t= 9.38, p > 0.05) and there is significant difference in attitude pertaining to Willingness to take Risk (t= 13.65, p < 0.00). Further it is observed that there is significant difference in attitude towards Investment Objective (t = 12.5, p < 0.05) and Willingness to take Risk (t = 15.42, p < 0.00) among men and women.

It is observed that there is significant difference in attitude towards Investment Objective (t = 35.6, p < 0.00) and Willingness to take Risk (t = 27.3, p < 0.00) among occupational groups. Further it is observed that there is significant difference in attitude towards Investment Objective (t = 14.4, p < 0.05) and Willingness to take Risk (t = 18.2, p < 0.00) among educational groups.

The analysis states from the above table states that there is insignificant difference in attitude towards Investment Objective (t = 9.4, p > 0.05) and Willingness to take Risk (t = 4.8, p > 0.05) among marital status groups. Further it is observed that there is significant difference in attitude towards Investment Objective (t = 19.05, p < 0.05) and Willingness to take Risk (t = 28.55 , p < 0.00) among income groups. It is also observed that there is significant difference in attitude towards Investment Objective (t = 28.60, p < 0.00) and insignificant difference in attitude toward Willingness to take Risk (t = 7.408, p < 0.00).

It can be concluded from the above table that Gender, Occupation, Education and Monthly Income groups have difference in attitude towards investment and the rest are partially have difference in opinion. Hence the H1 can be partially accepted.

DIFFERENCE IN OPINION READING THE OBJECTIVITY OF INVESTMENT AMONG DEMOGRAPHIC GROUPS

H2 ***There is significant difference in Objectivity of Investment among Demographic Group.*** The analysis difference in objectivity can be analyzed by employing Chi-Square test. The objectivity of investment can be Return, Stability, Marketability and Tax Benefit. The each objectivity is again sub-categorized into three is considered as test variable. Demographic factors and its sub groups are considered as grouping variable. The results are been summarized as the following table.

TABLE 2: DIFFERENCE IN OPINION READING THE OBJECTIVITY OF INVESTMENT AMONG DEMOGRAPHIC GROUPS

Demographic Factors	Return	Stability	Marketability	Tax Benefit
Age	3.74	20.58**	8.49	7.323
Gender	4.31	2.76	0.736	1.478
Occupation	9.78	11.50	7.71	20.37**
Education	5.81	16.38**	1.35	13.82**
Marital Status	6.92	10.01	8.45**	16.83**
Monthly Income	14.93**	3.08	10.54**	5.66
Monthly Savings	4.55	7.63	7.22	9.08

*significant at 0.05 level

**significant at 0.00 level

It is observed that Monthly Income (Z=14.9, p <0.00) groups have difference in opinion on Returns of Mutual Fund and the rest demographic variables are indifferent in opinion. Further Groups of Age (Z = 20.58, p < 0.00) and Education (Z = 16.38, p<0.00) have difference in objectivity of Stability.

Furthermore, Marital Status (Z= 8.45, p < 0.00) and Monthly Income (Z= 10.54, p< 0.00) groups have difference in opinion regarding Marketability. Occupation (Z= 20.37, p< 0.00), Education (Z= 13.82, p< 0.00) and Marital Status (Z= 16.83, p< 0.00) groups have difference in objectivity of Tax Benefit.

The rest of demographic variables have insignificant difference in opinion on various objectivity of investment pertaining to Return, Stability, Marketability and Tax Benefit. Hence it can be concluded that H2 is partially accepted.

INVESTORS PREFERENCE OF FINANCIAL ASSETS

Investors invest their money in various investment instruments to satisfy their different needs. The investment in various avenues determines the risk taken by the investor and amount of return he could earn. Hence this section explains the preference of Financial Assets of the investor. The results of the preferences are been detailed in Table 3.

TABLE 3: INVESTORS PREFERENCE OF FINANCIAL ASSETS

Financial Assets	Order of Preference						Total Score	Avg Score	Rank
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6			
Bank Deposits	84	84	12	12	6	2	1022	5.11	1
P.O Saving Schemes	26	52	54	38	14	16	790	3.95	2
Bonds and Debentures	40	18	64	46	24	8	780	3.90	3
Equity Shares	32	26	22	62	22	36	676	3.38	6
Mutual Funds	18	52	32	30	54	14	708	3.54	5
Insurance Policies	56	28	24	18	22	52	722	3.61	4
Others		2	8				42	0.21	7

The above table explains the frequencies obtained and weights assigned to each Financial Asset along with Total Score, Average Score and Rank. It can be observed the investors preferred Bank Deposits at the first instance as the investment avenue average score of 5.11.The second preference made by the investor Postal Office Schemes with a average score of 3.95. The investors preferred the other Financial Assets in order of Bonds and Debentures, Insurance Policies, Mutual Funds, Equity Shares and Other Financial Assets respectively.

PREFERENCE OF MUTUAL FUNDS

The Mutual fund Industry is categorized as follows Bank Sponsored Mutual Fund, Institution Sponsored Mutual Fund, Private – Indian Mutual Fund, Private Joint Venture (Predominantly Indian) and Private Joint Venture (Predominantly Foreign). The following section explains the preference of Investors in various sectors of Mutual Funds.

TABLE 4: PREFERENCE OF MUTUAL FUNDS

Type of Mutual Fund (Sector)	Order of Preference					Total Score	Avg Score	Rank
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5			
Bank Sponsored MF	102	58	18	16	6	834	4.17	1
Institution Sponsored MF	38	72	44	28	18	684	3.42	2
Private –Indian MF	26	48	62	50	14	622	3.11	3
Private Joint Venture (Predominantly) Indian	16	34	54	70	26	544	2.72	4
Private Joint Venture (Predominantly) Foreign	42	19	25	46	68	521	2.605	5

It is observed from the above table that investors prefer Bank Sponsored Mutual Funds for the first instance and followed by Private – Indian Mutual Fund, Private Joint Venture (Predominantly Indian) and Private Joint Venture (Predominantly Foreign) in order.

PREFERENCE OF FUND OBJECTIVE

The Mutual Fund industry provides various schemes based on the investment policy. The following table lists the type of mutual funds based on schemes. The Investors are open to opt any of the mutual fund and a scheme. This section details about the preference of the investors in various schemes. The following table lists various schemes, frequencies, total score and average score of each scheme. Further the table gives ranking based on the average score

TABLE 5: PREFERENCE OF FUND OBJECTIVE

Type of Mutual Fund (Fund Objective)	Preference of Fund Objective						Total Score	Avg Score	Rank
	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6			
Growth	78	46	20	22	24	10	902	4.51	1
Income	32	72	40	30	14	12	842	4.21	2
Balanced	38	40	54	36	24	8	808	4.04	3
ELSS	28	22	46	40	32	32	678	3.39	5
Money Market	22	42	24	72	30	10	724	3.62	4
Gilt	52	24	14	26	28	56	678	3.39	6

FACTORS INFLUENCE IN CHOICE OF MUTUAL FUNDS

The following table summarizes the opinion on significant factors that determine the choice of Mutual Funds. The table consists of list of parameters considered in choice of Mutual funds, further respective Weighted Mean Scores and Skewness. It is observed from the analysis of data that Goodwill of the institution serving the Mutual fund in the most critical factor with an Weighted Mean Score of 4.01 is considered by the investor in choice of Mutual Fund. Sector, Investment Philosophy and Methodology, Volume of Business, Experience, Investor Services, Past Performance, Infrastructure and suggestions in order were perceived as the influential factors in choice of Mutual fund.

TABLE 6: FACTORS INFLUENCE IN CHOICE OF MUTUAL FUND

SL. No	Parameters	Investor	
		Weighted Mean	Skewness
1	Goodwill	4.01	-0.9
2	Volume of business	3.11	-0.2
3	Sector represented	3.42	-0.6
4	Investor services	2.97	0.0
5	Past performance	2.94	-0.0
6	Infrastructure	2.92	-0.0
7	Suggestions (friends, relatives etc)	2.73	0.2
8	Background Experience	2.98	0.0
9	Investment Philosophy & Methodology	3.24	-0.1
10	Others	3.01	-0.7

IMPORTANT FACTORS IN SELECTION OF MUTUAL FUND

In the previous section we have observed the general factors initially observed in choice of Mutual Funds. In the following section we observe the technical parameters considered while making choice of Mutual Fund. The table summarizes the list of technical parameters and its respective Weighted Mean score and Skewness. It is observed from the table Return on Investment is the critical factor in selection of Mutual fund with a Weighted Mean Score of 3.95.

Safety, Objective of Fund Capital Appreciation, Convenience of Reinvestment, Liquidity, Loan Facility and Fund Managers background in order are perceived as important factors in selection in Mutual Funds.

TABLE 7: IMPORTANT FACTORS IN SELECTION OF MUTUAL FUND

SL. No	Parameters	Investor	
		Weighted Mean	Skewness
1	Capital Appreciation	3.65	-0.7
2	Objective of the fund	3.67	-0.7
3	Return on Investment	3.95	-1.2
4	Tax benefit	2.64	0.3
5	Liquidity	3.14	-0.1
6	Safety	3.93	-1.3
7	Loan facility	2.94	0.1
8	Convenience of reinvestment	3.16	-0.2
9	Fund Managers Background	2.73	0.3
10	Others	-	-

DEGREE OF SATISFACTION

The investor's opinion regarding the Mutual Fund Industry Performance, Investment Opportunities and Industry are summarized in the following table. It is observed that the investors are satisfied with Industry performance with a Weighted Mean Score of 3.51, Investment Opportunities in Mutual Fund Industry with an Weighted Mean Score of 3.29 and Services to Investors by Mutual Funds with a Weighted Mean Score of 3.26.

TABLE 8: DEGREE OF SATISFACTION

SL. No	Parameters	Investor	
		Weighted Mean	Skewness
1	Mutual Fund Industry performance	3.51	-0.7
2	Investment opportunities in M F Industry	3.29	-0.3
3	Services to Investors by Mutual Funds	3.26	-0.2

CONCLUSION

It is concluded that the MFs business in Nellore is still in an embryonic stage. So, concerted efforts are needed for its success. The success depend upon high returns, professional competence of Fund Managers, a MF brings together a group of people and invests their money in stocks, bonds and other securities, it have so many advantages such as professional management, economics of scale. The MF should be easy to buy and sell through broker or directly in the market. It also has some draw backs such as low awareness, too many formalities, difficult to select. Finally, the MF should be great transparency, prudent accounting norms, less transaction cost, low management fees. It is very attractive between sub urban and rural areas, it have innovative schemes and efficient administrative system. The present study analyses the MF investments in relation to investor's behaviour. Investors' opinion and perception has been studied relating to various issues like Difference in Opinion of various Demographic groups on Attitude toward Investment, Difference in Opinion reading the Objectivity of investment among Demographic Groups, Investors Preference of Financial Assets, Investors Preference on Mutual Funds, Fund Objectives, Factors in influence of Mutual Funds, Degree of Satisfaction,etc.

This study is very important in order to judge the investors' behaviour in a market like India, where the competition increases day by day due to the entry of large number of players with different financial strengths and strategies. The present investigation outlined that mostly the investors have positive approach towards investing in MF. MFs have emerged as an important segment of financial markets and so far have delivered value to the investors. The study reveals that the investors' perception is dependent on the demographic profile and assesses that the investor's age, marital status and occupation has direct impact on the investors' choice of investment. The study further reveals that female segment is not fully tapped and even there is low target on higher income group people. Hence, fund managers should take steps to tap the female segment and higher income group segment to enhance more investment in MF investment avenue which would really help the industry to flourish. Further, the findings of the research were on the factors influencing investor's perception on public private MF's. It reveals that liquidity, flexibility, tax savings, service quality and transparency etc. are the factors which have a higher impact on perception of investors. These factors give them the required boosting in the investment process. Therefore, it becomes imperative on part of the fund managers to enhance these features for attracting more investors and also to retain the trust, the investors have in them.

REFERENCES

1. Agapova, Anna (2011), "The Role of Money Market Mutual Funds in Mutual Fund Families", *Journal of Applied Finance*, Vol. 21, No. 1, 87-102.
2. Agarwal, Vikas; Boyson, Nicole M.; Naik, Narayan Y. (2009), "Hedge Funds for Retail Investors? An Examination of Hedged Mutual Fund", *Journal of Financial & Quantitative Analysis*, Vol. 44, No. 2, 273-305.
3. AMFI (2009), "Financial Markets Review", Financial Technologies Management Company, India. Retrieved from: http://www. google.com.(accessed on 22nd May 2010)
4. Anand, S. and Murugaiah,V. (2004), "Marketing of Financial Services: Strategic Issues", *SCMS Journal of Indian Management*, Vol. July-September, No.3, 41-53.
5. Arun (2006), "The Indian Stock Exchange BSE / NSE Profit from It", AMFI, December 28. Retrieved from: http://www. google.com.(accessed on 10th May 2010)
6. Badla, B S., and Garg, A. (2007), "Performance of Mutual Funds in India – An Empirical Study of Growth Schemes", *GITAM Journal of Management*, Vo1. 5, No.4, 29-43.
7. Badrinath, S.G & Gubellini, S. (2011), "On the characteristics and performance of longshort, market-neutral and bear mutual funds", *Journal of Banking & Finance*, Vol. 35, No. 7, 1762-1776.
8. Cao, Charles; Ghysels, Eric & Hatheway, Frank (2011), "Derivatives do affect mutual fund returns: Evidence from the financial crisis of 1998", *Journal of Futures Markets*, Vol. 31, No. 7, 629-658.
9. Chen, Feng; Kraft, Arthur; Weiss, Ira (2011), "Tax Planning by Mutual Funds: Evidence from Changes in the Capital Gains Tax Rate", National Tax Journal, Vol. 64, No. 1, 105-34.
10. Desigan et al. (2006), "Women Investor's Perception towards Investment: An empirical Study", *Indian Journal of Marketing*. Retrieved from: http://www. google.com. (accessed on 22nd May 2010)
11. Gil-Bazo, Javier; Ruiz & Verd, Pablo (2009), "The Relation between Price and Performance in the Mutual Fund Industry", *Journal of Finance,* Vol. 64, No. 5, 2153-2183.
12. Jambodekar, Madhusudan V. (1996), Marketing Strategies of Mutual Funds – Current Practices and Future Directions, Working Paper, UTI – IIMB Centre for Capital Markets Education and Research, Bangalore.
13. King, J.S. (2002), "Mutual Funds: Investment of Choice for Individual Investors?" *Review of Business*, Vol.23, No.3, 35-39.
14. Manjesh, S and Reddy (2005), "Money Market Mutual Funds (MMMFs): A Macro Perspective", *Portfolio Organizer*, Vol. August, 41-56.
15. Noronha, M.R. (2007), "Performance Evaluation of Equity Based Mutual Funds: A Case Study of Three Asset management Companies in India", *The Management Accountant,* Vol. July, 527-534.

16. Rajeswari, T.R., and Ramamoorthy, V.E. (2001), "An Empirical Study on Factors Influencing the Mutual Fund/Scheme Selection by S mall Investors". Retrieved from: http://www.utiicm .com/Cmc/PDFs/ 2001/rajeswari.pdf. (accessed on 12th May 2009)
17. Ramamurthy, B. M. and Reddy, S. (2005), "Recent Trends in Mutual Fund Industry", 18. Ranganathan, Kavitha (2006), "A Study of Fund Selection Behaviour of Individual Investors towards Mutual Fund", Phd Thesis, Madurai Kamaraj University.
18. Saraswathi, T. S. (2006), "Mutual Fund in India", *Front Line*, 28th December. Retrieved from: http://www. google.com. (accessed on 12th May, 2009)
19. Sikidar, Sujit and Singh, Amrit Pal (1996), "Financial Services: Investment in Equity and Mutual Funds – A Behavioural Study", in Bhatia B.S., and Batra G.S.(ed.) Management of Financial Services, Deep and Deep Publications, New Delhi, 136-145.

WATERMARKING METHOD IN DIGITAL IMAGE USING PRIVATE KEY

HARJOT KAUR
STUDENT
LUDHIANA COLLEGE OF ENGINEERING & TECHNOLOGY
KATANI KALAN

MANISHA LUMB
ASST. PROFESSOR
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
LUDHIANA COLLEGE OF ENGINEERING & TECHNOLOGY
KATANI KALAN

ABSTRACT

According to the paper watermarking used to hide data or identifying information. Watermarking may be applied at digital images, through digital video, audio and documents are also routinely watermarked. Digital watermarking is become popular for adding undetectable identifying marks, such as author or copyright information. The technique can hide an entire image or pattern as a watermark directly into the original image. The quality of image is to be preserved the entire image is not altered for embedding, instead few blocks are used based on the size of watermark. Watermark is tested with Lena grey scale image of size 256×256and watermark of size 64×64 using mat lab software. Watermarking System based on Discrete Cosine Transform (DCT) and Discrete Wavelet Transform (DWT) which is used to protect the security and integrity of transmitted biometric color images. Data hiding method based on interpolation which calculates the interpolation error and the residual histogram of the interpolation errors of the host image to hide secret data. The residual image is obtained by interpolation and histogram shifting is applied to obtain the watermarked image. Entropy masking model for watermarking embedding algorithm to keep the balance between watermarks imperceptibility and its robustness.

KEYWORDS

Digital watermarking, Transform domain watermarking, entropy based watermarking , Discrete Cosine Transform (DCT), Discrete Wavelet Transform (DWT), Data hiding interpolation, image histogram.

INTRODUCTION

Technology rising day by day, similarly modern life increases the use of computer technology day by day. These systems should be both a fast response these expectations and this process must be reliable. However, security applications are exposed to many serious attacks. To overcome the problem, other than as usual tried to develop new security systems. To provide a safer and an biometric identification system provides advanced solutions. The general physical and behavioral features used biometric are given below.

1. Facial features 2. Ocular features 3. Fingerprint 4. Hand 5. Audio features 6. Handwriting and signature

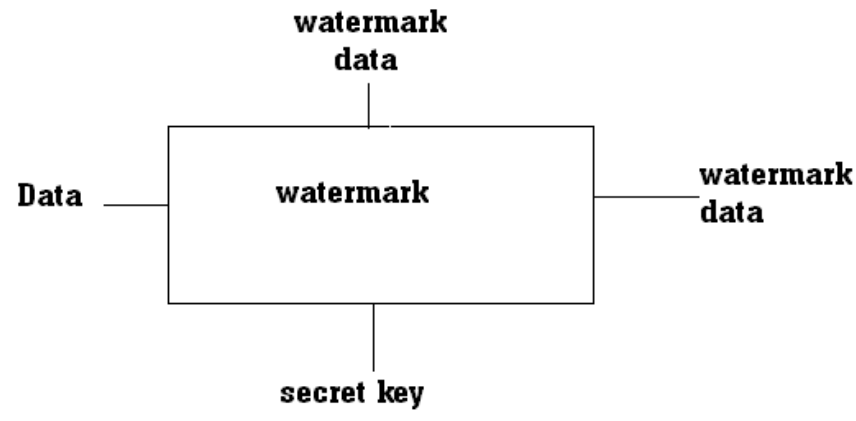
Biometric systems such as face recognition, fingerprint recognition, speech recognition, etc.,

The new method to hiding data, to improve security is watermarking. Digital data that may be picture, audio or video. The embedding takes place by manipulating the content of the digital data, which means the information is not embedded in the frame around the data. The hiding process has to be such that the modifications of the media are imperceptible. The most important features of watermarking method are

1.Reliability 2.Invisibility 3.High capacity

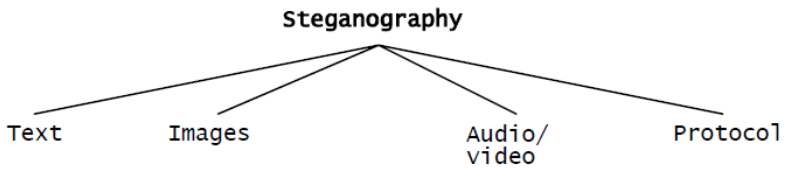
THE BASIC BLOCK DIAGRAM OF WATERMARKING METHOD IS GIVEN BELOW:

FIG 1



Digital watermarking of multimedia content has become a very active research[5].Digital watermarking techniques derive from steganography, which means covered writing. Steganography is the science of communicating information while hiding the existence of the communication. The goal of steganography is to hide an information message inside harmless messages in such a way that it is not possible even to detect that there is a secret message present. Both steganography and watermarking belong to a category of information hiding, but the objectives and conditions for the two techniques are just the opposite[1]. In spatial domain, the watermark is embedded directly by modifying the intensity values of pixels. In frequency domain, the watermark is embedded by changing the frequency coefficients. To transform image into frequency domain, the transformation techniques such as (DWT), (DCT), discrete Hadamard transformation and discrete Fourier transformation are used. Spatial domain watermarking technique is easier and its computing speed is high, than transform domain watermarking.

FIG. 2



HADAMARD TRANSFORM

The Hadamard transform is a non-sinusoidal, orthogonal transformation that decomposes a signal into a set of orthogonal, rectangular waveforms. The transformation has no multipliers has only two values +1 or -1

The transformation process is carried out on 8×8 blocks:

FIG. 3

$$\begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \\ 1 & -1 & -1 & -1 & -1 & -1 & -1 & -1 \end{bmatrix}$$

ENTROPY: Entropy defined as

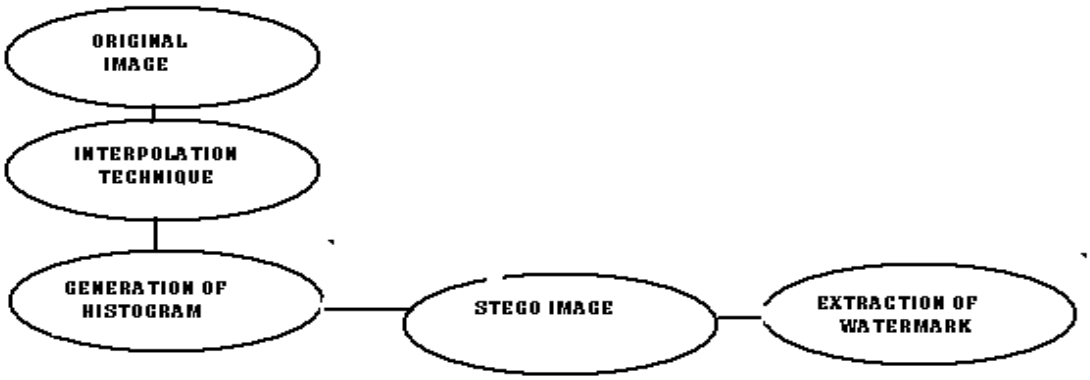
$E= -\sum h \log2 (h)$

Let h contains the histogram counts[2].

Watermarking Using Interpolation and Histogram Shifting :This method only modifies the interpolation error values slightly; the stego image quality is often higher than that of expansion-embedding-based techniques. Besides, the capacity is larger than those histogram-shifting based techniques because the peak of the interpolation error histogram is often higher than that of the original image histogram.

BASIC BLOCK DIAGRAM FOR WATERMARKING

FIG. 4

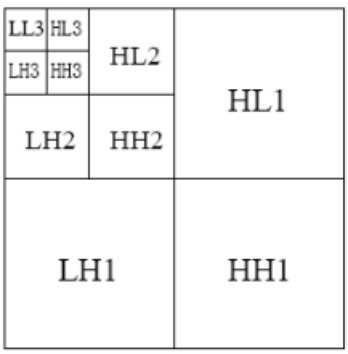


The histogram shifting embedding procedure, firstly the pair of peak and zero points from the image histogram is searched. The peak point is the pixel value with maximum occurrences in the histogram. The zero point is the one with zero or minimum occurrences in the histogram. Pixels with their values ranging from the peak point to the zero point have to be modified for this technique. By contrast, pixels with values outside the range are not changed. The rule for pixel modification is based on the location of pixels in the image histogram [3].

DCT and DWT: Discrete Fourier transform(DFT), DCT turn over the image edge to make the image transformed into the form of even function. It's one of the most common linear transformations in digital signal process technology. Wavelet transform is a time domain localized analysis method with the window's size fixed and form convertible. There is quite good time differentiated rate in high frequency part of signals DWT transformed. Also there is quite good frequency differentiated rate in its low frequency part. It can distill the information from signal Effectively.

DWT DECOMPOSED MAP

FIG. 5



Here, L represents low-pass filter, H represents high-pass filter. An original image can be decomposed of frequency districts of HL1, LH1, HH1. The low-frequency district information also can be decomposed into sub-level frequency district information of LL2, HL2, LH2 and HH2. By doing this the original image can be decomposed for n level wavelet transformation. The information of low frequency district is a image close to the original image. Most signal information of original image is in this frequency district. The frequency districts of LH, HL and HH respectively represents the level detail[4].

METHODOLOGY

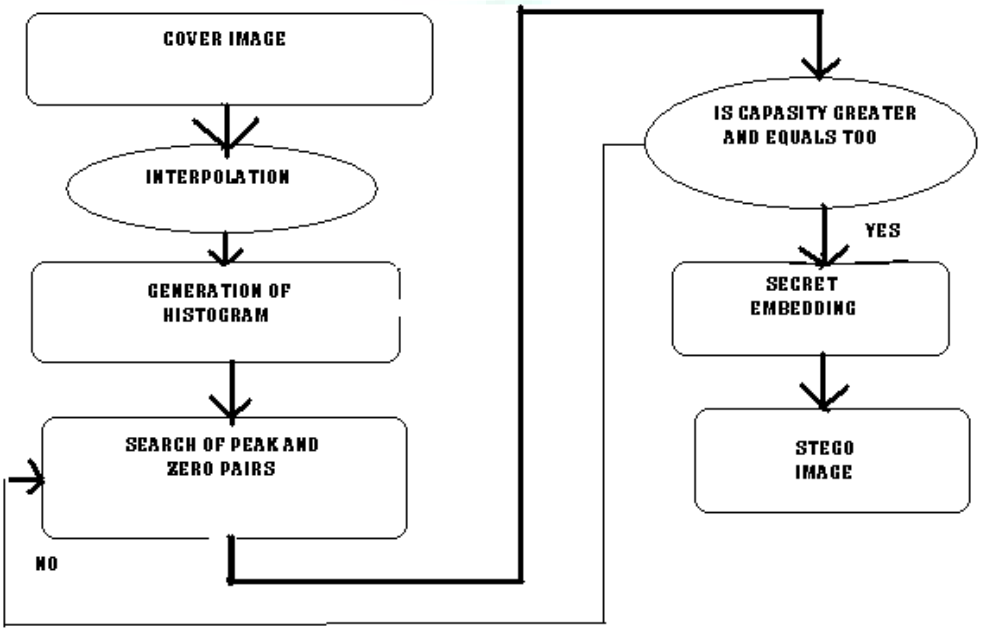
The Hadamard transformation technique and entropy concepts are used, here input image is divided into many blocks and entropy is calculated for each block. If the information content is very high then those blocks are marked as primer blocks for embedding watermark [2].

DWT digital watermark algorithm based on human vision characters. By using the block technology, watermarking signal is embedded into the high frequency band of wavelet transformation domain. And before embedding this watermark image has been DCT in order to improve its robustness [4].

EMBEDDING PROCESS

FLOW CHART OF DIGITAL WATERMARKING

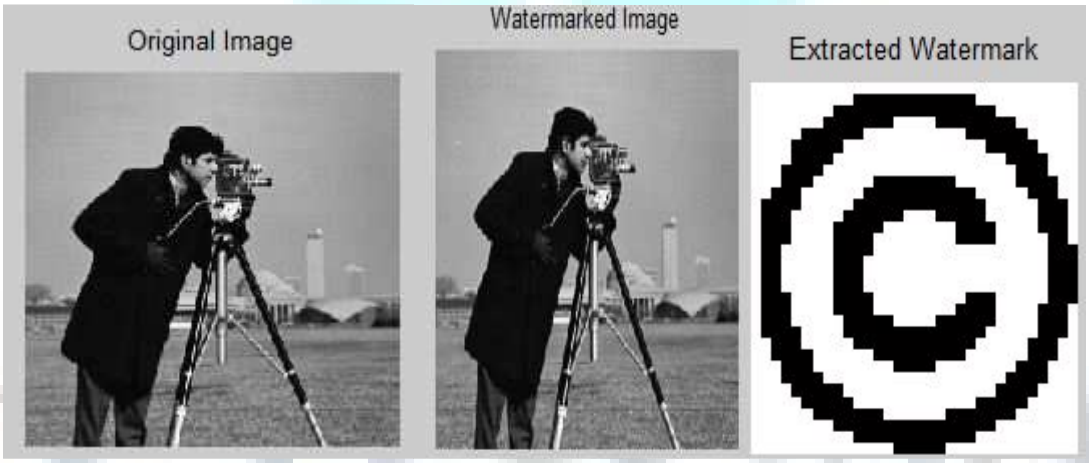
FIG. 6



RESULTS

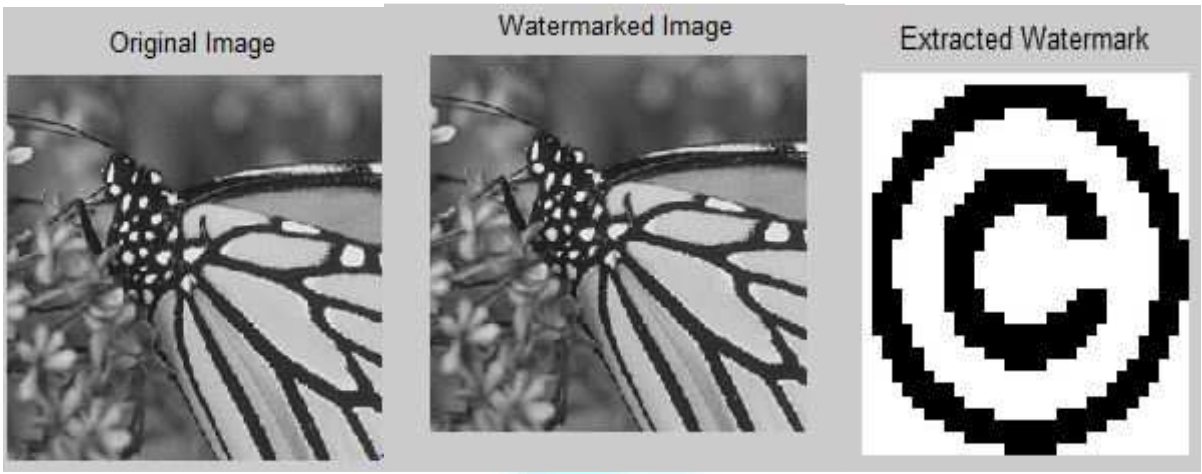
EXTRACTED WATERMARK FROM WATERMARKED IMAGE

FIG. 7



Normalized Cross Correlation is 1.0000
Bit-Error-Rate is 0.0000 %

FIG. 8



Normalized Cross Correlation is 1.0000
Bit-Error-Rate is 0.0000 %

REFERENCES

1. Sengul Dogan & Turker Tuncer & Engin Avci & Arif Gulten″ A New Watermarking System Based on Discrete Cosine Transform (DCT) in Color Biometric Images". J Med Syst (2012) 36:2379–2385 DOI 10.1007/s10916-011-9705-2
2. Franklin Rajkumar.V Manekandan.GRS V.Santhi,″ Entropy based Robust Watermarking Scheme using Hadamard Transformation Technique." International Journal of Computer Applications (0975 – 8887)Volume 12– No.9, January 2011.
3. Simi Elizabeth Chacko Thusnavis Bella Mary.I Newton 3.David Raj.W," Embedding Invisible Watermark in Digital Image Using Interpolation and Histogram Shifting". 2011 IEEE 2011 ,pp 89-93
4. Mei Jiansheng, Li Sukang and Tan Xiaomei,″ A Digital Watermarking Algorithm Based On DCT and DWT". Nanchang, P. R. China, May 22-24, 2009, pp. 104-107.
5. Christine I. Podilchuk,Edward J. Delp "Digital watermarking algorithms and applications", IEEE signal processing magazine,July 2001,pp.46.

COMPOSITION OF FOREIGN DIRECT INVESTMENT IN INDIA: A ROUTE-WISE ANALYSIS

NARENDER
RESEARCH SCHOLAR
FACULTY OF MANAGEMENT STUDIES
UNIVERSITY OF DELHI
DELHI

ABSTRACT

Foreign Direct Investment in India is undertaken in compliance with the FDI policy which is originated and announced by the Government of India. The pre-liberalization period was challenging for the Indian economy to emerge without much resource and there were many constraints to overcome. In 1991, Globalization, Privatization and Liberalization intend for making the Indian economy a faster growing economy and globally competitive. As a result of the continual efforts by the Government of India, FDI has received to the tune of US $ 355415 million by the end of December 2014. This study has analyzed the trends of foreign investment as per International, Country wise and Route wise inflow through Automatic Route and Government approval route since liberalization in between two decades and revealed that much flow of FDI through Approval route has been undertaken by the Automatic route due to much liberalization in the FDI policy by the government to promote the foreign capital in India.

KEYWORDS
Automatic Route, Foreign Direct Investment, Government Approval Route.

JEL CODES
F21, P34.

INTRODUCTION

Indian economy has been making remarkable progress after the period of liberalization. There has been continuous efforts by the Indian Government to attract the foreign investment. The initiatives include rebate in taxes, infrastructure and raise the investment limit in various sectors. As a result, flow of FDI has been continuous rise in one hand and overall progress in various sectors of the Indian economy on the other. Foreign Investment in India is undertaken in accordance with the FDI policy which is formulated and announced by the Government of India aiming towards attracting more and more funds and allowed different channels of investment in India on basis of the entity of the foreign national.

AUTOMATIC ROUTE Under this Route, the foreign investor or the Indian company does not require any prior approval from the Government of India or the Reserve Bank of India (RBI). The investors are required to notify the Regional office concerned of RBI within 30 days of receipt of inward remittances and file the required documents with that office within 30 days of issue of shares to foreign investors.

GOVERNMENT ROUTE Under this Route, the foreign investor or the Indian company should obtain prior approval of the Government of India. FDI in activities not covered under the automatic route requires prior Government approval. Such proposals are considered by the (Foreign Investment Promotion Board (FIPB), Department of Economic Affairs (DEA), Ministry of Finance or Department of Industrial Policy & Promotion, as the case may be for the investment. Application for all FDI cases, except Non-Resident Indian (NRI) investments, Export Oriented Units (EOUs) and for FDI in retail trading submitted to the FIPB Unit, Department of Economic Affairs (DEA), Ministry of Finance and remain cases handled by Secretariat of Industrial Assistance in Department of Industrial Policy & Promotion.

A foreign investing company is entitled to acquire the shares of an Indian company without obtaining any prior permission of the FIPB subject to prescribed parameters. If the acquisition of shares directly or indirectly results in the acquisition of a company listed on the stock exchange, such would require the approval of the Security Exchange Board of India. Since liberalization below mention table shows the foreign equity inflows by comprising FIPB,SIA, Automatic routes and Acquisition of shares under the various route scheme.

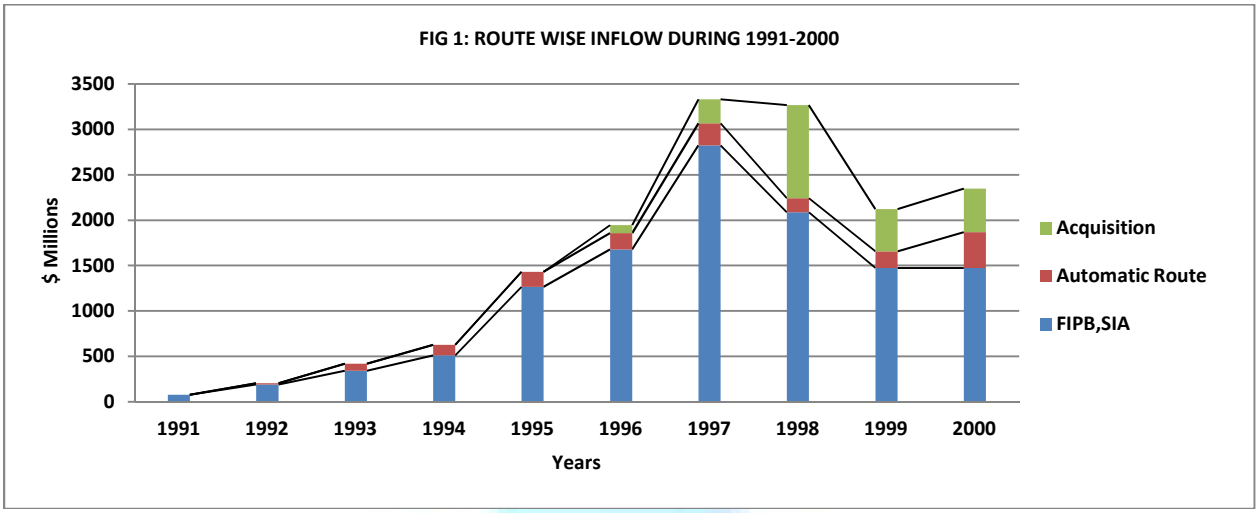
TABLE 1: ROUTE WISE FDI EQUITY INFLOW

Year (January-December)	Govt. Approval Route (FIPB,SIA)	Automatic Route	Inflows through acquisition of existing shares	RBI's -Various NRI's Schemes	Total
1991	78	-	-	66	144
1992	188	17	-	59	264
1993	340	78	-	189	607
1994	511	116	-	365	992
1995	1264	168	-	633	2065
1996	1677	180	88	600	2545
1997	2824	241	266	290	3621
1998	2086	154	1028	91	3359
1999	1474	181	467	83	2205
2000	1474	394	479	81	2428
2001	2142	720	658	51	3571
2002	1450	813	1096	2	3361
2003	934	509	636	-	2079
2004	1055	1179	979	-	3213
2005	1136	1558	1661	-	4355
2006	1534	7120	2465	-	11119
2007	2585	8889	4447	-	15921
2008	3209	23650	6170	-	33029
2009	4680	19056	3308	- -	27044
2010	2542	14353	4111	- -	21007
2011	2933	19053	12636		34621
2012	2964	15825	4000		22789
2013	1345	12806	7887		22038
2014	1569	18463	6591		26624
TOTAL	41994	145523	58973	2510	249001

(Source: SIA Newsletter, Various Issues in US $ million)

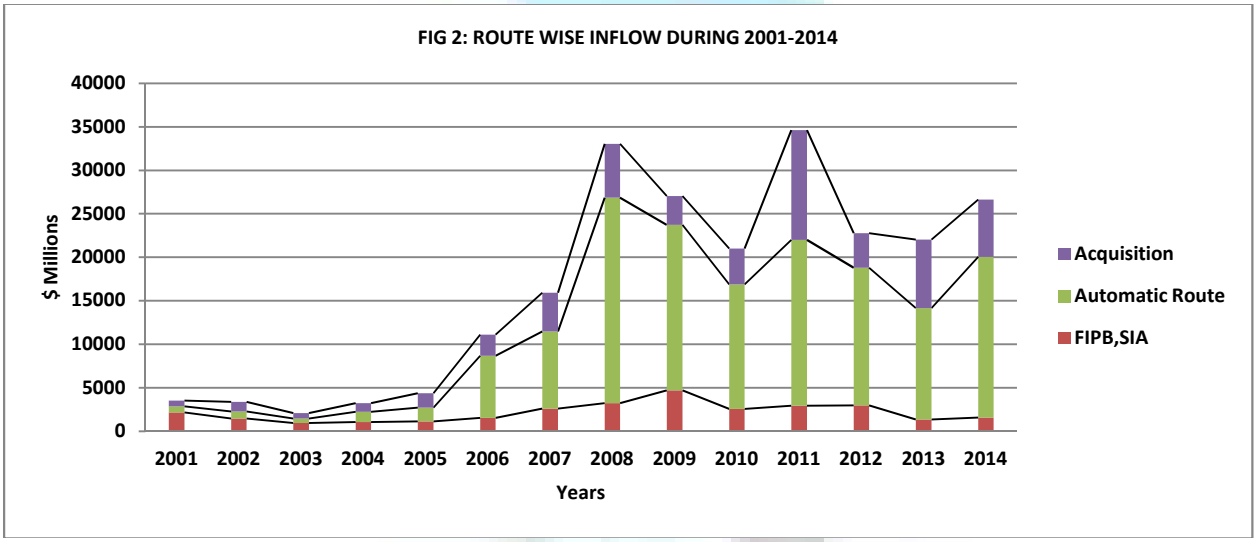
ROUTE WISE FOREIGN DIRECT INVESTMENT

Flow of foreign investment after liberalization to 2003 through government approval route was higher as compared to automatic and acquisition of share as per figure one. Much project approved by the government during the year 1997 that means much foreign direct investment in equity generated in this year. During 1991 only US $ 144 million of FDI generated but during 2000 it was raised to US $ 2428 million. Flow of FDI in India was only less than one percentage as compare to the world. Later on during 2014 it has raised to the US $ 26624 million through these types of route which is almost two percent of the world foreign direct investment.



(Source: Compiled and computed by the author)

Through automatic route during 1991 to 2000 very less amount of FDI equity generated due to the later initiated by the government in FDI policy Two decades of FDI equity inflow have been represented which shows reverse effect. During the year 2001 to 2014 much flow of FDI through approval route has been undertaken by the automatic route due to much liberalization in the FDI policy by the government to promote the foreign capital in India.

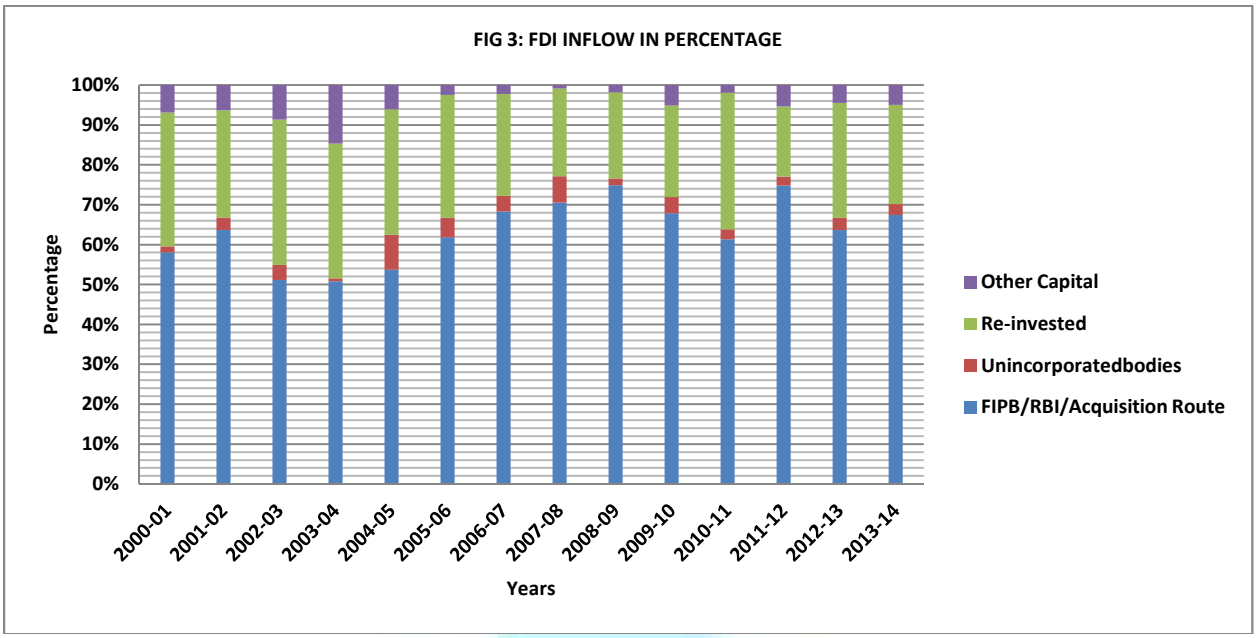


(Source: Compiled and computed by the author)

Acquisition of shares during 1996 was US $ 88 million which raised to the US $479 million up to year 2000. Later on it has raised to the US $12636 million in the year 2011 which is all time high after the liberalization of Indian economy in this route of FDI. The trends and slope of FDI equity inflow through approval route has upward trend in above figure but in later of the years it show downward trend in flow of FDI. On the other hand trend of FDI inflow through automatic route has downward in above figure one whereas, upward in figure two. Both of figures have been compiled by the author on the basis of above table i.e. route wise FDI equity inflow

FOREIGN DIRECT INVESTMENT AS PER INTERNATIONAL

According to International Monetary Fund (IMF) definition contained in the Balance of Payments), FDI has three components, viz., equity capital, reinvested earnings and other direct capital. A large number of countries, including several developing countries report FDI inflows in accordance with the IMF definition. Equity capital considered as equity inflow through FIPB, SIA, Automatic route(RBI) and unincorporated bodies whereas re-invested earnings and other capital relates to the debt that has been taken by the government through various international bodies. As per international practice, below figure shows the composition of foreign direct investment by equity inflow, re-invested earnings and other capital which is related to both equity and debt to the Indian economy. Cumulative FDI inflow during 1991 to 2000 was US $ 15483 million and later it has raised to the US $ 36046 million in financial year 2013 to 2014.



(Source: Compiled and computed by the author)

Equity inflow during 2011-12 has higher in percentage which is 75% of the total FDI in India. Similar trend has been shown by the equity inflow in India among all the years without much fluctuation as per figure three. Percentage of equity in total FDI has always high among all the years and which makes positive impact in growth of Indian Economy as per previous studies

COUNTRY WISE FOREIGN DIRECT INVESTMENT

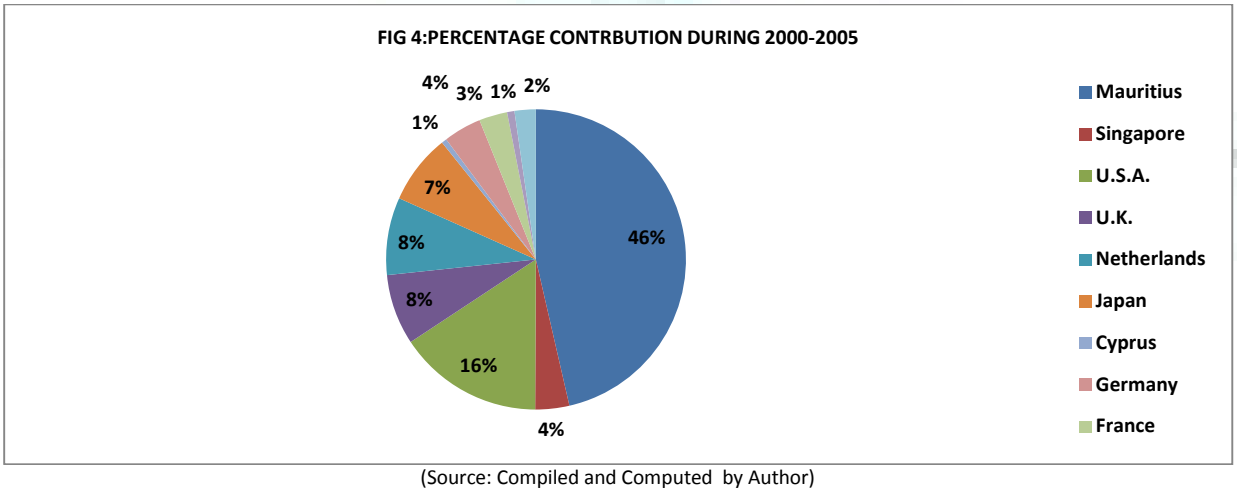
Table two depicts the country wise FDI inflow in India during Jan 2000 -Nov 2014. The analysis indicates that large part of FDI in India contributed by top ten countries which Rs 9404386.58 (US $ 202038) million while remaining approx. 11 per cent by rest of the world.

TABLE 2: COUNTRY WISE FDI EQUITY INFLOW (RS. IN MILLION)

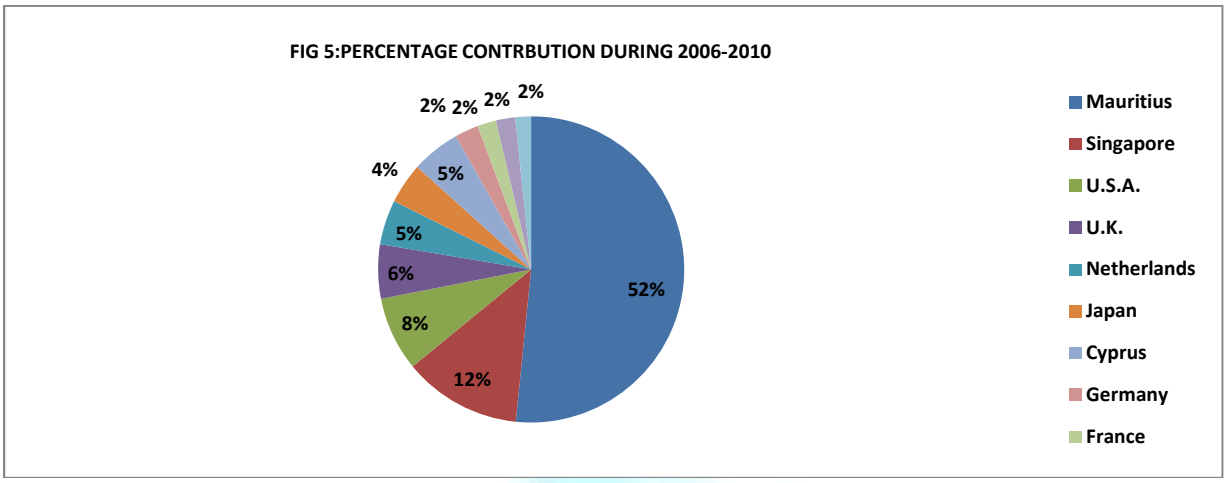
Sl. No	Country	2000-2005	2006-2010	2011-2014	2000-2014	2000-2014 (US $ mn)
1	Mauritius	349666.91	2029759.9	1646844.3	4026271.05	83917.42
2	Singapore	27588.56	489617	967885.83	1485091.39	29193.65
3	U.S.A.	117639.56	308561.87	219593.94	645795.37	13425.75
4	U.K.	57435.49	224841.67	461129.91	743407.07	21774.70
5	Netherland	62934.56	185282.92	462523.27	710740.75	13684.81
6	Japan	56757.64	169478.89	463498.52	689735.05	17636.96
7	Cyprus	4136.88	202654.09	178884.8	385675.77	7916.08
8	Germany	30914.29	99263.53	223580.32	353758.14	7144.09
9	France	22888.72	77952.66	118895.9	219737.28	4417.59
10	Switzerland	17285.37	65947.96	60941.38	144174.71	2927.70

(Source: SIA Newsletter, Various issues)

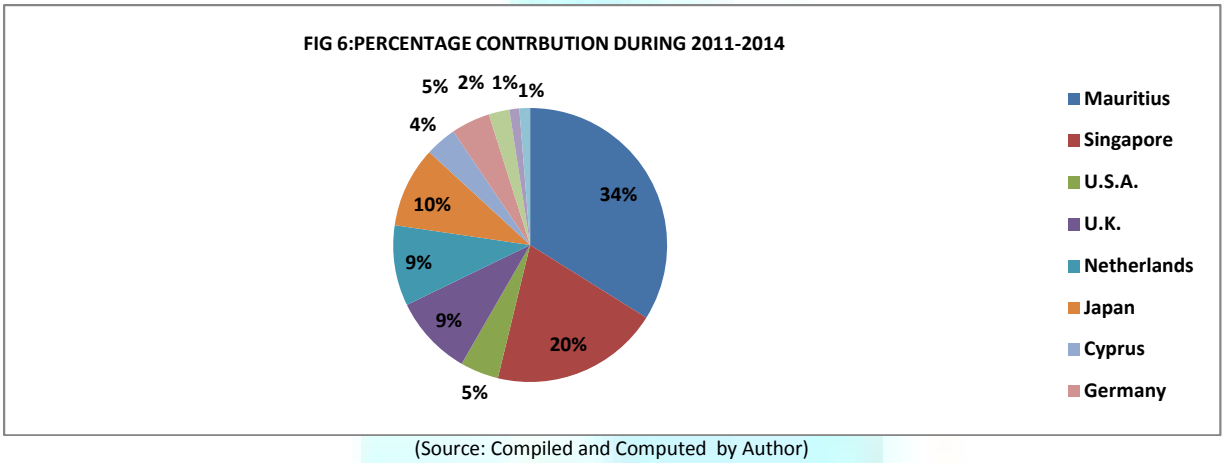
Mauritius emerged as the most dominant source of FDI contributing Rs 4026271 (US $ 83917) million of the total investment in the country. It is because the India has Double Taxation Avoidance Agreement (DTAA) with Mauritius. This type of taxation has been made out with Singapore .So Singapore is second largest investor of FDI inflow in India i.e. US $ 29194 million. The other major countries are U.K with a relative share US $ 21774 million followed by Netherland. While some countries like Cyprus, Germany, France and Switzerland has fewer shares in FDI Inflow of top ten countries.



(Source: Compiled and Computed by Author)



(Source: Compiled and Computed by Author)



(Source: Compiled and Computed by Author)

Figure four, five and six represent the percentage of total FDI inflow in India by different countries in three time frames. FDI inflow during 2000-05 of Mauritius contributes 46 percent of total FDI inflows among top ten countries. Whereas during 2006-10 contribute 52 percent inflow from this country. That means Mauritius is the most dominating mode of foreign equity inflow in India among all the countries. Singapore is the second most dominator which increased in contribution up to 16 percent from 2000 to 2014 and further followed by U.S.A, U.K, Netherland, Japan etc Three pie charts of different decades represents the percentage contribution of top ten countries.

CONCLUSION

We cannot expect faster economic growth without to know the trends and behavior of foreign capital inflow. Various forms of foreign capital inflows generated after the period of liberalization. As per international, FIPB and RBI routes are the most dominant source of foreign equity investment in India, which comprise with 70 percentage of total investment. During the year 2001 to 2014 much flow of FDI through FIPB route has been undertaken by the RBI route due to much liberalization in the FDI policy by the government to promote the foreign capital in India. Though the foreign inflows into India have gone up, but it is very less as compared to other developing countries. Therefore, there is a need to adopt more innovative policies and good governance practices with international standards by the Government of India to attract foreign investors in various sectors of the economy.

REFERENCES

1. Agrawal, Gaurav. (2011), "Impact of FDI on GDP: A Comparative Study of China and India," International Journal of Business and Management, Vol. 6, No. 10, pp. 71-79.
2. Brenan, Micheal J., and Henery, H. (1997), " International Portfolio Investment Flows," Journal of Finance, 2, pp. 151-93.
3. Chipalkatti and Rishi. (2001), "External Debt and Capital Flight in the Indian Economy," Oxford Development Studies, 1, pp. 31-44.
4. Compiled and computed from the various issues of Economic Survey, RBI Bulletin, Economic Survey of India (2012-14), Government of India.
5. Department of industrial policy & promotion, GOI, Economic surveys.
6. Dhankar, Raj S., "Flow of Foreign Direct Investment and its implications for developing countries," Finance India, Vol. 2, No. 3, pp. 9-32.
7. Duttaray, Mousami, Dutt A.K and Mukhopadhyay, Kajol. (2003), "The Relation between Foreign Direct Investment and Growth: Causality and Mechanisms," Asian Development Review, 83, pp. 369-75.
8. Khanna. (2002), " Has India Gained From Capital Account Liberalisation? Private Capital Flows and the Indian Economy in the 1990s," International Money And Developing Countries: Theoretical And Policy Issues In The Current Context.
9. Kohli. (2003), " Capital Flows and Domestic Financial Sector in India," Economic Political Weekly, 22, pp. 761-768.
10. Malik. (2010), " Impact of Foreign Direct Investment on Employment Level In Pakistan: A Time Series Analysis," Journal of Law, Policy and Globalization, 10.
11. Narender, Shilpi Devi. (2015), "Foreign Direct Investment and Growth in BRICS Countries: A Review,"International Journal of Science and Research, Vol. 4, No. 4.
12. Rachidi and Saidi. (2011), " The Impact of Foreign Direct Investment and Portfolio investment on Economic Growth in Developing & Developed Economies," Interdisciplinary Journal of Research in Business, Vol. 1, No. 6, pp. 10-77.
13. Sharma. (2000), " Export Growth in India: Has FDI Played a Role," Yale University.

WEBSITE

14. www.madaan.com

REQUEST FOR FEEDBACK

Dear Readers

At the very outset, International Journal of Research in Computer Application & Management (IJRCM) acknowledges & appreciates your efforts in showing interest in our present issue under your kind perusal.

I would like to request you tosupply your critical comments and suggestions about the material published in this issue as well as on the journal as a whole, on our E-mail**infoijrcm@gmail.com** for further improvements in the interest of research.

If youhave any queries please feel free to contact us on our E-mail infoijrcm@gmail.com.

I am sure that your feedback and deliberations would make future issues better – a result of our joint effort.

Looking forward an appropriate consideration.

With sincere regards

Thanking you profoundly

Academically yours

Sd/-
Co-ordinator

DISCLAIMER

The information and opinions presented in the Journal reflect the views of the authors and not of the Journal or its Editorial Board or the Publishers/Editors. Publication does not constitute endorsement by the journal. Neither the Journal nor its publishers/Editors/Editorial Board nor anyone else involved in creating, producing or delivering the journal or the materials contained therein, assumes any liability or responsibility for the accuracy, completeness, or usefulness of any information provided in the journal, nor shall they be liable for any direct, indirect, incidental, special, consequential or punitive damages arising out of the use of information/material contained in the journal. The journal, nor its publishers/Editors/ Editorial Board, nor any other party involved in the preparation of material contained in the journal represents or warrants that the information contained herein is in every respect accurate or complete, and they are not responsible for any errors or omissions or for the results obtained from the use of such material. Readers are encouraged to confirm the information contained herein with other sources. The responsibility of the contents and the opinions expressed in this journal is exclusively of the author (s) concerned.

ABOUT THE JOURNAL

In this age of Commerce, Economics, Computer, I.T. & Management and cut throat competition, a group of intellectuals felt the need to have some platform, where young and budding managers and academicians could express their views and discuss the problems among their peers. This journal was conceived with this noble intention in view. This journal has been introduced to give an opportunity for expressing refined and innovative ideas in this field. It is our humble endeavour to provide a springboard to the upcoming specialists and give a chance to know about the latest in the sphere of research and knowledge. We have taken a small step and we hope that with the active co-operation of like-minded scholars, we shall be able to serve the society with our humble efforts.

Our Other Journals