P@SHA
Pakistan Software Houses Association

P@SHA Salary Survey

2008

2008

This document contains findings of the P@SHA Salary Survey 2008.

Participating companies

Alchemy Technologies
www.alchemya.com
Amaana
www.amaana.com
AutoSoft Dynamics Pvt Ltd
www.autosoftdynamics.com
Avanza
www.avanzasolutions.com
CTO Twenty Four Seven
www.cto247.com
Digital Prodigy
www.dprodigy.com
Five Rivers Technologies
www.fiveriverstech.com
Folio 3 Pvt Ltd
www.folio3.com
Jin Technologies Pvt Ltd
www.jintech.com
LMKR
www.lmkr.com
Millennium Software Pvt Ltd
www.millsoft.com.pk
Naseeb Networks
www.naseebnetworks.com
NetSol Technologies Inc
www.netsoltek.com
Mixit Technologies
www.mixittechnologies.com
PixSense Pvt Ltd
www.pixsense.com
Systems Limited
www.systemsltd.com
Tekenable
www.tekenable.com
THK Solutions Pvt Limited
www.thks.com.pk
Ultimus Pvt Ltd
www.ultimus.com
VahZay Pvt Ltd
www.vahzay.com

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ACKNOWLEDGMENTS

P@SHA expresses its thanks to the Salary Survey Working Group for the many hours of effort that they put in to developing the framework and methodology for this survey.

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Imran Zia, Vahzay Pvt Ltd

P@SHA SALARY SURVEY SPONSOR

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1 EXECUTIVE SUMMARY

1.1 Introduction

This document contains findings of the P@SHA Salary Survey 2008. We would like to thank respondent organizations that participated in this survey.

Under the terms of reference for this particular assignment, the survey included a total number of 21 companies. Out of these companies, 7 organizations were from the software outsourcing companies space and 14 organizations from amongst software product development companies. These companies from Lahore, Karachi, Islamabad, Rawalpindi and one other city (the other city name deliberately not disclosed due to identity confidentiality reason) voluntarily took part in the survey.

1.2 Salary Surveys and Reviews

Salary surveys are tools, used to determine the average or median salary paid to employees in one or more jobs. Salary data, collected from several employers, is analyzed to develop an understanding of the amount of salary paid. Surveys may focus on one or more job titles, geographic regions, employer size, and or industries. The purpose of the salary surveys is to provide a means for comparison of salaries at the company. Survey data is often time sensitive and may become out-of-date quickly depending upon dynamic nature of industry. Salary surveys are normally conducted for benchmarking of key jobs and are essential for achieving “external equity” when designing Salary packages.

1.3 The Need

Responsible management of HR budgets remains a key priority for the IT industry. The current economic climate means that it is imperative for executives, line managers and HR professionals to understand the actual status of IT salaries and Salary in order to have informative discussions with employees and to budget responsibly into the future.

Paying people fairly is good for business. If a company underpays, employees will eventually look for a better offer. If it overpays, the payroll budget and profitability will suffer.

In order to determine the prevailing Salary being paid within the Pakistan IT sector, it was felt necessary to "benchmark" jobs in the industry against Salary.

1.4 Goal, Scope and Purpose of Salary Survey

The working group comprising of CEOs from a number of companies of different sizes, deliberated high level goals, defined the scope and agreed on the overall purpose of the salary survey. The scope of this survey was limited so the initiative converged with reasonable effort. More complex and broader surveys can be undertaken at a later date if there is a demand for it.

Goal: Establish salary levels for common software development staff through information sharing.

Purpose: Assist P@SHA member companies to efficiently and equitably maintain salary levels and thereby facilitate employee hiring and retention

Scope: Software Development functions only

It was decided to only cover software development roles for the purposes of this first survey. Roles not included were marketing, HR, G&A, finance, call center/BPO roles, etc. The scope was limited to allow the first stage of the project to proceed while still providing as much value as possible.

1.5 Parameters, Brackets and Grouping of Roles

Much deliberation occurred regarding which roles were needed and the granularity of those roles. It was unanimously decided that a detailed skill set breakdown for programmers should be excluded due to the complexity that this will add in data gathering. Instead, other parameters could provide meaningful information. It was agreed that PHP vs. C++ vs. Java programmers at the junior level will see roughly the same salary structure. As they progress through the organization their roles change and the salary level is governed by experience, whether they are in a lead or management role, the size of the company and the city they are located in.

The following roles were identified to be included:
- Programmer
- Quality Assurance
- Database Administrator
- Architect
- Business Analyst
- Graphics Designer
- Project Manager
- Development Manager
- System Administrators

Since different companies may have different names for each role, a description of each role was developed by the working group to allow participating companies to map their positions to a common nomenclature.

1.6 Data Gathering - Confidentiality of data

It was decided that building trust is the key and that the data collected must be kept anonymous and confidential. A spreadsheet template had been developed for participating companies. It was ensured that the specific data from each of the participating companies would not be shared with anyone. Participating companies had submitted the completed spreadsheets to Jehan Ara, President P@SHA. Only she had access to these spreadsheets with commitment to keep them confidential.

1.7 Compilation

P@SHA solicited proposals from consulting firms to undertake data compilation and analysis of Salary Survey 2008. Oasis International, an independent marketing research consultant, after due process of technical and financial evaluation, was awarded the project.

The methodology to complete this assignment was to first compile the isolated spreadsheets into a single data file for further analysis and report writing. For the sake of confidentiality the consultant was not provided the identities of the participated organizations and this information was masked with dummy names.

1.8 Analysis and Report Writing

P@SHA used the standard renowned hierarchy positions that are common in the software industry. However, to make the analysis more meaningful Oasis further refined the original hierarchy positions into the following categories with the help of position title, experience in current position and management cadre information that was gathered in the data. The modified positions used in this analysis were:

- Entry Level Programmer with < 2 years experience (hereafter referred to as Entry Level Programmer)
- Mid Level Programmer with >2 years experience but not a team lead (hereafter referred to as Mid Level Programmer)
- Senior Programmer with > 2 years experience and a team lead status (hereafter referred to as Senior Level Programmer TL)
- Quality Assurance Individual Contributor (hereafter referred to as Quality Assurance IC)
- Quality Assurance Team Lead (hereafter referred to as Quality Assurance TL)
- Quality Assurance Manager
- Graphics Designer
- Technical Writer
- Product Manager / Business Analyst
- Development Manager
- Project Manager
- Architect
- Database Administrator
- System Administrator

Oasis used marketing research industry's standard analytical tools and techniques for statistical analysis, interpretation of results and report writing.

1.9 Limitation of the Analysis

2 out of the 21 target organizations were excluded from the analysis because of much missing information so the analysis was performed on a total of 19 companies. The total numbers of employee IDs available in the data were 1393; however, 4 employee IDs were removed from the analysis because of non identical/relevant roles. So the analysis was performed on total 1389 unique IDs.

Furthermore, the analysis is based on the information received from the questionnaires floated to the identified organizations. So the validity of the analysis is highly dependent on the accuracy of information P@SHA received from the target organizations. There are some roles with very low sample size bases so these are marked with * to identify that these are not much valid for taking conclusions.

1.10 The Survey Procedure

As the questionnaire was self administered so due care was taken to make it as much self explanatory and with as much click to select (pre-coded) responses as possible. This allowed P@SHA to get consistent inputs from all the target companies. To achieve this goal a definition of roles document was attached along with close ended inputs form in Excel spreadsheet format.

1.11 The Questionnaire

The questionnaire contained the following two broad sections:

1. A definition of roles to assist in the completion of the survey
2 An Excel spreadsheet format for company data submission.

The following information was sought:

- Company information:
- Number of Employees
- Year of Inception
- Primary Nature of Business
- Head office
- Branch offices
- Health Insurance
- Provident Fund
- Gratuity
- Employee Bonus

1.12 Salary Data:

The following information for each target employee titles was filled in. Each row in the salary data worksheet corresponds to a unique employee.

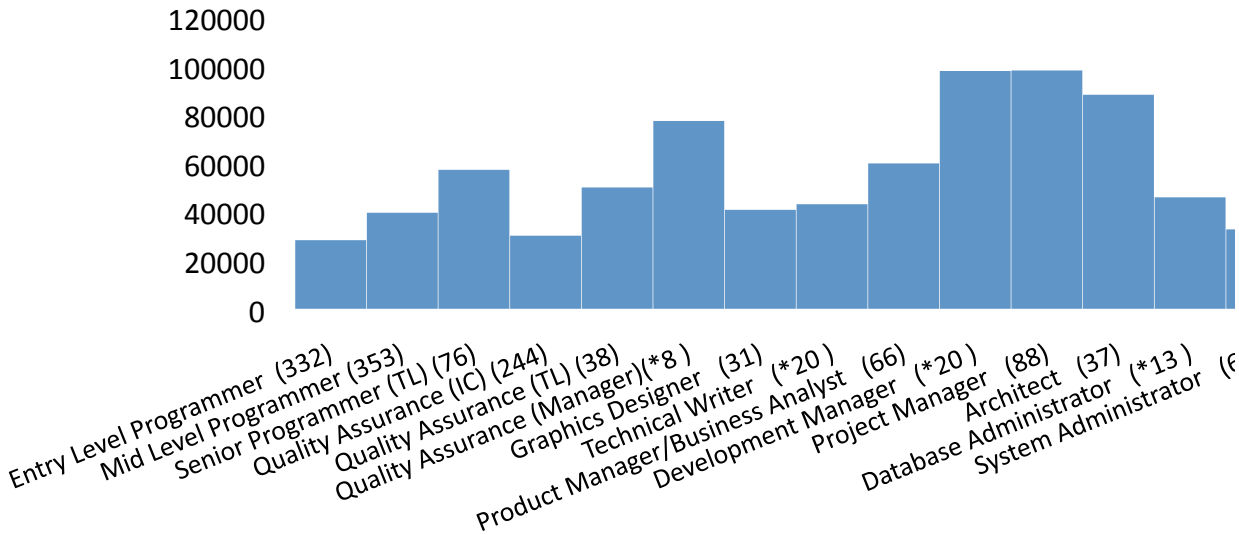
- Employee Number
- Role
- Experience
- Management
- Location
- Monthly Salary
- Car
- Fuel
- Mobile
- Other perks

1.13 Education / Qualifications of IT Personnel

Generally, the software development industry requires the individuals to have BCS, MCS, BS degrees or Engineering degree in Computer Science. In some instances, they are required to possess the related degrees of CE, EE, CSE and several modern skill sets are required according to the projects need.
By and large, the experience requirements increases with the hierarchy levels; however the organizations are indifferent to experience where capabilities of the individuals excel in some way or the other to attain a higher level.

1.14 Statistical Summary (Overall Picture)

	Count	Mean	Median	Minimum	Maximum	Std Deviation
Entry Level Programmer	332	28,264	26,500	6,000	80,000	9,617
Mid Level Programmer	353	39,565	37,000	12,000	83,500	12,162
Senior Programmer (TL)	76	57,246	55,000	25,000	94,000	13,688
Quality Assurance (IC)	244	30,109	29,000	15,000	80,000	8,707
Quality Assurance (TL)	38	49,982	48,500	25,000	80,000	11,510
Quality Assurance (Manager)	*8	77,375	80,000	45,000	120,000	25,065
Graphics Designer	31	40,758	35,000	20,000	101,500	19,121
Technical Writer	*20	43,075	33,500	16,000	120,000	26,420
Product Manager/Business Analyst	66	59,883	57,500	16,000	175,000	31,366
Development Manager	*20	97,968	82,500	50,000	200,000	40,209
Project Manager	88	98,185	95,000	43,000	200,000	30,201
Architect	37	88,175	80,000	40,000	250,000	39,514
Database Administrator	*13	45,923	45,000	14,000	90,000	22,303
System Administrator	62	32,707	30,000	6,000	120,000	19,754
Programmer	761	36,400	34,000	6,000	94,000	14,293
Quality Assurance	291	34,106	31,000	15,000	120,000	14,001



2 DETAILED STATISTICAL ANALYSIS OF EACH ROLE

2.1 Role Definition of Programmer

Programmer performs the following activities:
Acquire new skills in various programming languages and development environments.
Interact with Project Manager, Team Lead, System Architect, and DB Architect to develop and implement detailed technical design, Perform programming and adhere to programming standards and processes, Do Technical documentation, Ensure proper communication to immediate supervisor within the project, Assist with design, coding, unit and integration testing, debugging and documentation of programs, Assist new/junior Developers with design issues identified during development and testing phases, Assist the Development Team Lead/BA in definition of business case and project scope. Support and assist the Development Team Lead/BA in requirements definition, Assist in developing internal and external design specifications, Provide post implementation and on-going production support

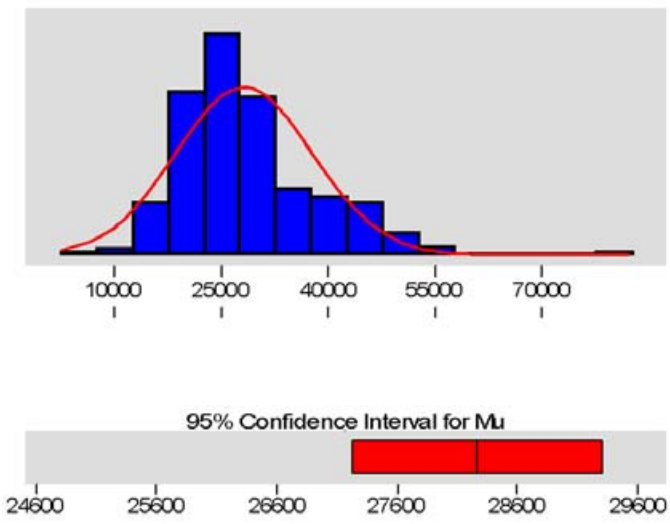
2.1.1 Entry Level Programmer

Companies usually hire fresh graduates on these positions; however, candidates with experience of less than two years in the field of software development / programming / engineering are also hired on these positions. This qualification requirement varies in different enterprises, as it is dependent upon the type of services of that particular concern.

2.1.1.1 Salary Structure of Entry Level Programmers

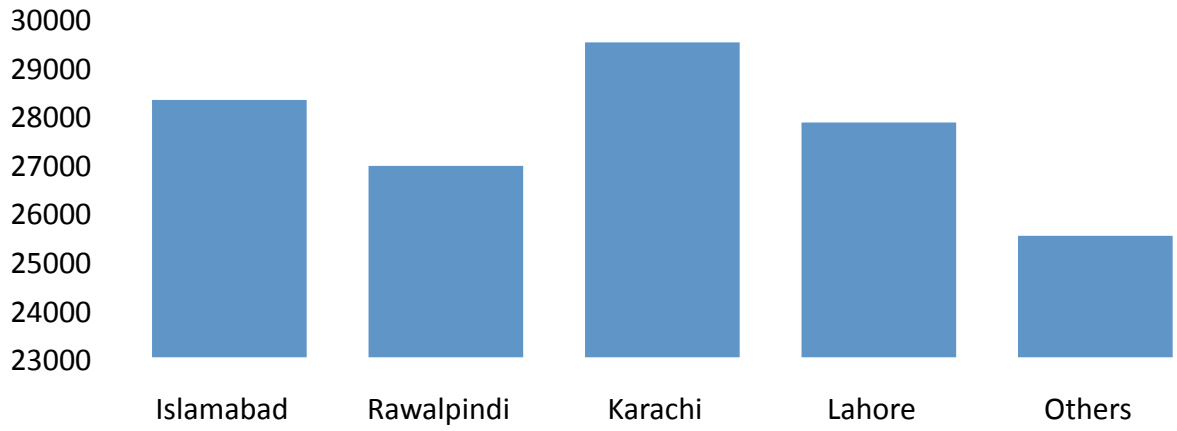
As shown in the Fig. 2.1.1 that the average salary at entry level programmer is Rs. 28,264. The maximum salary at this level is Rs. 80,000 and the minimum is Rs. 6,000. A standard deviation (variation in salaries) of Rs. 9,616 exists at this level. The Skewness of 0.50 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 2.11 shows that the distribution is flat relative to the normal..

Fig 2.1.1



Mean	28263.7
StDev	9616.8
Skewness	1.04768
Kurtosis	2.06222
N	332
Minimum	6000.0
1st Quartile	22000.0
Median	26500.0
3rd Quartile	33000.0
Maximum	80000.0
95% Confidence Interval for Mu	
27225.5	29302.0

2.1.2 City Wise Salary Structure of Entry Level Programmers



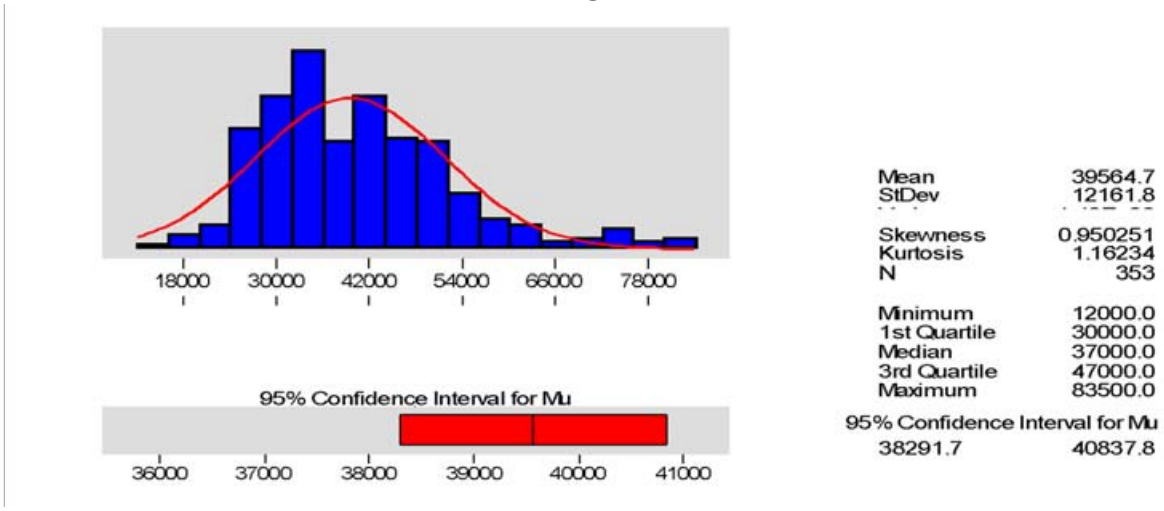
2.1.3 Mid Level Programmers

They have an experience of more than two years in the field of software development / programming / engineering. These personnel acquire skills like System Analysis, System Design, Business Process Reengineering and Functional Specification Document.

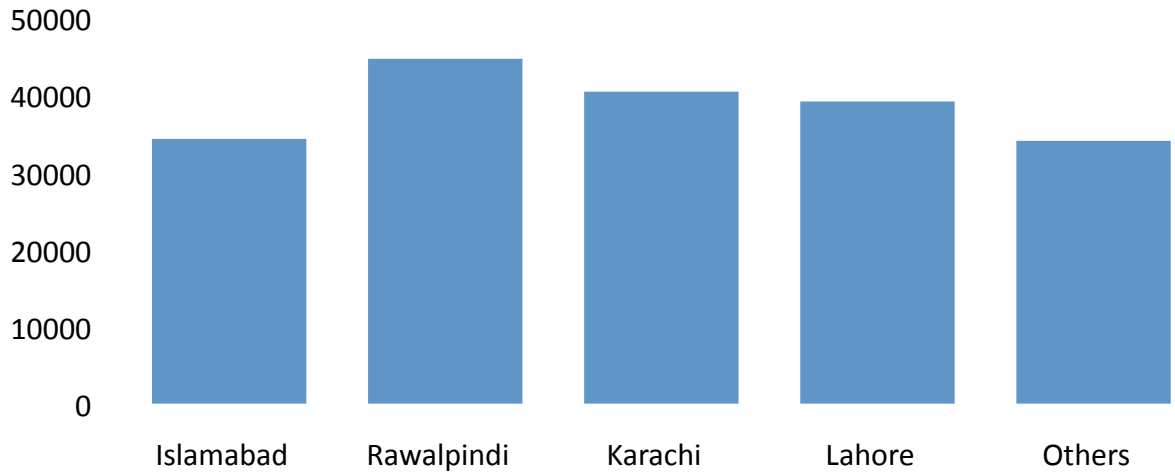
2.1.3.1 Salary Structure of Mid Level Programmers

As shown in the Fig. 2.1.2 the average salary at mid level programmer is Rs. 39,565. The maximum salary at this level is Rs. 83,500 and the minimum is Rs. 12,000. A standard deviation (variation in salaries) of Rs. 12,162 exists at this level. The Skewness of 0.95 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 1.16 shows that the distribution is flat relative to the normal.

Fig 2.1.2



2.1.4 City Wise Salary Structure of Mid Level Programmers



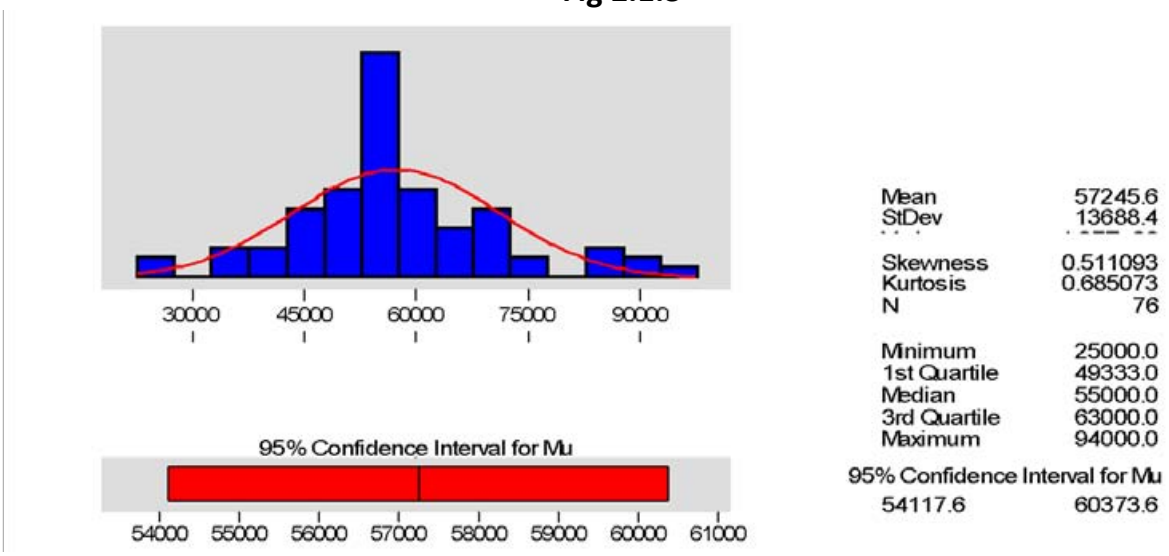
2.1.5 Senior Level Programmers (TL)

The experience of these personnel ranges from five years and more in the field of software development, programming and supervision. These personnel acquire skills like System Analysis, System Design, Business Process Reengineering and Functional Specification Document.

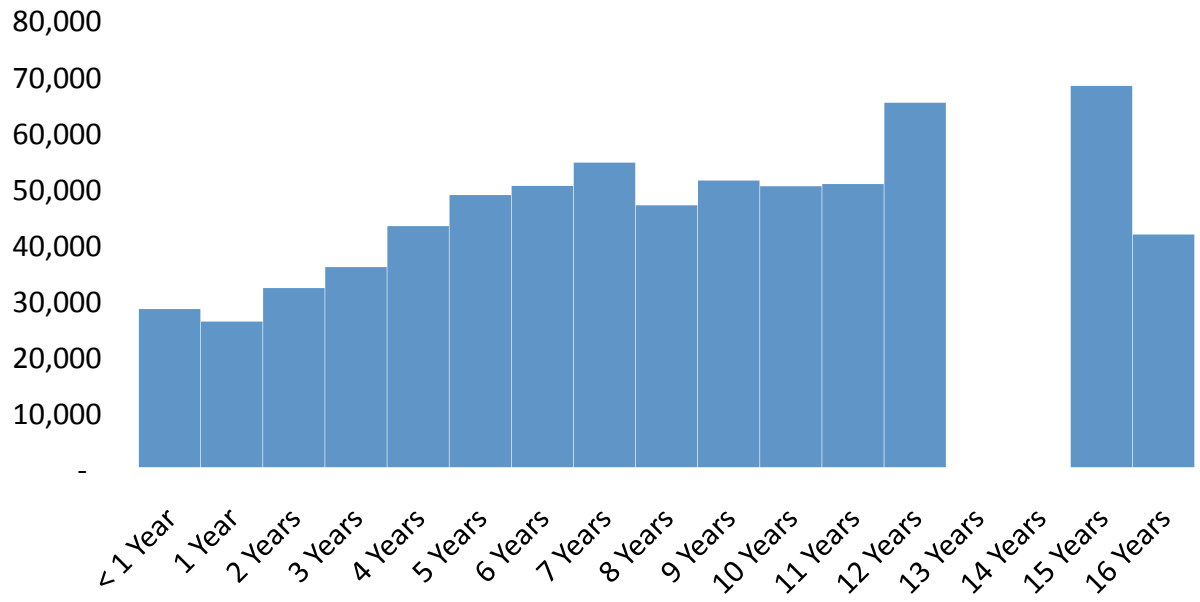
2.1.5.1 Salary Structure of Senior Level Programmers

As shown in the Fig 2.1.3 that the average salary at senior level programmer is Rs. 57,246. The maximum salary at this level is Rs. 94,000 and the minimum is Rs. 25,000. A standard deviation (variation in salaries) of Rs. 13,688 exists at this level. The Skewness of 0.51 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis.69 shows that the distribution is flat relative to the normal.

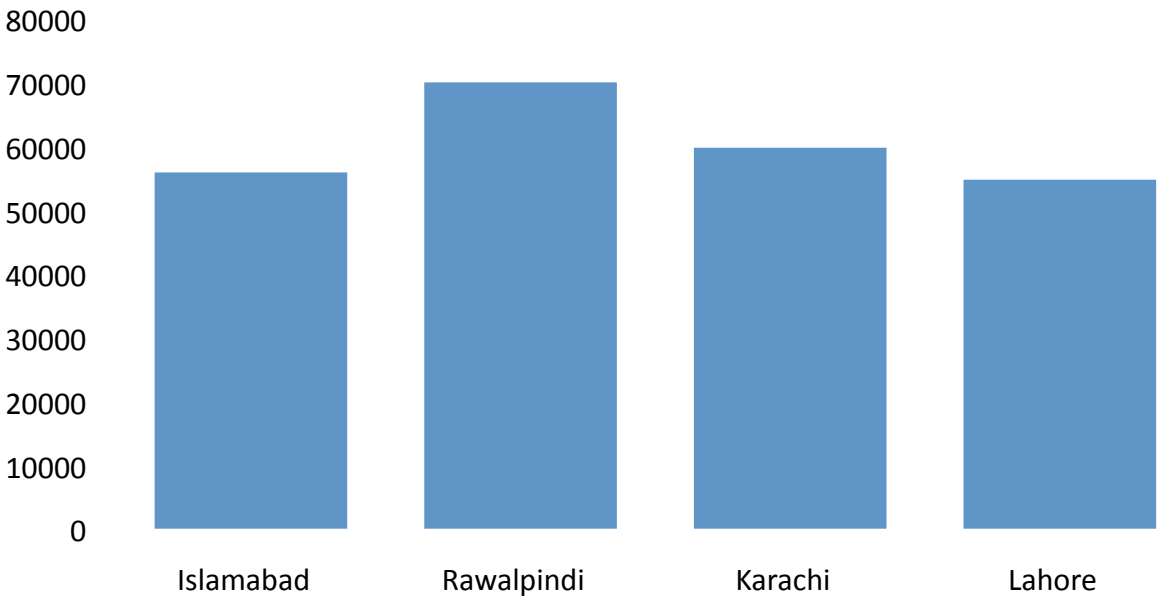
Fig 2.1.3



2.1.5.2 Experience Wise Salary Structure of Programmers:



2.1.6 City Wise Salary Structure of Senior Level Programmers (TL)



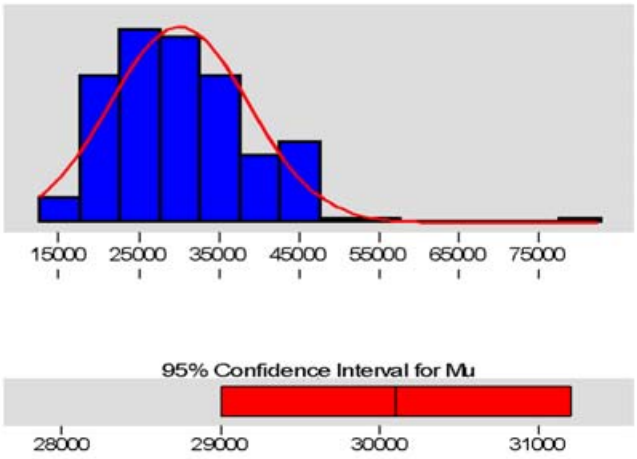
Role Definition of Quality Assurance

Quality Assurance performs the following activities: Update team lead on status of running threads, Review RS, FS and give feedback, Prepare Test Specifications as per the requirement document(s), Generate test data as per the need of Test Specifications, Test application according to Test Plan using Test Specifications, Receive code from the Development Team against set rules, Update QA server with the latest code received from the Development Team, Label the code at the end of agreed upon phases, Enter and update defects in the Defect Tracking System, Verify the patch(s) received against defects, Verify the issues reported by the client, Test shipment package as per instructions, Execute automated test scripts.

2.1.7 Salary Structure of Quality Assurance (IC)

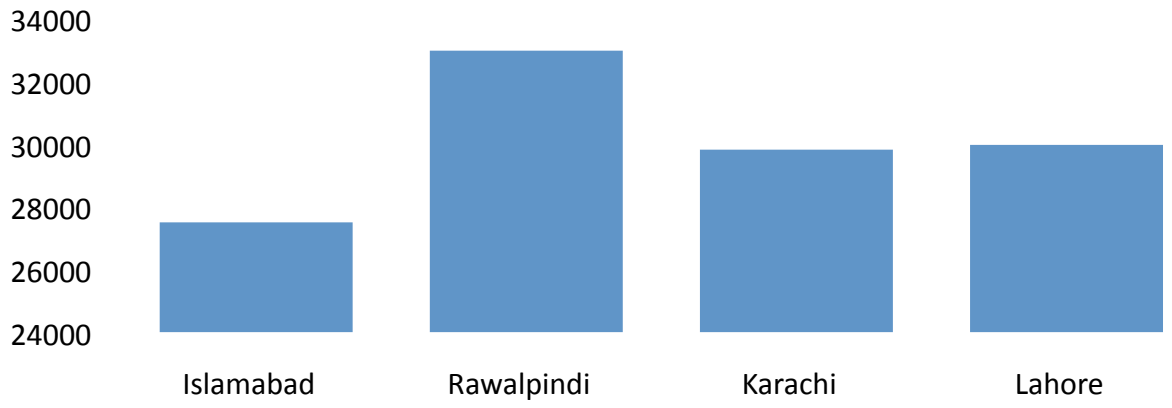
As shown in the Fig 2.1.4 the average salary at entry level programmer is Rs. 30,109. The maximum salary at this level is Rs. 80,000 and the minimum is Rs. 15,000. A standard deviation (variation in salaries) of Rs. 8,707 exists at this level. The Skewness of 1.1 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 3.3 shows that the distribution is peaked relative to the normal.

Fig 2.1.4



Mean	30108.6
StDev	8707.4
Skewness	1.10569
Kurtosis	3.33547
N	244
Minimum	15000.0
1st Quartile	24000.0
Median	29000.0
3rd Quartile	35000.0
Maximum	80000.0
95% Confidence Interval for Mu	
29010.6	31206.6

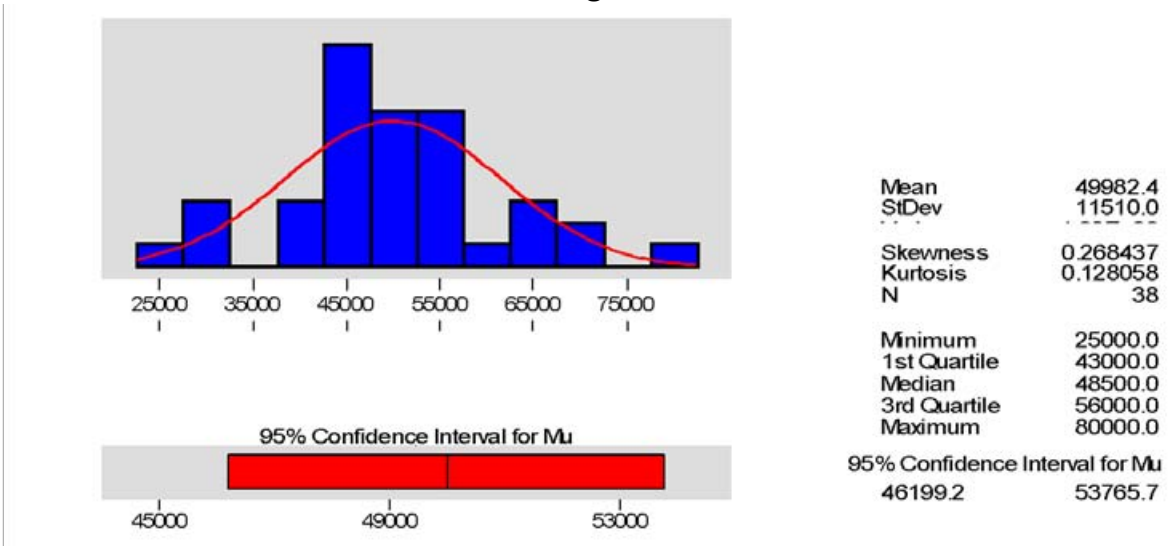
2.1.8 City Wise Salary Structure of Quality Assurance (IC)



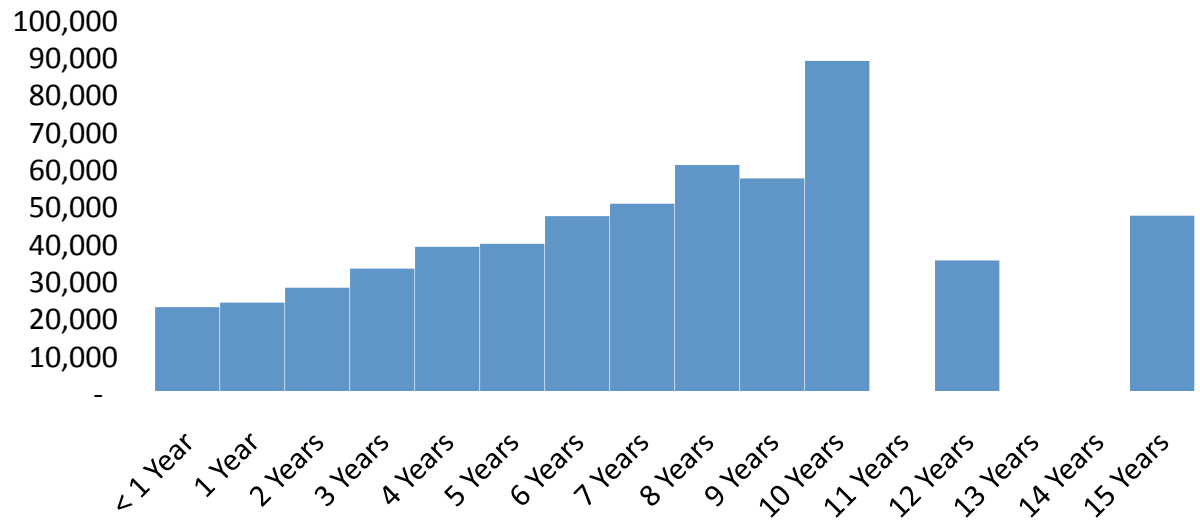
2.1.9 Salary Structure of Quality Assurance (TL)

As shown in the Fig 2.1.5 that the average salary at entry level programmer is Rs. 49,982. The maximum salary at this level is Rs. 80,000 and the minimum is Rs. 25,000. A standard deviation (variation in salaries) of Rs. 11,510 exists at this level. The Skewness of 0.27 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 0.13 shows that the distribution is flat relative to the normal.

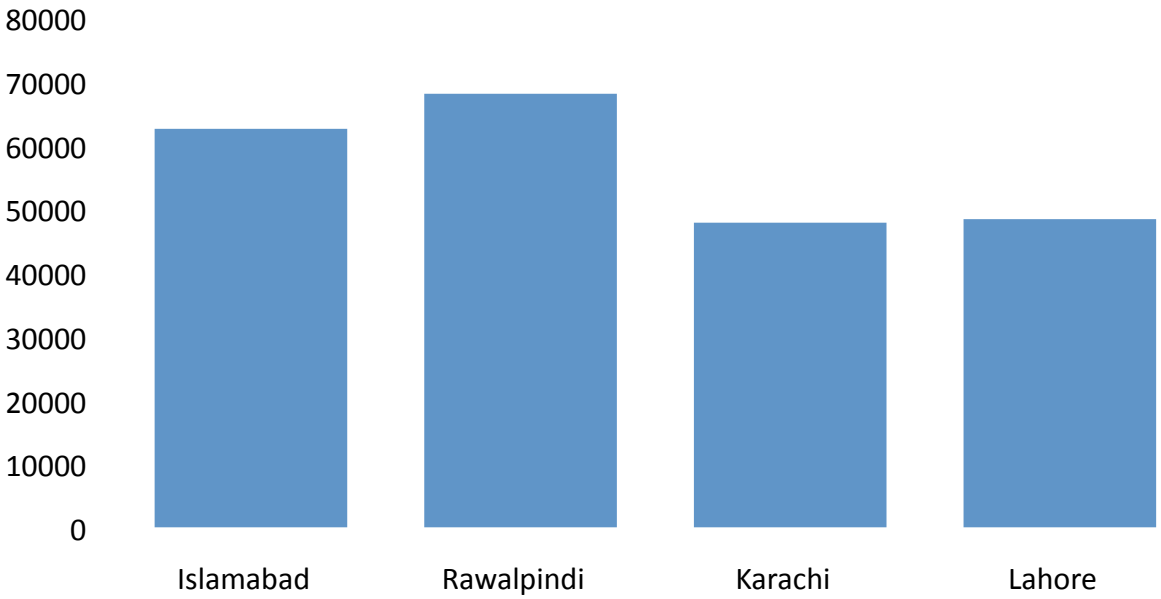
Fig 2.1.5



2.1.9.1 Year wise experience of Quality Assurance (TL)



2.1.10 City Wise Salary Structure of Quality Assurance (TL)



2.2 Role Definition of Graphics Designer

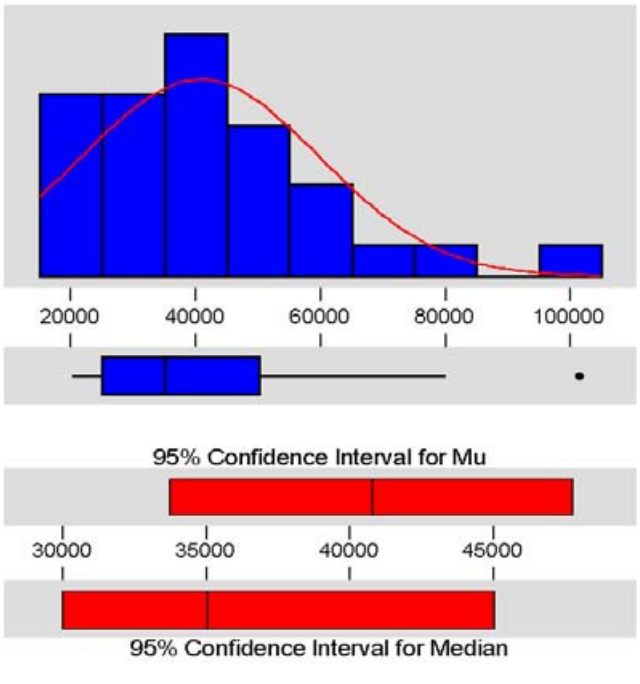
Graphics Designer performs the following activities: Interaction with Business Analyst, Team Leads and System Architect to interpret and develop client's business needs, Create web content, web graphics,

multimedia and creative writing content for web pages, Develop design briefs by gathering information and data to clarify design issues, Think creatively to produce new ideas, Use innovation to redefine a design brief and meet the constraints of cost, time and client, Multi-tasking: Often work on more than one design brief at a time using a wide range of media, including photography and computer aided design, Contribute ideas and design artwork to the overall brief, Keep abreast of developments in IT, particularly design programs, Work well in a team of developers, website designers and marketing specialists, Work to tight deadlines, Ensure proper communication to immediate supervisor within the project, Assist new/junior Developers with interface design issues, Provide post implementation and on-going production support

2.2.1 Salary Structure of Graphics Designer

As shown in the Fig 2.1.6 that the average gross salary at graphics designer is Rs. 49,982. The maximum salary at this level is Rs. 101,500 and the minimum is Rs. 20,000. A standard deviation (variation in salaries) of Rs. 19,121 exists at this level. The Skewness of 1.25 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 1.43 shows that the distribution is flat relative to the normal.

Fig 2.1.6



Mean	40758.1
StDev	19121.0
Skewness	1.25167
Kurtosis	1.42719
N	31
Minimum	20000
1st Quartile	25000
Median	35000
3rd Quartile	50000
Maximum	101500

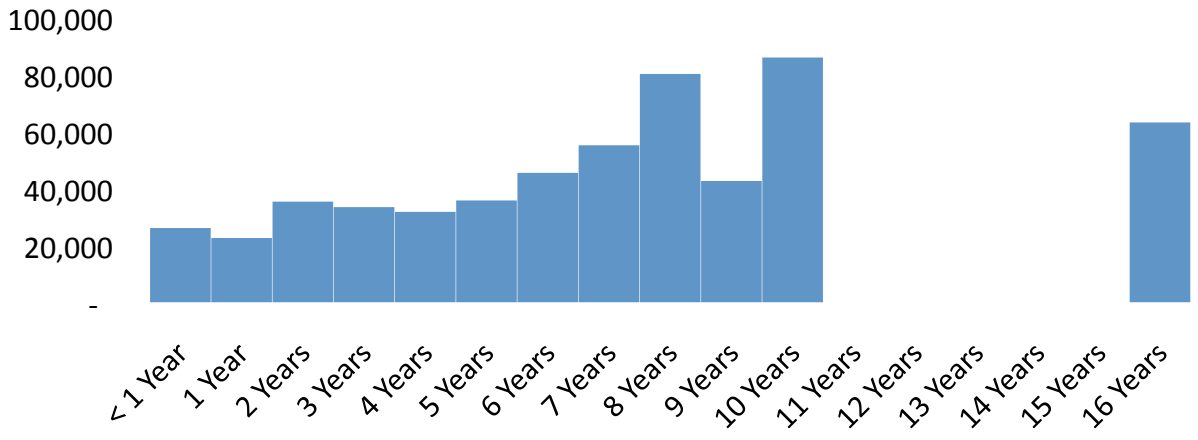
95% Confidence Interval for Mu

33744	47772

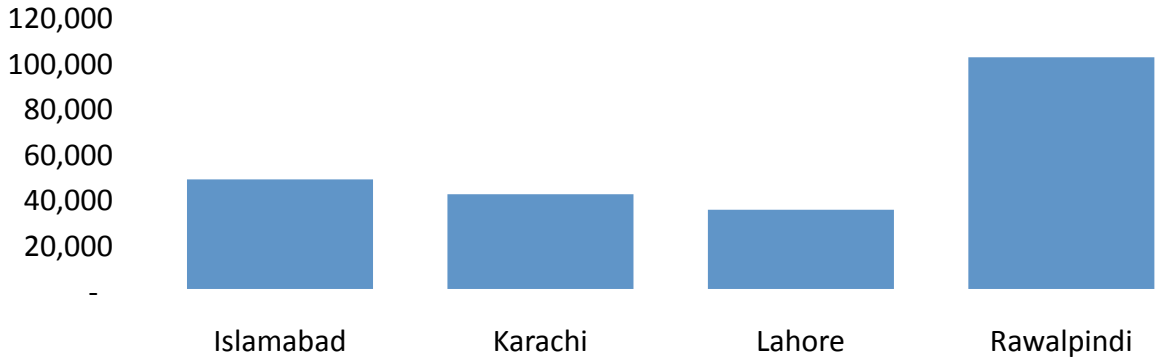
95% Confidence Interval for Median

30000	45000

2.2.2 Experience Wise Salary Structure of Graphics Designers



2.2.3 City Wise Salary Structure of Graphics Designers



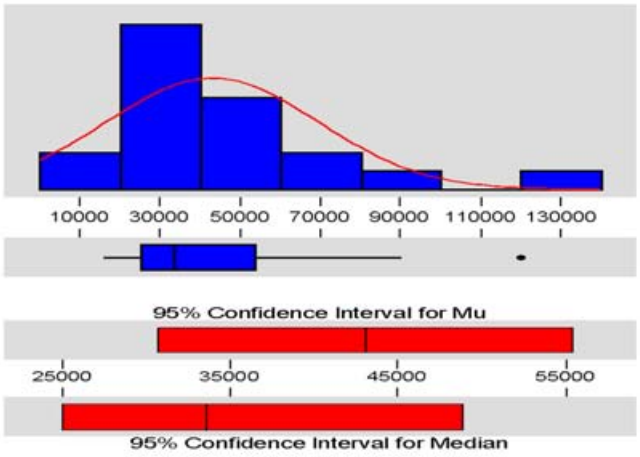
2.3 Role Definition for Technical Writer

Technical Writer performs the following activities and tasks: Preparation of User Guides and Technical Guides, Online Help, Proof reading of documents, Formatting of documents, Index and cross-reference documents such as bulletins and manuals, Produce or arrange for illustrations, charts and photographs to be included in publications, Edit, standardize or revise material prepared by other writers or personnel, Prepare layout of material for publication, Prepare rough drafts of publication for review with project staff and/or customers, Any other task assigned by the management

2.3.1 Salary Structure of Technical Writer

As shown in the Fig 2.1.7 that the average salary at technical writer is Rs. 43,075. The maximum salary at this level is Rs. 120,000 and the minimum is Rs. 16,000. A standard deviation (variation in salaries) of Rs. 26,420 exists at this level. The Skewness of 1.34 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 1.35 shows that the distribution is flat relative to the normal.

Fig 2.1.7



Mean	43075.0
StDev	26419.8
Skewness	1.38581
Kurtosis	1.34799
N	20
Minimum	16000
1st Quartile	25000
Median	33500
3rd Quartile	53750
Maximum	120000

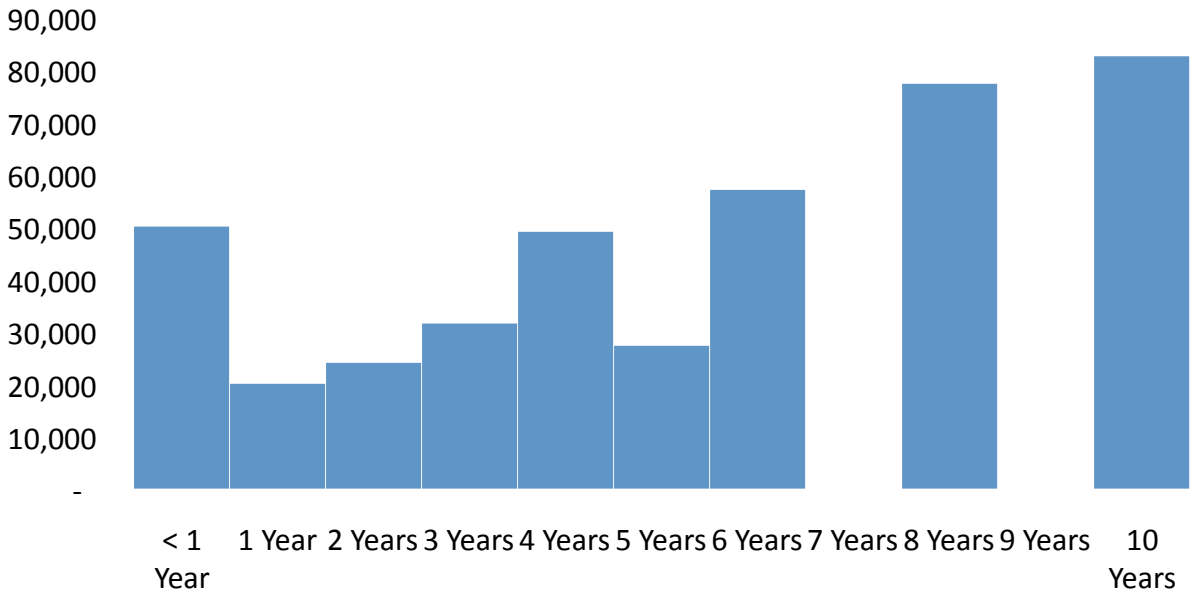
95% Confidence Interval for Mu

30710	55440

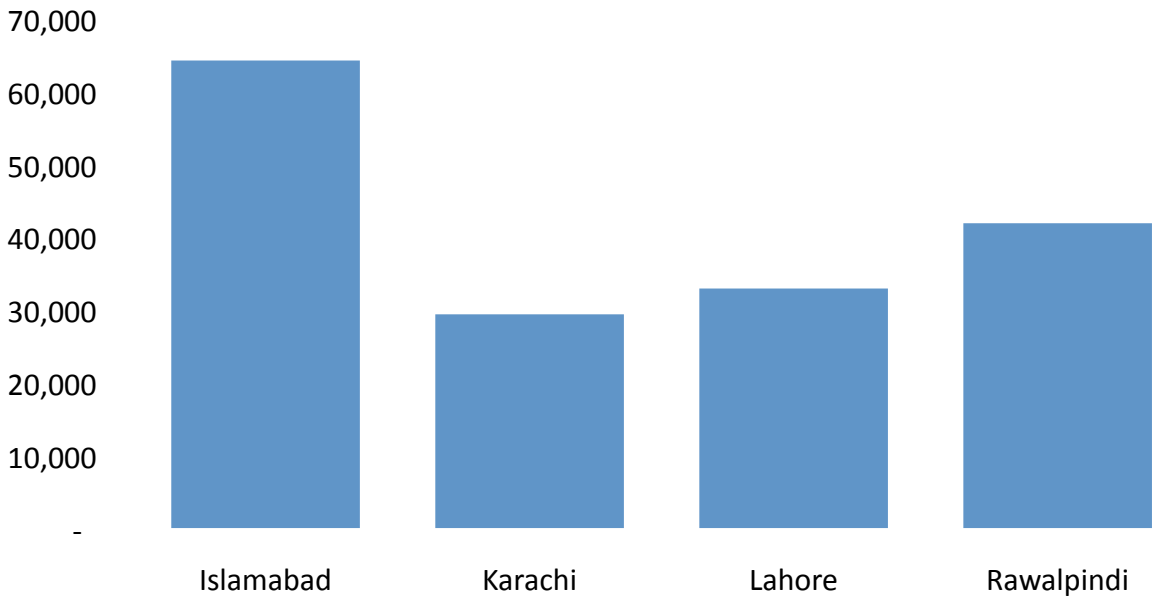
95% Confidence Interval for Median

25000	48824

2.3.2 Experience Wise Salary Structure of Technical Writers:



2.3.3 City Wise Salary Structure of Technical Writers



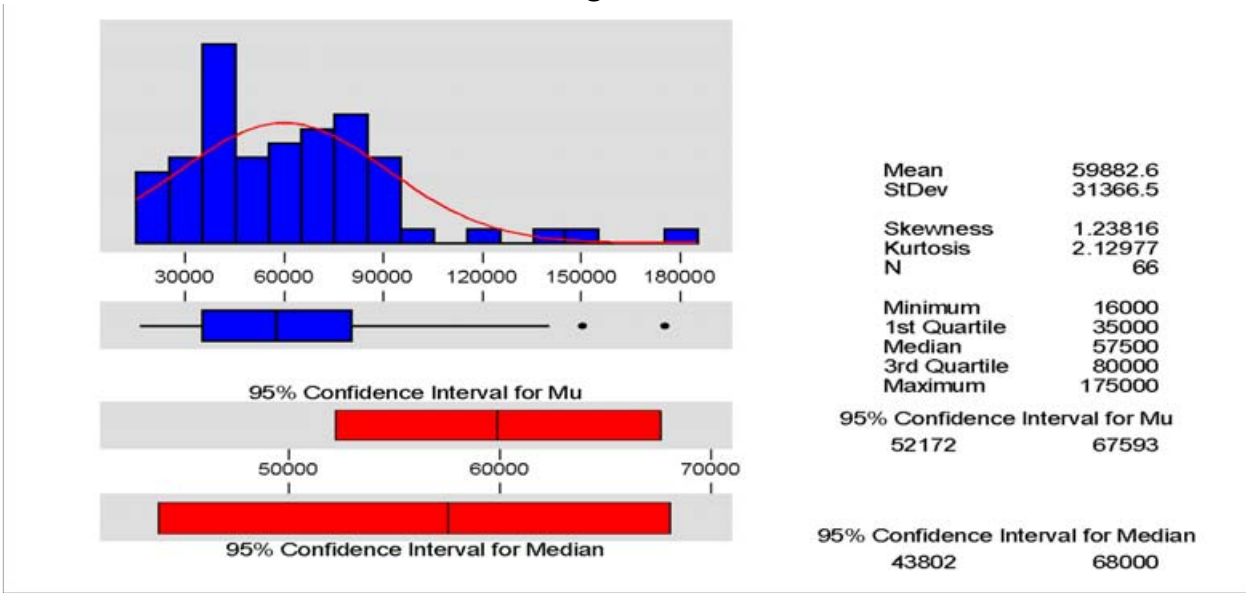
2.4 Role Definition of Product Manager/Business Analyst

Product Managers are responsible for planning and developing the marketing strategy for a single product or group of products. They typically report to a marketing manager or marketing director. They estimate the consumer demand for the product they manage, identify potential customers, stay informed of any competing products on the market, develop pricing strategies, and oversee product development. In addition, they work with advertising and public relations staff to promote the firm's goods and services. Product managers must be able to supervise large groups of workers, think creatively, focus on the overall objectives of the company, and interact with other corporate areas. The growing complexity of doing business means that managers must be increasingly versatile and keep up to date with technological developments.

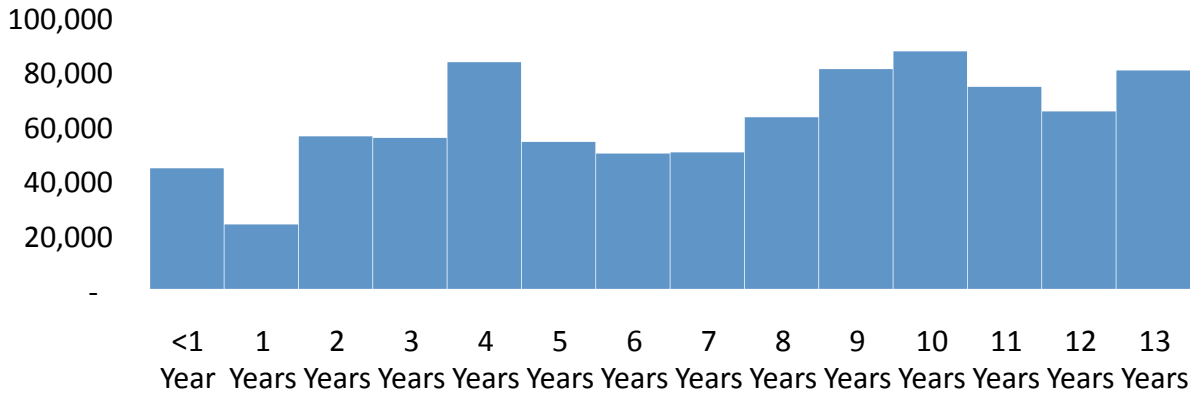
2.4.1 Salary Structure of Product Manager/Business Analyst

As shown in the Fig 2.1.8 that the average gross salary at product manager/business analyst is Rs. 59,883. The maximum salary at this level is Rs. 175,000 and the minimum is Rs. 16,000. A standard deviation (variation in salaries) of Rs. 31,367 exists at this level. The Skewness of 1.24 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 2.12 shows that the distribution is flat relative to the normal.

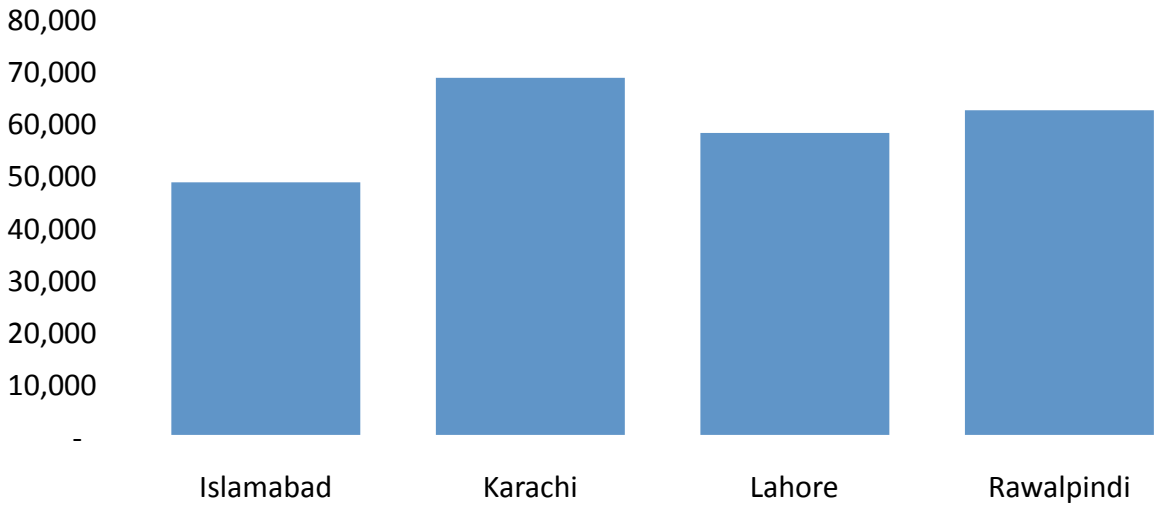
Fig 2.1.8



2.4.2 Experience Wise Salary Structure of Product Managers / Business Analysts



2.4.3 City Wise Salary Structure of Product Managers / Business Analysts



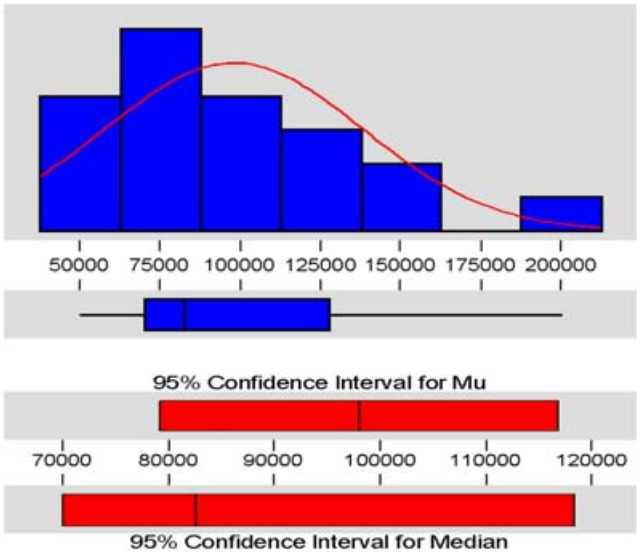
2.5 Role Definition of Development Manager

Development Manager performs the following activities: Lead, manage, mentor, and communicate with development resources, Task break down and assignment with in the development team, Formulate/define specifications and develop applications of varying complexity including the modification of existing applications, Work with business clients and other infrastructure groups to resolve business and system issues, Support and assist the PM with project planning, project definition, requirements definition, analysis, design, testing, system documentation and user training, Develop and maintain project documentation using standard templates and the guidelines, Create and deliver reusable, portable, efficient, and timely code, Monitor and coordinate unit and integration testing, Coordinate and /or assist in the estimation of the technical aspects of systems development projects, Responsible for developing System and Database designs, Ensure adherence to software development methodologies and standards/procedures, Carry out supervisory responsibilities in accordance with the company policies and applicable laws, Manage work assignments and coordination within the development team, Assist Project Manager in developing, implementing and maintaining processes, Update his/her backup about any related activities.

2.5.1 Salary Structure of Development Manager

As shown in the Fig 2.1.9 that the average gross salary at development manager is Rs. 97,968. The maximum salary at this level is Rs. 200,000 and the minimum is Rs. 50,000. A standard deviation (variation in salaries) of Rs. 40,209 exists at this level. The Skewness of 0.86 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis -2.3E shows that the distribution is flat relative to the normal.

Fig 2.1.9



Mean	97968.0
StDev	40209.4
Skewness	0.835874
Kurtosis	-2.3E-01
N	20
Minimum	50000
1st Quartile	70000
Median	82500
3rd Quartile	127500
Maximum	200000

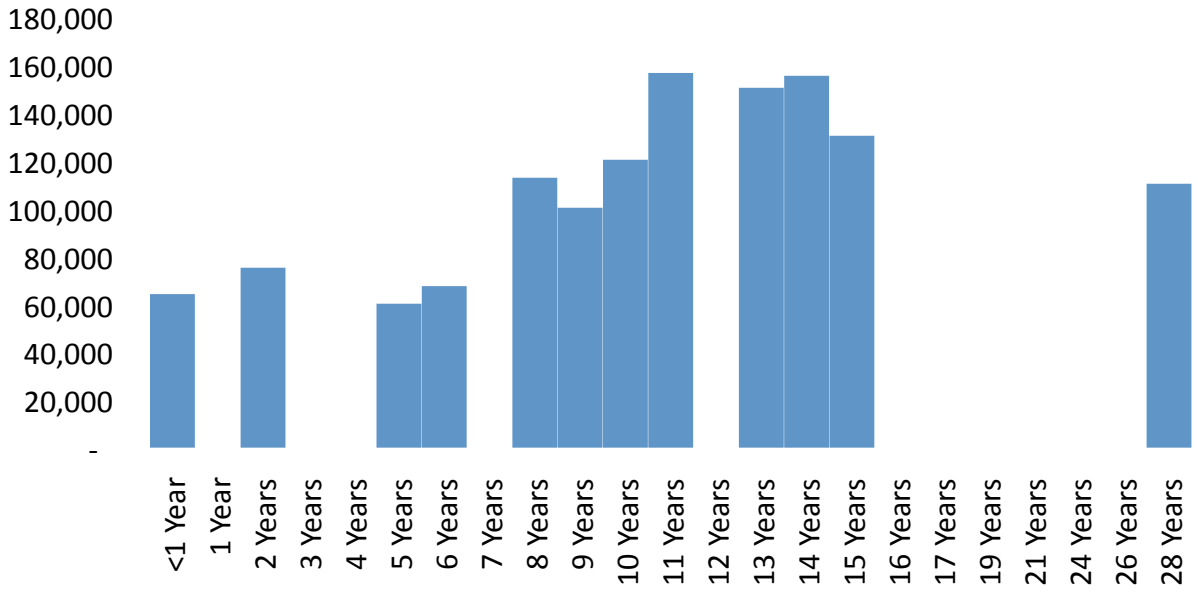
95% Confidence Interval for Mu

79149	116787

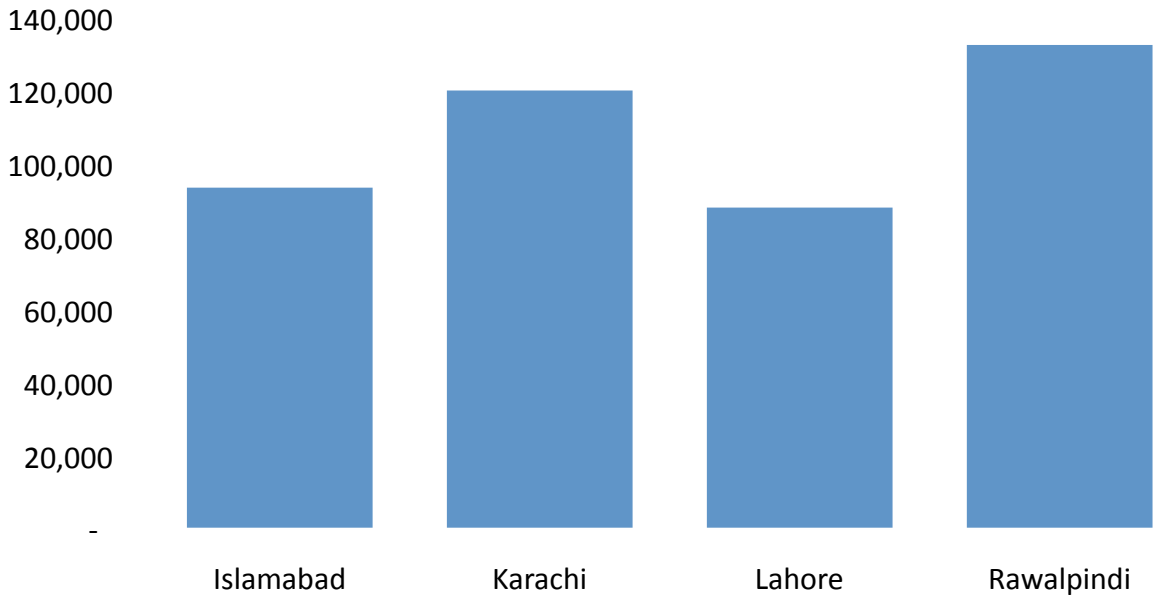
95% Confidence Interval for Median

70000	118203

2.5.2 Experience Wise Salary Structure of Development Managers



2.5.3 City Wise Salary Structure of Development Managers



2.6 `Role Definition of Project Manager

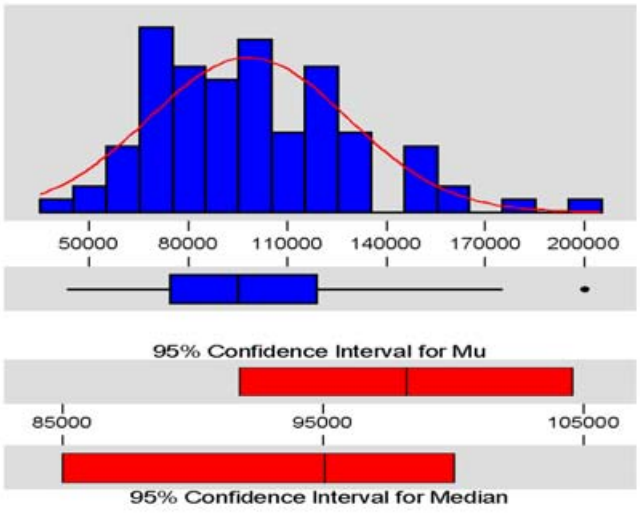
Project Manager performs the following tasks: Organize, plan, lead and control the project team resources, Ensure adherence to software development methodologies and standards/procedures, Recommend, prioritize and develop technology solutions, Plan, estimate, track, provide support and manage application systems/projects, Define project priorities, scope, approach, resource requirement and deliverable timing, Carry out supervisory responsibilities in accordance with the company policies

and applicable laws, Provide and recommend training of development resources, and address/resolve complaints/problems, Manage work assignments and coordination within the project team, Provide counseling, career development guidance, mentoring and overall skill development of the software engineering personnel, Review of all project related artifacts, Update EM on the status of on going development projects, activities, and achievements on a weekly basis, Evaluate performance of development resources (who are assigned on his/her project) and send recommendations to management, Responsible for team sizing and building for software development projects with the approval of management, Coordinate with other Project Managers to resolve any issue(s)

2.6.1 Salary Structure of Project Manager

As shown in the Fig 2.2.0 that the average gross salary at project manager is Rs. 98,185. The maximum salary at this level is Rs. 200,000 and the minimum is Rs. 43,000. A standard deviation (variation in salaries) of Rs. 30,201 exists at this level. The Skewness of 0.76 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 0.43 shows that the distribution is flat relative to the normal.

Fig 2.2.0



Mean	98185.2
StDev	30201.1
Skewness	0.757619
Kurtosis	0.436473
N	88
Minimum	43000
1st Quartile	74250
Median	95000
3rd Quartile	118750
Maximum	200000

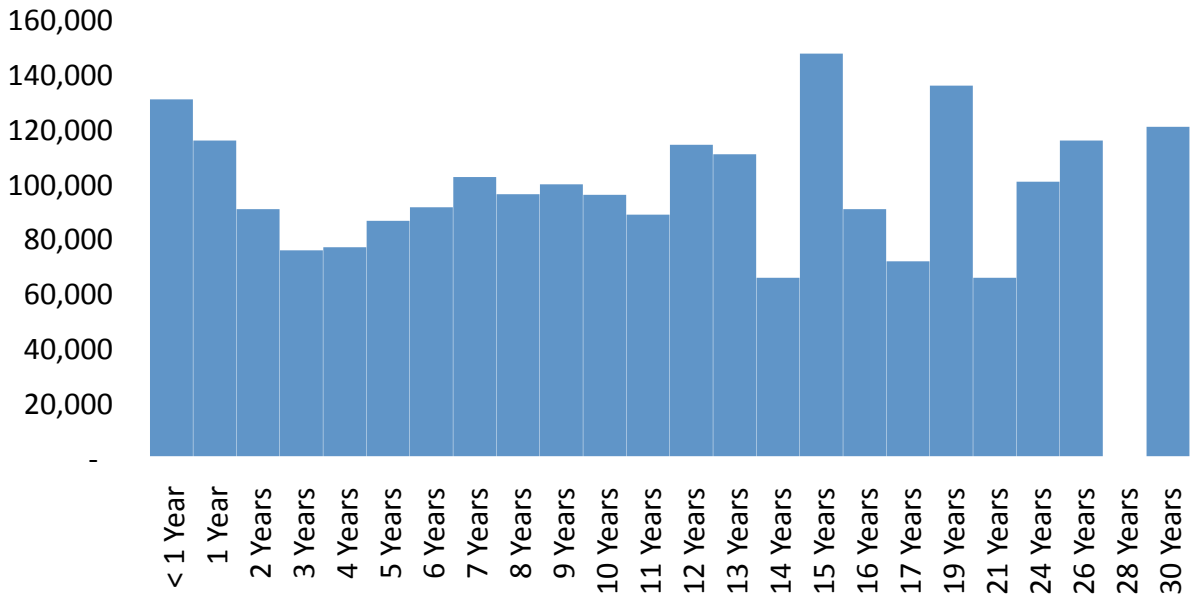
95% Confidence Interval for Mu

91786	104584

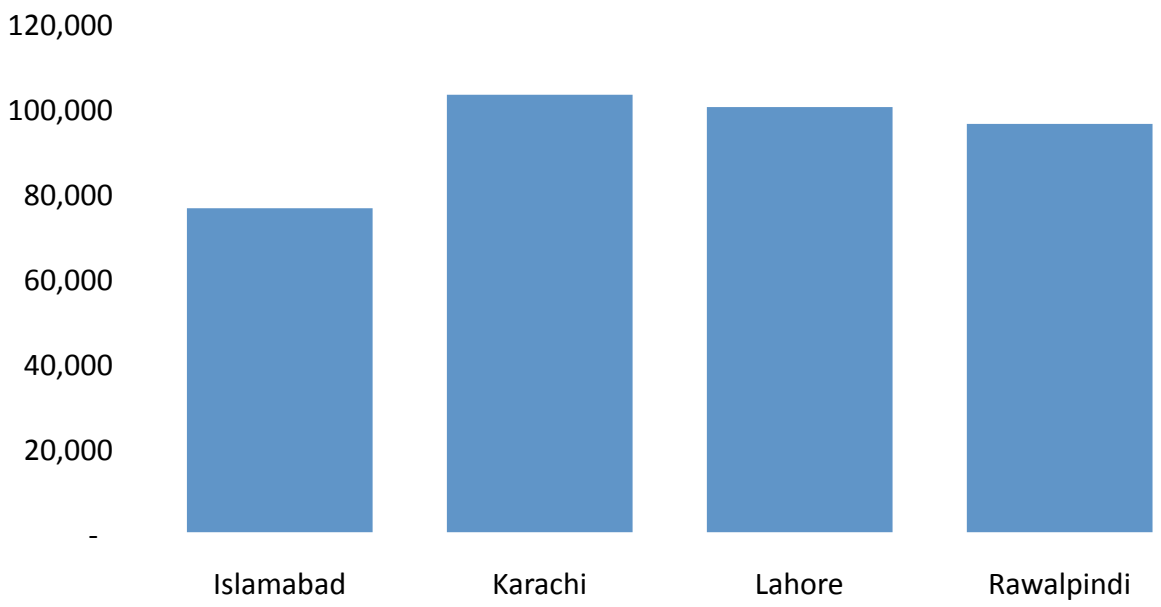
95% Confidence Interval for Median

85000	100000

2.6.2 Experience Wise Salary Structure of Project Managers



2.6.3 City Wise Salary Structure of Project Managers



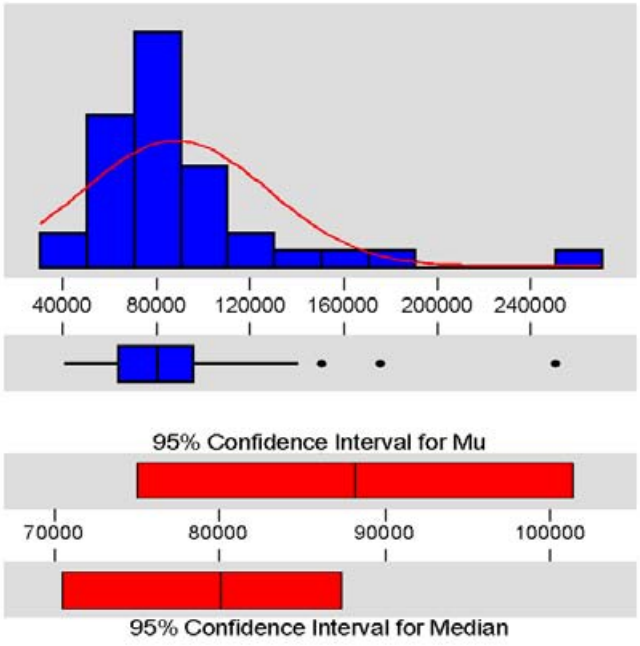
2.7 Role Definition of Architect

Architect performs the following activities: Stays abreast of current trends and developments in IT, Research new technologies and evaluate for suitability in solutions, Provide support to organization on existing and emerging technologies, their utility and their implementation, Plan for continuous professional and technical skill development of resources and send the recommendations to CIO, Drive standards and best practices, Select appropriate tools and technologies for enhancing productivity and quality and manage the deployment of these tools and technologies, Prepare assessment, and feasibility reports on various technologies for senior management, Assist marketing in proposal preparation and assess technical feasibility of project proposals, Responsible for performance appraisals of all the resources in his/her resource pool, Play the role of Architect for key projects and technologies.

2.7.1 Salary Structure of Architect

As shown in the Fig 2.2.1 that the average gross salary at Architect is Rs. 88,175. The maximum salary at this level is Rs. 250,000 and the minimum is Rs. 40,000. A standard deviation (variation in salaries) of Rs. 39,514 exists at this level. The Skewness of 0.86 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 5.6 shows that the distribution is peaked relative to the normal.

Fig 2.2.1



Mean	88174.9
StDev	39513.8
Skewness	2.15881
Kurtosis	5.67859
N	37
Minimum	40000
1st Quartile	63250
Median	80000
3rd Quartile	95250
Maximum	250000

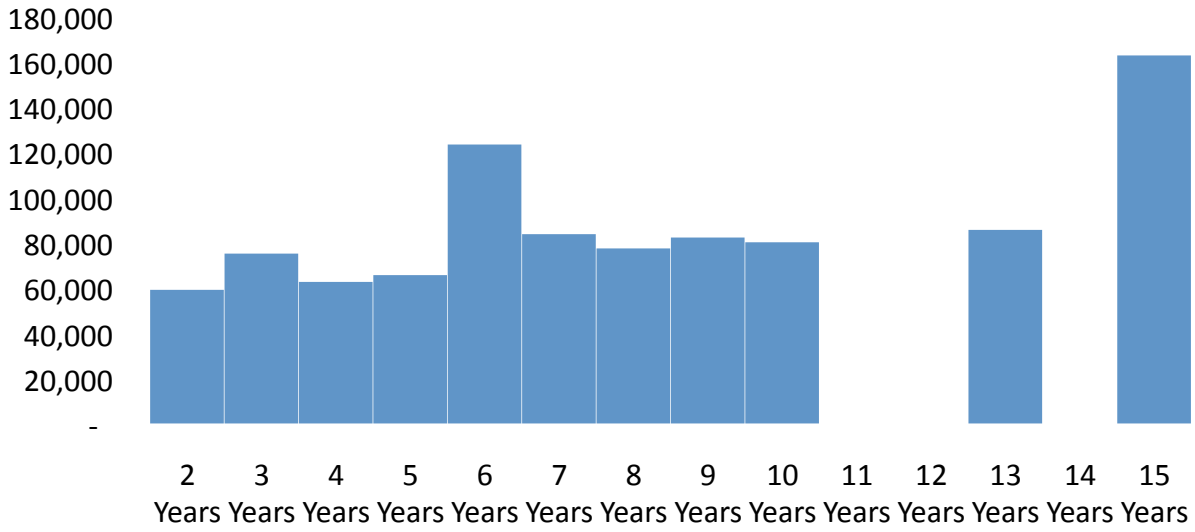
95% Confidence Interval for Mu

75000	101349

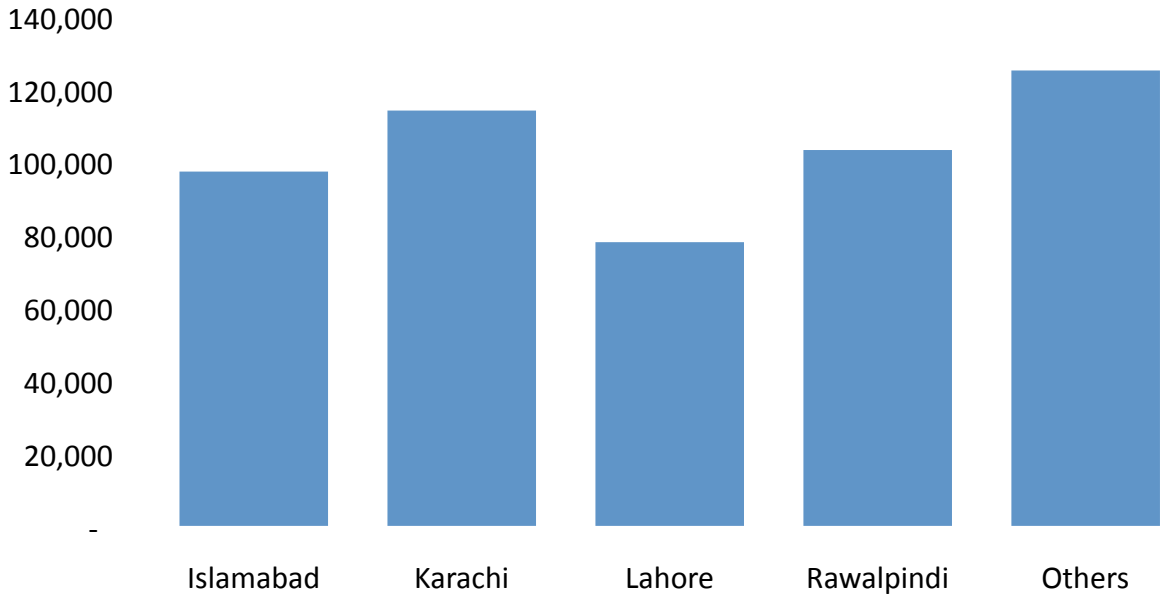
95% Confidence Interval for Median

70504	87295

2.7.2 Experience Wise Salary Structure of Architects



2.7.3 City Wise Salary Structure of Architects



2.8 Role Definition of Database Administrator

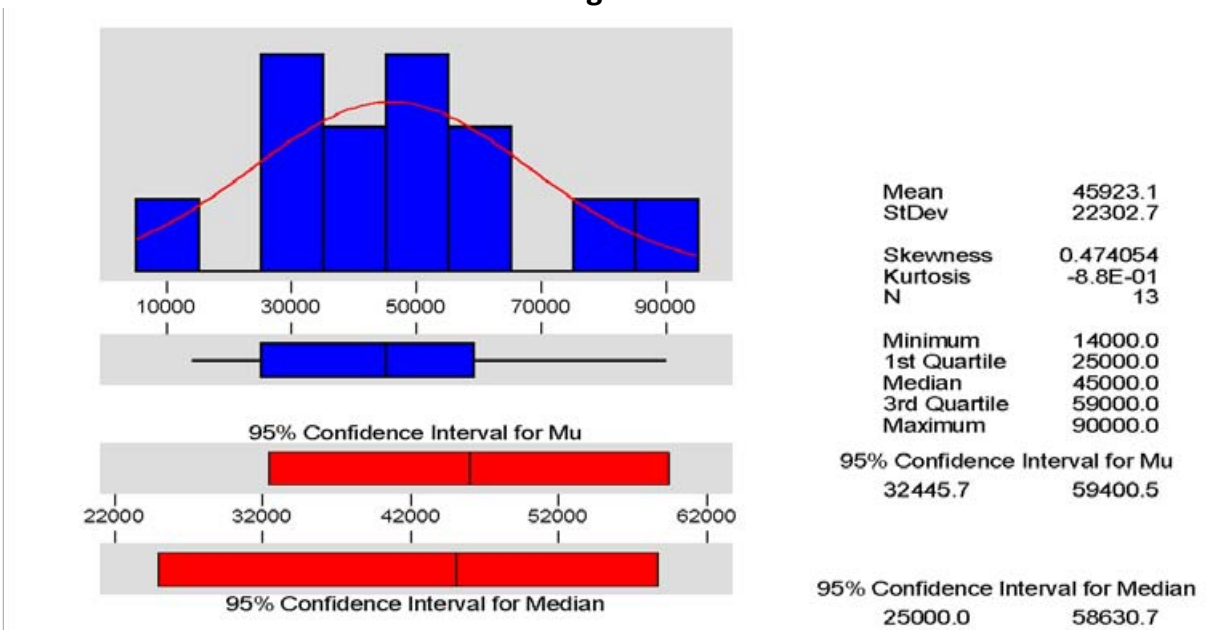
Database Administrator performs the following activities: Develop database architecture and coding standards, Keep abreast of latest techniques and features in databases, and how they relate to the company's goals, Respond to and resolve database related access, performance and integrity issues of developed applications, Ability to monitor database system details within the database, including stored procedures and execution time, and implement efficiency improvements, Review and approve database designs and make recommendations to project teams, Perform database transaction and security review of

applications, Establish and implement best practices in database design, architecture and programming, Provide expert consultancy to project teams on database related programming and production issues, Prepare training courses and conduct training for staff, Knowledge of several database RDBMS including SQL Server and Oracle, and know their fine print differences.

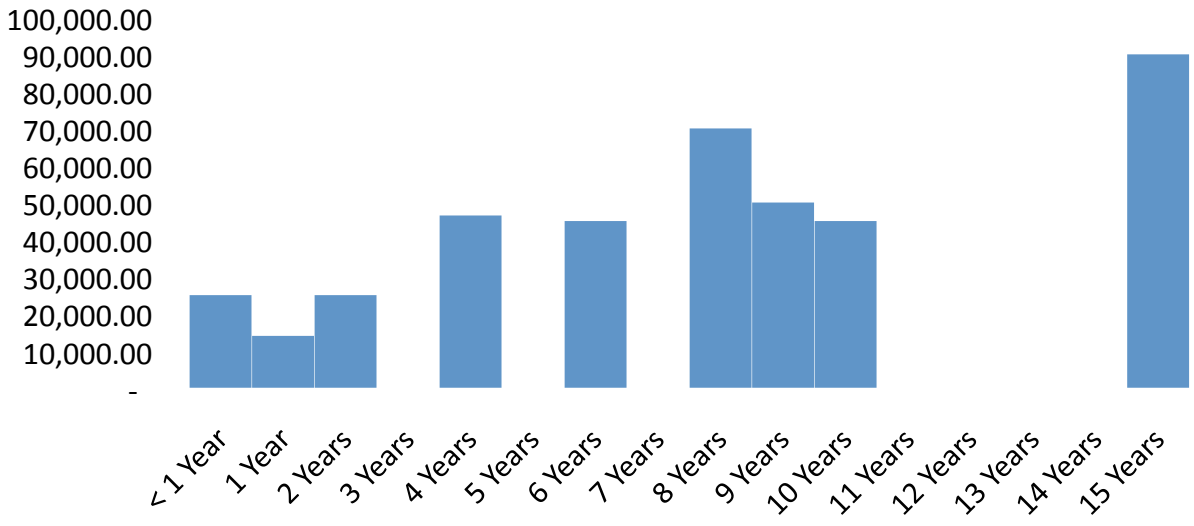
2.8.1 Salary Structure of Database Administrator

As shown in the Fig 2.2.2 that the average gross salary at database administrator is Rs. 45,923. The maximum salary at this level is Rs. 90,000 and the minimum is Rs. 14,000. A standard deviation (variation in salaries) of Rs. 22,303 exists at this level. The Skewness of 0.47 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis -8.8E shows that the distribution is flat relative to the normal.

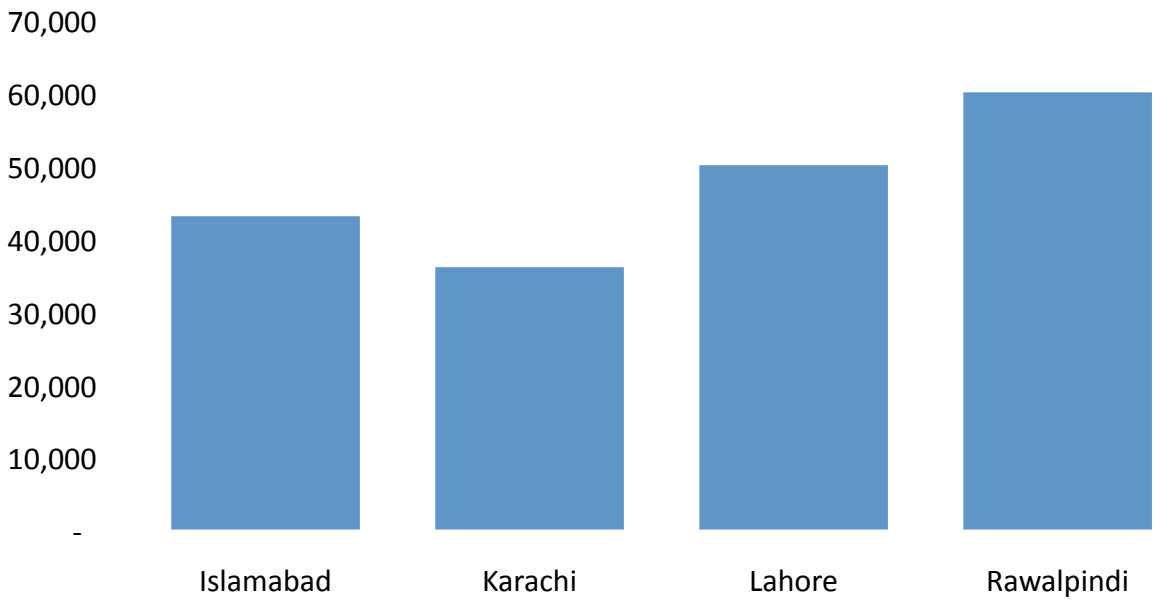
Fig 2.2.2



2.8.2 Experience Wise Salary Structure of Database Administrators



2.8.3 City Wise Salary Structure of Database Administrators



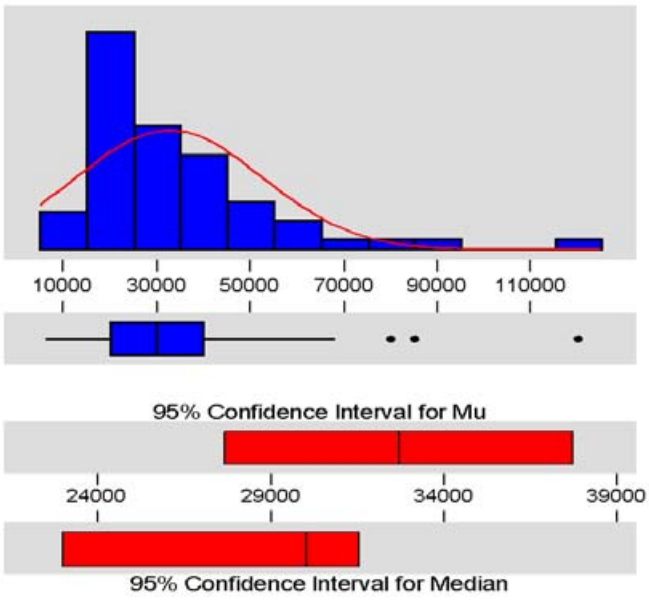
2.9 Role Definition of System Administrator

A system administrator is a person employed to maintain and operate a computer system and/or network. System administrators are usually charged with installing, supporting, and maintaining servers or other computer systems, and planning for and responding to service outages and other problems. Other duties may include scripting or light programming, project management for systems-related projects, supervising or training computer operators, and being the consultant for computer problems beyond the knowledge of technical support staff.

2.9.1 Salary Structure of System Administrator

As shown in the Fig 2.2.3 that the average gross salary at system administrator is Rs. 32,707. The maximum salary at this level is Rs. 120,000 and the minimum is Rs. 6,000. A standard deviation (variation in salaries) of Rs. 19,754 exists at this level. The Skewness of 1.90 indicates that the distribution is positively skewed as compare to zero for normal. The Kurtosis 5.01 shows that the distribution is flat relative to the normal.

Fig 2.2.3



Mean	32707.0
StDev	19754.2
Skewness	1.90630
Kurtosis	5.01045
N	62
Minimum	6000
1st Quartile	20000
Median	30000
3rd Quartile	40000
Maximum	120000

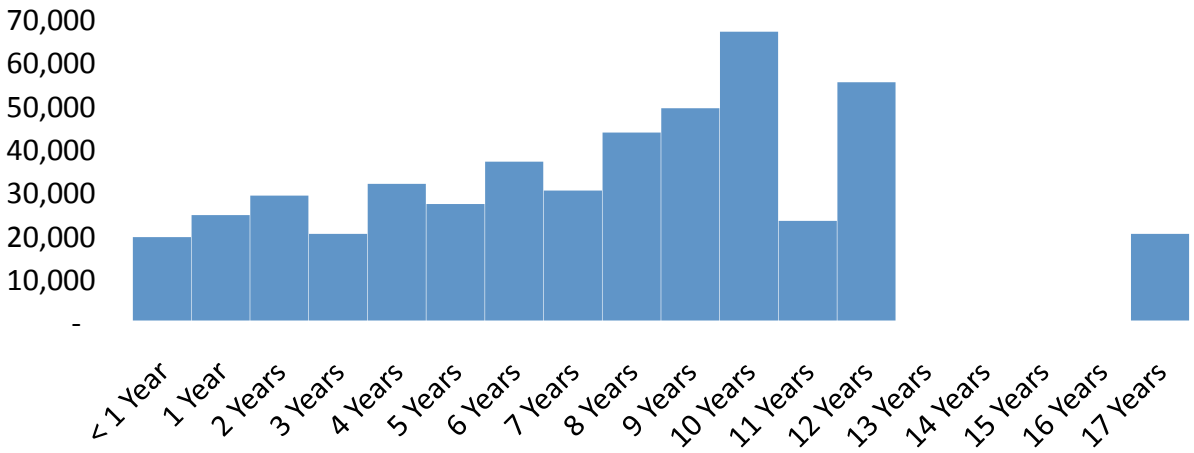
95% Confidence Interval for Mu

27690	37724

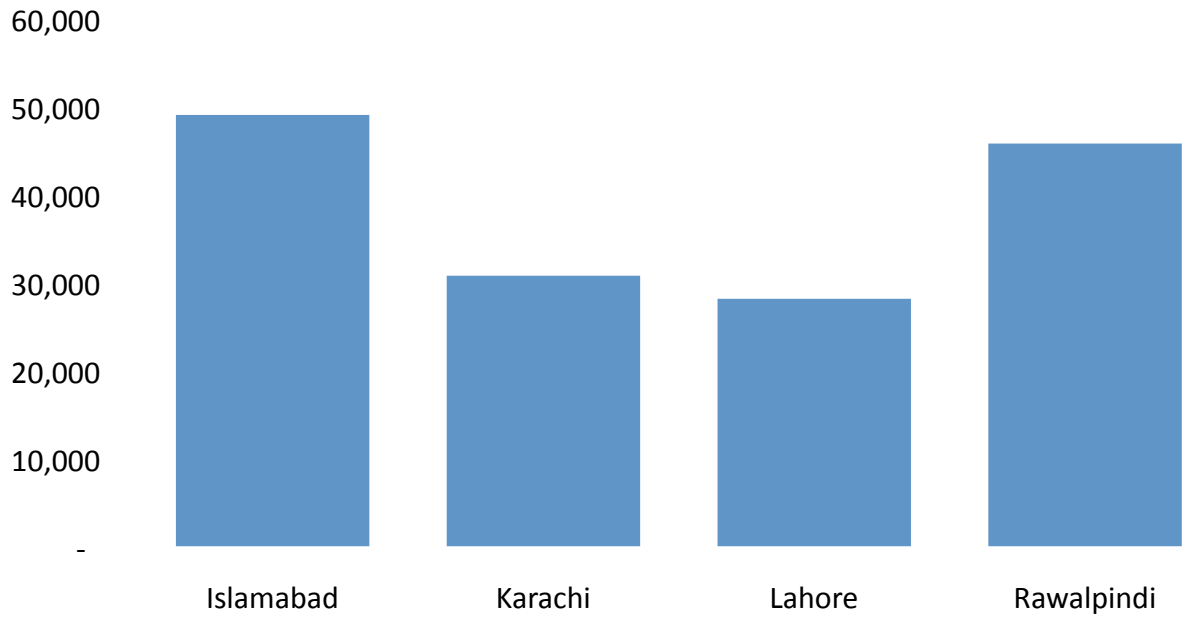
95% Confidence Interval for Median

23000	31518

2.9.2 Experience Wise Salary Structure of System Administrators



2.9.3 City Wise Salary Structure of System Administrators



3 STATISTICAL SUMMARIES OF CROSS TABULATIONS

3.1 Statistical Summary of Salary Structure by Experience

	Total	Experience - Up to 2 years				Experience - 2.01 to 5 years				Experience - more than 5 years			
		Count	Mean	Median	Std. Deviation	Count	Mean	Median	Std. Deviation	Count	Mean	Median	Std. Deviation
Total	1389	482	29,138	25,000	15,062	502	40,266	35,000	17,998	405	64,165	55,000	32,753
Programmer	761	332	28,264	26,500	9,617	281	38,986	35,000	13,082	148	49,743	49,000	13,434
Quality Assurance	291	100	24,890	24,000	6,764	131	34,510	33,000	9,553	60	48,583	47,000	18,118
Graphics Designer	31	*7	26,143	25,000	6,388	*13	36,154	35,000	11,575	*11	55,500	50,000	22,259
Technical Writer	*20	*5	28,000	24,000	13,342	*7	32,714	30,000	12,553	*8	61,563	54,750	31,584
Product Manager/Business Analyst	66	*12	36,667	35,000	18,802	*21	65,750	60,000	38,245	33	64,591	68,000	26,743
Development Manager	*20	*5	64,000	70,000	8,944	*1	75,000	75,000	.	*14	111,740	111,180	40,618
Project Manager	88	*6	125,000	117,500	24,900	*14	82,375	76,500	28,670	68	99,074	95,900	29,346
Architect	37		.	.	.	* 9	64,444	60,000	12,451	*28	95,803	84,735	42,282
Database Administrator	*13	*4	22,250	25,000	5,500	*2	46,500	46,500	16,263	*7	59,286	50,000	18,803
System Administrator	62	*11	22,727	22,000	9,768	*23	28,797	30,000	11,399	*28	39,839	30,500	25,180

3.2 Statistical Summary of Salary Structure by Experience-I

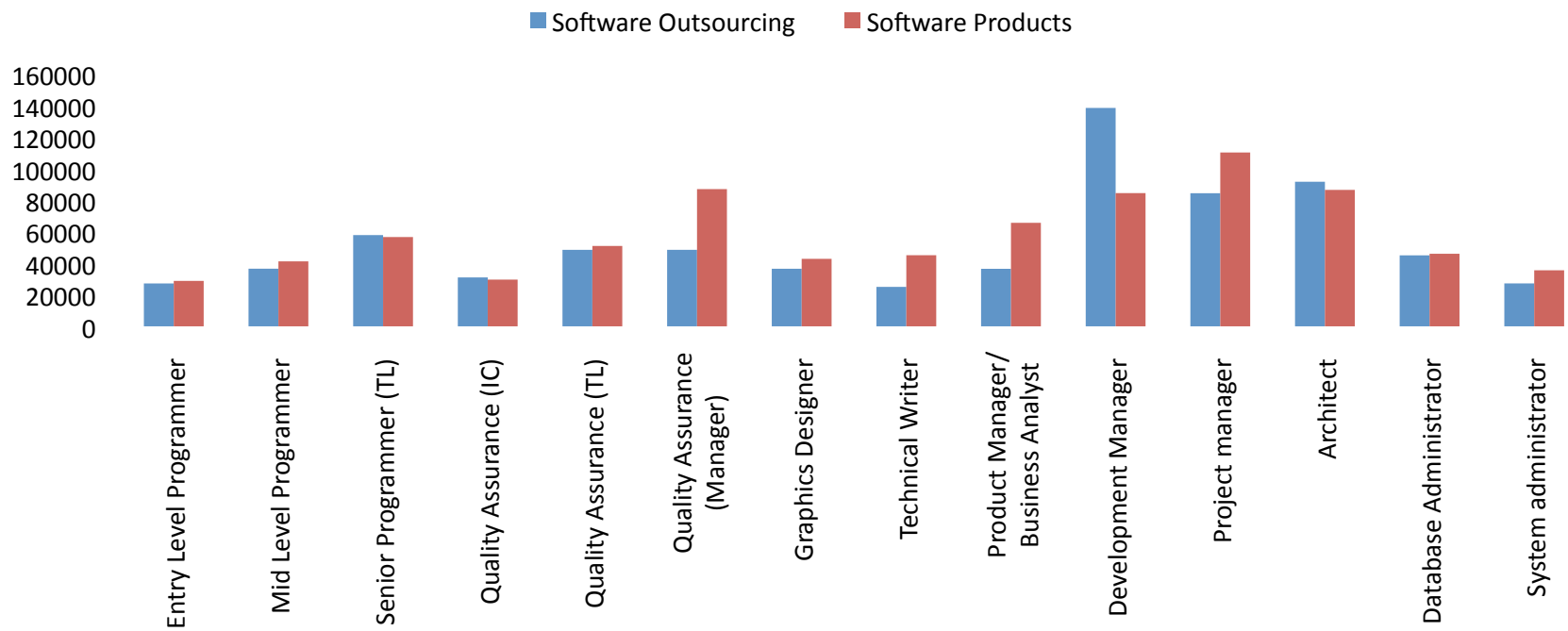
	Total	< 1 Year	1 Years	2 Years	3 Years	4 Years	5 Years	6 Years	7 Years	8 Years	9 Years	10 Years
Total	43,333	31,431	26,148	31,832	35,929	43,501	47,507	56,923	58,247	62,565	73,686	77,186
Programmer	36,400	28,202	25,973	31,950	35,689	42,995	48,534	50,164	54,319	46,708	51,125	50,111
Quality Assurance	34,106	22,481	23,692	27,688	32,810	38,667	39,458	46,880	50,214	60,600	57,000	88,500
Graphics Designer	40,758	26,000	22,500	35,250	33,333	31,667	35,667	45,333	55,000	80,000	42,500	85,750
Technical Writer	43,075	50,000	20,000	24,000	31,500	49,000	27,250	57,000	.	77,250	.	82,500
Product Manager/Business Analyst	59,883	44,167	23,600	55,875	55,300	83,036	53,833	49,571	50,000	62,875	80,500	87,000
Development Manager	97,968	64,000	.	75,000	.	.	60,000	67,333	.	112,500	100,000	120,000
Project Manager	98,185	130,000	115,000	90,000	75,000	76,125	85,750	90,688	101,700	95,444	99,050	95,222
Architect	88,175	.	.	59,000	75,000	62,500	65,500	123,167	83,583	77,286	82,100	80,000
Database Administrator	45,923	25,000	14,000	25,000	.	46,500	.	45,000	.	70,000	50,000	45,000
System Administrator	32,707	19,250	24,333	28,833	20,000	31,545	26,889	36,667	30,000	43,389	49,000	66,667

3.3 Statistical Summary of Salary Structure by Experience-II

	11 Year	12 Years	13 Years	14 Years	15 Years	16 Years	17 Years	19 Years	21 Years	24 Years	26 Years	28 Years	30 Years
Total	81,727	87,472	107,094	110,000	122,222	59,000	54,000	135,000	65,000	100,000	115,000	110,000	120,000
Programmer	50,500	65,000	.	.	68,000	41,500	.	.	.	.	.	.	.
Quality Assurance	.	35,000	.	.	47,000	.	.	.	.	.	.	.	.
Graphics Designer	.	.	.	.	.	63,000	.	.	.	.	.	.	.
Technical Writer	.	.	.	.	.	.	.	.	.	.	.	.	.
Product Manager/Business Analyst	74,000	65,000	80,000	.	.	.	.	.	.	.	.	.	.
Development Manager	156,180	.	150,000	155,000	130,000	.	.	.	.	.	.	110,000	.
Project Manager	88,000	113,450	110,000	65,000	146,667	90,000	71,000	135,000	65,000	100,000	115,000	.	120,000
Architect	.	.	85,470	.	162,500	.	.	.	.	.	.	.	.
Database Administrator	.	.	.	.	90,000	.	.	.	.	.	.	.	.
System Administrator	23,000	55,000	.	.	.	.	20,000	.	.	.	.	.	.

3.4 Statistical Summary by Type of Organization Profile

	Total			Software Outsourcing			Software Products		
	Count	Mean	Std Deviation	Count	Mean	Std Deviation	Count	Mean	Std Deviation
Total	1,389	43,333	26,598	480	41,642	24,662	909	44,226	27,537
Entry Level Programmer	332	28,264	9,617	110	27,186	7,400	222	28,798	10,519
Mid Level Programmer	353	39,565	12,162	123	36,533	9,863	230	41,186	12,960
Senior Programmer (TL)	76	57,246	13,688	39	57,850	11,684	37	56,608	15,667
Quality Assurance (IC)	244	30,109	8,707	86	31,000	8,057	158	29,623	9,029
Quality Assurance (TL)	38	49,982	11,510	15	48,489	5,901	23	50,957	14,076
Quality Assurance (Manager)	8	77,375	25,065	2	48,500	4,950	6	87,000	20,736
Graphics Designer	31	40,758	19,121	*10	36,500	15,778	*21	42,786	20,567
Technical Writer	*20	43,075	26,420	*2	25,000	-	*18	45,083	27,155
Product Manager/Business Analyst	66	59,883	31,366	*13	36,462	19,675	53	65,627	31,140
Development Manager	*20	97,968	40,209	*5	138,472	39,218	*15	84,467	31,202
Project manager	88	98,185	30,201	41	84,390	25,211	47	110,219	29,237
Architect	37	88,175	39,514	*12	91,667	39,638	*25	86,499	40,161
Database Administrator	*13	45,923	22,303	*1	45,000	.	*12	46,000	23,293
System administrator	62	32,707	19,754	*21	27,206	10,413	41	35,524	22,735


Software Outsourcing
Software Products
160000
140000
120000
100000
80000
60000
40000
20000
0
Entry Level Programmer
Mid Level Programmer
Senior Programmer (TL)
Quality Assurance (IC)
Quality Assurance (TL)
Quality Assurance (Manager)
Graphics Designer
Technical Writer
Product Manager/ Business Analyst
Development Manager
Project manager
Architect
Database Administrator
System administrator

3.5 Statistical Summary of Salary Structure by Cities

	Islamabad			Rawalpindi			Karachi			Lahore			Others		
	Count	Mean	Std Deviation	Count	Mean	Std Deviation	Count	Mean	Std Deviation	Count	Mean	Std Deviation	Count	Mean	Std Deviation
Total	88	49,205	29,181	113	45,666	28,537	339	45,381	31,421	842	41,592	23,567	*7	42,143	37,051
Entry Level Programmer	27	28,296	9,089	37	26,939	7,526	105	29,481	9,745	159	27,832	10,128	4	25,500	4,435
Mid Level Programmer	6	34,250	11,462	24	44,615	12,661	58	40,362	11,144	263	39,092	12,299	2	34,000	8,485
Senior Programmer (TL)	4	55,875	20,690	3	70,000	7,550	28	59,750	12,423	41	54,736	13,746			
Quality Assurance (IC)	6	27,500	7,635	19	32,974	8,672	55	29,818	7,606	164	29,970	9,084		.	.
Quality Assurance (TL)	2	62,500	10,607	2	68,000	2,828	9	47,778	9,203	25	48,333	11,235		.	.
Quality Assurance (Manager)	3	87,333	34,078		.	.	4	78,000	15,578	1	45,000	.		.	.
Graphics Designer	*5	48,000	20,797	*1	101,500	.	*8	41,500	15,547	*17	34,706	13,619		.	.
Technical Writer	*6	64,167	37,472	*3	41,833	23,272	*3	29,333	4,041	*8	32,875	12,264		.	.
Product Manager/Business Analyst	*3	48,333	17,559	*2	62,125	11,137	*15	68,333	51,928	46	57,783	22,985		.	.
Development Manager	*3	93,333	25,166	*2	132,500	31,820	*3	120,000	39,686	*12	87,863	42,809		.	.
Programmer	37	32,243	13,711	64	35,586	14,969	191	37,223	14,903	463	36,610	14,014	*6	28,333	6,743
Architect	*4	97,250	38,257	*3	103,167	14,597	*5	114,000	76,135	*24	77,874	29,462	*1	125,000	.
Database Administrator	*5	43,000	23,076	*1	60,000	.	*2	36,000	31,113	*5	50,000	24,238		.	.
System	*5	49,000	21,036	*8	45,750	34,895	*15	30,733	10,505	34	28,113	16,050		.	.

Administrator															

3.6 Statistical Summary of Salary Structure by Organizations Size

Roles	UP TO 100 EMPLOYEES		101 TO 250 EMPLOYEES		MORE THAN 250 EMPLOYEES		Total	
	Count	Mean	Count	Mean	Count	Mean	Count	Mean
Entry Level Programmer	147	29539	8	24125	177	27392	332	28264
Mid Level Programmer	72	43628	3	44000	278	38464	353	39565
Senior Programmer	37	61734	3	67667	36	51764	76	57246
Quality Assurance (IC)	59	30703	5	25400	180	30044	244	30109
Quality Assurance (TL)	13	48333	2	55000	23	50478	38	49982
Quality Assurance (Manager)	7	75571	1	90000		.	8	77375
Graphics Designer	22	41841	1	28000	8	39375	31	40758
Technical Writer	9	58389	1	30000	10	30600	20	43075
Product Manager/Business Analyst	11	81295	2	125000	53	52981	66	59883
Development Manager	8	114045	1	75000	11	88364	20	97968
Project Manager	36	95786		.	52	99846	88	98185
Architect	14	108250		.	23	75955	37	88175
Database Administrator	10	43700		.	3	53333	13	45923
System Administrator	22	42197		.	40	27488	62	32707

4 ELEMENTS FOUND CONTRIBUTING IN VARIATIONS

4.1 Reasons for Major Differences in Salaries

The salary data for the benchmarked positions shows considerable difference across the comparable organizations, both in the average and the maximum salary limits.

There are no significant differences found for salary structures between software product development companies and software outsourcing companies. However, outsourcing companies are paying somewhat higher salaries on most of the positions.

There appear to be five major factors contributing to this difference.

1. Some organizations are paying more than industry average on each level irrespective of experience. The reason seems that they are hiring candidates from top notch universities or with higher level certifications.
2. The responsibilities vary across the comparable organizations. For instance, a benchmarked position could be coordinating a countrywide operation at one end of the spectrum and may hold a desk job at the other.
3. The new established organizations are generally paying more than older organizations because they need a more talented people because of less knowledge base and the matured systems in place.
4. Large organizations are paying fewer salaries especially on lower levels because of the charm of getting the exposure and the experience curve for fresh candidates.
5. Due to cost of living difference there is variation in salary structures between the target cities.

5 BENEFITS AND ALLOWANCES

5.1 Non-Monetary Benefits

The non-monetary benefits are not uniform across the Industry and this differentiates for large, medium and small sized organizations. P@SHA for the purpose of this assignment, have considered provision of motor vehicles, fuel, mobile phones under this category of benefits. 25% managers and 2% team leads have been provided cars either via employer-owned or leased facilities.

5.2 Employee Bonus

63% of organizations are providing different type of bonuses to their employees such as 1 month gross / basic salary or performance based bonus. Also there is variation in bonus frequency i.e. annual or biannual basis.

5.3 Gratuity

Very few organizations have such schemes for their employees, only 5% i.e. 1 out of 19 companies of the covered sample size offer gratuity schemes. Where such schemes exist, companies generally contribute one to two gross / basic salaries per year to the gratuity fund. Gratuity and provident fund do not go together in any of the observed organizations.

5.4 Provident Fund

Similar to the Gratuity Schemes, policies on provident fund scheme vary across the industry. It is observed that only 42% (8 companies) of covered sample size offer Provident Fund Schemes. Generally the allowances are merged with the basic salaries in order to provide higher matching contributions from the employers.

5.5 Health Insurance / Medical

Most of the software development organizations are paying health insurance facility to their employees. Some organizations provide medical benefits in the form of cash allowances as well as health insurance with an upper limit. These organizations also reimburse outpatient medical treatment costs.

5.6 Benefits and Allowances Summary

		Health Insurance	Provident Fund	Gratuity	Employee Bonus
	Total (Counts)	Yes (15)	Yes (8)	Yes (1)	Yes (12)
Total	19	79%	42%	5%	63%

5.7 Car Facility Summary

Manager		Team Lead	
Total	Have Car (27)	Total	Have Car (3)
107	25%	187	2%

6 ANNEXURE

6.1 TOOLS FOR ANALYSIS

To analyze the data obtained in bands of gross salary and variation thereof Oasis used different central tendency measurement tools. For measuring central tendency, two elements were considered: firstly, the averages should represent the pragmatic figures encircling the maximum and minimum values within the range of data, and secondly, it should remain unchanged by a rearrangement of the observations in a different order. For this purpose we used these statistical tools for analysis.

6.1.1 Mean / average

The arithmetic mean or simply the mean is the most familiar average. It is defined as a value obtained by dividing the sum of the all the observations by their number. It is denoted by x and calculated by the following formula.

$\overline{x} = M = \frac{\sum_{1} x}{N}$ Where i= 1, 2, 3……, n. & $\sum$, the Greek capital *sigma*, is a convenient symbol for summation and N is total number of observations.

Example: If our x values are 10, 15, 20, 25, 30, 35, 40 what is our mean?

We can calculate it using the above formula.
∑Xi = 10+15+20+25+30+35+40=
X = 175/7= 25 here 25 in a value which represent all the data

6.1.2 The Median

The median is defined as a value which divides a set of data in to two halves, one half compromising of observations greater than and the other half smaller that it. Or more precisely, the median is a value at or below 50% of the data lie.

Thus the sample median of the n observations X1, X2, X3,…..,Xn when arrange in order from smallest to largest or vice versa.

When n/2 is not an integer the median is {(n+1)/2}th observation and when n/2 is an integer, the median is the average of n/2 and {(n+1)/2}th observations.

The median is a robust measure of the center of the distribution that is less sensitive to outliers than the mean.

6.1.3 Max and Min

The maximum value is the largest value appears in data and minimum value is the smallest value in the data.
For example in above serious 45 is the maximum and 10 is min value.

6.1.4 Variance/Standard Deviation

The variance of a set of observations is defined as the mean of the squares of deviations of all the observations from their mean.
It is the key measure that we want to use. The critical thing when we look at the dispersion of scores is how much they differ, how much spread there is around the mean.

- **Deviation of scores from the mean** $\sum (x - \bar{x})$
- **Sum of squares** $= \sum (x - \bar{x})^2$
- **Variance** $= s^2 = \frac{\sum (x - \bar{x})^2}{N}$

Where 6 $^{X-X}$ is the subtraction of the mean from each score. If you use a mean as a focal point and subtract that from every score the sum will always be zero.

The variance is also denoted by Var (X). The term variance was introduced in 1918 by R.A. Fisher (1890-1962).

To know the deviations we will use the sum of squares. Using the sum of squares if I want to compare distributions is problematic since sample size is not the same. I want a measure of variance that allows me to compare class to class, group to group where the sample sizes might be different.

The statistic that is more valuable for interpretation is standard deviation, which is the square root of the variance underroot s2 . The standard deviation is expressed in the same unit as the observations themselves. Karel Pearson (1857-1936) “founder of the science of statistics” It is a measure of dispersion or spread in the series. It is given by:

$$\text{S.D} = \sqrt{s^2} = \sqrt{s^2 = \frac{\sum (x - \bar{x})^2}{N}}$$

Where N is the number of observations in the current sample.

6.1.5 Skew-ness:

A distribution in which the values equidistant from the mean have equal; frequencies, is defined to be symmetrical and any departure from symmetry is called skew-ness.

It is a measure of asymmetry of the distribution of the series around its mean. The skewness of a symmetric distribution, such as the normal distribution, is zero. Positive skewness means that the distribution has a long right tail and negative skew-ness implies that the distribution has a long left tail. For a positively skewed distribution, mean> median> mode and in a negatively skewed distribution, mode> median> mean. A mathematical expression of Skewness is as follows:

$$S = \frac{1}{N-1} \sum_{i=1} \left(\frac{X_i - \overline{X}}{\sigma} \right)^3$$

6.1.6 Kurtosis:

Karl Person (1857-1936) introduced the term Kurtosis for the degree of peakedness or flatness of a unimodal frequency curve.
It measures the peakness or flatness of the distribution of the series. Kurtosis is computed as where is based on the biased estimator for the variance (Bickel and Doksum 1977, p.388). The kurtosis of the normal distribution is 3. If the kurtosis exceeds 3, the distribution is peaked (leptokurtic) relative to the normal; if the kurtosis is less than 3, the distribution is flat (platykurtic) relative to the normal.

$$K = \frac{1}{N-1} \sum_{i=1} \left(\frac{X_i - \overline{X}}{\sigma} \right)^4$$

6.1.7 Histograms

This view displays the frequency distribution of your series in a histogram. The histogram divides the series range (the distance between the maximum and minimum values) into a number of equal length intervals or bins and displays a count of the number of observations that fall into each bin. A complement of standard descriptive statistics is displayed along with the histogram. All of the statistics are calculated using observations in the current sample. Mathematically, the curve is represented by the relation y=f(x) and has a great importance property concerning its area.

6.2 Application Software Used for Analysis:

Three type of application software's were used to analyze the data

1) Microsoft Excel version 2007 for data classification into tabular form.
2) Minitab for graphs outputs
3) SPSS for advance analysis of data

Mean, Median, Standard Deviation, Maximum, Minimum, Skewness, Kurtosis and Histograms are obtained with the help of these softwares.