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National ICT R&D Fund



Ministry of Information Technology, Pakistan



RSM Avais Hyder Liaquat Nauman **Chartered Accountants**



PAKISTAN IT & ITES

INDUSTRY SURVEY 2014

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EXECUTIVE SUMMARY

Pakistan, a developing economy, is ranked 129th among 144 countries in the Information Technology (IT) sector according to the World Economic Forum (2014). Information Technology - the study, design, implementation, support or management of computer-based information systems, particularly software applications and computer hardware - is a vast field that encompasses all aspects of the global world today. Be it for healthcare, integrating schools and their curriculum, information exchange nationwide or internationally, or even as complex as controlling a drone from miles away, technology has surpassed what a couple decades ago stood far-fetched milestones. Pakistan has been an agriculture based economy since the beginning. In the last decade, however, political instability and factors like war on terror have negatively affected the direction of our economy on the whole. No rigorous policies have been in place as there has been lack of clarity in the priorities with every government issuing a new mandate. This has resulted in aggravated impact on the economy's relatively poor performance over the years. Considering the impact of Information Technology globally, and especially its role play in our economy in the last decade, this survey report concludes that IT & ITES is, indeed, a fast growing industry with a lot of scope and numerous opportunities open to explore and excel in. Perhaps, given the current situation and standing of the economy, now would be the right time to prioritise and encourage this industry; hence, penetrating into the service sector which has been a key success factor for many developing economies like India and Bangladesh.

The IT & ITES Industry seems to be a rapidly growing industry, proving to be a major factor in the improvement of the economic growth of Pakistan. In this regard, hence, National ICT R&D Fund intended to conduct a thorough survey in order to assess the Industry, its key features and issues being faced that may fetter its growth at its true potential. RSM Avais Hyder Liaquat Nauman conducted this survey on behalf of National ICT R&D Fund, wherein, a sample of 300 IT & ITES Companies was selected. This survey reveals a growth of 23% in the number of companies operating within this sector, with an average estimated revenue growth of 29% in the industry over the last 3 years. Majority of the respondents saw growing international market for their business, with Mobile Application Development, Web Application Development and Software Development being the most flourishing aspects within the industry. Hence, it can be deduced that with government support and the provision of basic fundamental platforms, this industry has a lot of scope that would aid in the economic health of the country. The actual size of the Industry cannot, however, be drawn from our survey conducted. To ascertain the total number of companies, a thorough mapping exercise should be conducted.

There is no apex body to govern and regulate the IT & ITES Industry, or which could aim to provide different platforms to bridge the gap between the industry and academia. There is a lack of adequate Human Resource required to maintain and improve the standing of the industry on the whole. This is majorly reflected by the high turnover of employees in the industry. Also, there is a clear lag between the requirements of professionals holding relevant expertise and certifications such as the Cisco, Oracle, PHP and .NET. Services like Mobile Application Development have been identified as one of the most lucrative, but our industry lacks the apt experience relevant for such; ensuring these certifications and expertise, would add to the credibility of the personnel and enhance the overall structure and standing of the industry. Furthermore, quality assurance is a significant hurdle that hinders various business opportunities. For any industry to flourish, government plays a vital role. Without government support, an industry. A regulating body put in place would act as a facilitator, attending to all the gaps identified.

This survey report highlights the key issues that are faced by this fast growing industry - factors that may hinder the true potential of IT & ITES industry in Pakistan, and those that may be lacking and are holding the industry from excelling at its maximum. These key issues are raised and discussed in detail in our report for comprehensive understanding. To conclude for an overview, it is imperative to understand that the security issues and the power and electricity dilemma faced by Pakistan through the last decade have caused a major hindrance in the operations and running of all industries within the economy. These being far more integral in the IT & ITES Industry, as it is a service sector and requires uninterrupted power supply, with a secure environment to ensure easy and steady access to the international market.

Given the current standing of the IT & ITES Industry and the survey findings in this report, Pakistan's economy has seen a paradigm shift in terms of the increase in total GDP contribution, job creations and capital influx. With the growing trends in the industry, it has a long way to go; and paid the right attention with rectified measures taken, as suggested later in the report, would attract large foreign investment opportunities.

Section 01

Introduction

Project Rationale, Scope of Work, Our Legal Arrangement

Established by the Ministry of Information Technology in January 2007, the National ICT R&D Fund aims to support research and development projects proposed by the industry and academia. The Government of Pakistan desires that a certain percentage of gross revenue generated by all telecom service providers be allocated to research and development of information and communication technologies in an effort to transform Pakistan's economy into a knowledge based one.

There is no doubt that Pakistan's IT & ITES industry has matured into becoming an integral part of the economy; however, there is still a lack of credible and authentic data essential for the evaluation of the industry and designing of policies and initiatives necessary to help the industry move forward.

In order to help the IT & ITES industry flourish, the Fund has initiated an effort to collect relevant data necessary for analysis, policy making and identification of trends in the industry, so that appropriate initiatives may be taken. To accomplish this objective, National ICT R&D Fund has hired the services of Avais Hyder Liaquat Nauman (AHLN) Chartered Accountants, member firm of the RSM International – the 7th largest network on independently owned and managed firms in the world.

1.1.Scope of Work

The scope of this assignment for collection of credible data on the IT and ITES industry included the following:

- Design of survey instrument and corresponding database application for data entry, storage and analysis.
- Determination of sample size and sampling strategy.
- Recruitment and training of enumerators (Paid professionals were employed for conducting the survey. Use of volunteers is disallowed).
- Pilot testing of survey instrument.
- Finalization of instrument.
- Deployment of field staff to conduct industry survey and documentation of case studies.
- Data cleaning, compilation and analysis
- Report writing including conclusions and recommendations

1.2. Execution Methodology

This section lists down the roadmap to different activities conducted by the Consultants, necessary to achieve the overall objectives of the assignment. Our overall methodology was driven on the success we have been able to achieve on similar engagements. Accordingly, our methodology was divided in different phases. The details of each phase are given below:

Phase 1: Diagnostic Review

This phase involved key data collection (primary) that included, **size of industry** domestic, and export, by sector and destination, size of companies, verticals, **work force**, export-oriented, skill, tools, and platforms), **output mix** (services, products), growth-rates, cost base etc.

Geographical Coverage

For the determination of Universe for this survey, it was anticipated that PSEB & PASHA, being the apex bodies would have updated lists of the IT & ITES industry. However, after considerable efforts, it was found that IT & ITES industry lists at aforementioned forums were either not coherent or not updated. Alternatively, for the determination of universe information, Securities and Exchange Commission of Pakistan (SECP) was used. As a result, a population of over a thousand companies was determined by sorting IT & ITES companies' lists at PSEB, PASHA and SECP. A list of sample companies is attached as Annex II.

To cater for appropriate geographical coverage, the following two approaches were adopted:

- Purposive selection of cities
- Random selection of cities / towns

Purposive Selection

A quick review of the currently registered companies with PASHA / PSEB etc. showed that the concentration of IT & ITES companies within the country lies in the top three cities, namely Karachi, Lahore and Rawalpindi / Islamabad. We, therefore, adopted a purposive selection for the top 6 cities of the country as listed below:

- Karachi
- Lahore
- Rawalpindi / Islamabad
- Peshawar
- Faisalabad
- Multan

Random Selection

To have a representation of medium to small towns, we adopted a Stratified Random Selection procedure with 'Population' as the stratification criteria. We concentrated on the following two strata:

- a. Cities & towns with population > 0.5 million (excluding those cities which are purposively selected)
- b. Cities & towns with population 0.1 million to 0.5 million

Note: Smaller cities with populations less than 0.1 million were excluded as the probability of finding a valid respondent in such cities was negligible.

We selected 'Four' cities from strata (a) and 'three' from strata (b)

Total Number of Cities Selected

The total no of cities selected for this survey were 10 (6 purposively selected and '4' randomly selected).

Sample Size

One of the key determinants of sample size for this assignment was the 'coefficient of variation' found in the 'Universe'. Since we covered all types of large, medium & small companies through the survey, it was expected that the coefficient of variation would be on the higher side. We kept it at 0.40. The other determinant of the sample size was the desired 'Precision' that we wanted to obtain from the results of the survey. Usually such 'Precision' is kept at 0.05 (or $\pm 5\%$). For this survey, we reduced it down to 0.04 (or $\pm 4\%$). Henceforth, using these sampling parameters and working on the basis of a 95% significance level, the sample size 'n' for this survey worked out to be in the range of 300-350.

Sample Selection Procedure

The following two procedures were adopted for sample selection:

- Random selection from a 'Universe' which was compiled using the available lists of the registered companies with PASHA / PSEB. 70% of the 'n' i.e. '200-245' companies were selected in this way.
- Snowball Sampling: For the remaining 100-105 companies which were expected to be located in the medium to small towns, we used the 'Snowball Technique', whereby, the valid respondents were located through interviewing the knowledgeable people related to the industry.

Field Plan

Survey Instrument

A structured questionnaire¹ was prepared in view of the assignment given by the client. The questionnaire included both, open–ended and close-ended / multiple choice questions. The questionnaire was finalised after a thorough pretesting.

Selection & Formation of field Teams

We deployed capable staff to carry out survey field work. Our staff, having extensive prior experience in similar kind of field work, were deployed in the areas they belong to; thus, they possessed thorough knowledge of the local surroundings. Each team comprising of skilled interviewers was headed by an experienced supervisor, who was responsible for maintaining the required pace of work and the desired quality level. A master protocol of communication flow from field to the head office was also devised in order to ensure close monitoring of activities.

Field Training

After the regional teams were formed, special training sessions were conducted in Rawalpindi, Lahore, Multan, Karachi and Hyderabad to impart detailed knowledge of the finer aspects of this survey to all the field personnel. These training

¹ Annex III

sessions were conducted by experienced and senior level field trainer. A training guide was developed for these training sessions, jointly by the research executive and the field trainer, and contained all the necessary details needed by the interviewers to perform their job properly. Each training session was followed by mock interviews supervised by the respective team leaders.

Field Accompaniment

Each team leader (supervisor) was required to accompany each member of his team at least once. This was done in cycles so that once he had completed one round, he would start all over again. This process is a quality control measure and the purpose was to make sure that the field interviewers were following the given instructions.

Back Checking

Despite taking meticulous care at all stages of the field operation, there still was a need to carry out independent back checks of completed field work to ensure its validity and highlight any serious flaws. Such back checking was done by highly experienced staff, well trained in this activity.

Once the data, in the form of completed questionnaires, was received from field, it was passed through the stages of data preparation, and data entry before it was ready for processing.

Data Preparation

Data preparation involved the following two steps:

- i. **Desk Checking:** This is also a quality control measure whereby, all the completed questionnaires were thoroughly scrutinised by experienced desk checkers to make sure that the forms were filled out completely, skipping instructions were followed and there was no obvious mismatch in the information provided in the questionnaire.
- **ii. Coding:** Coding means preparation of data for entry into computer. All the open-ended responses were coded by preparing code frames. Also, the multiple choice and close-ended questions were given pre-defined codes. Due care was exercised at this stage to avoid any coding errors.

Data Entry

Experienced keypunch operators performed data entry after the coding was completed. Some logical validity checks were installed in the data entry software to ensure quality.

Data Processing

Data processing was done by experienced programmers who were given pre-structured output formats for producing statistical tables.

Phase 2: Situation / Performance Analysis

This phase aimed to assess the performance of the industry over time in an attempt at stocktaking and in determining the health and future direction of the industry. It included a comprehensive review of critical data-series and standing of the industry at the moment. Before developing any given AS-IS To Be for international visibility, it was important to conduct some form of situation / performance analysis. This formed an essential part of the future course of action and can be reviewed over time to ensure that it is kept updated. As per our previous experience of similar mandates, we anticipated and took into account the following elements, as it provided a rationale platform for contribution in formulating the future course of action for the IT & ITES industry in Pakistan. This phase was based on the results derived from Phase 1 and other secondary data available in this regard.

Industrial Analysis

As the first step for the Industrial analysis, the Consultant performed the following analytical steps:

- Identifying the chief business and economic characteristics of the industry
- Identifying and assessing driving forces for change
- Evaluating the strength of competitive forces
- Assessing the competitive positions of companies in IT & ITES industry
- Competitive analysis (within and outside the industry)
- Highlighting the key success factors
- Drawing conclusions about overall industry attractiveness

1.3. Report Structure

Findings from the above phases are being reported in the shape of this detailed report, the Contents of which are as follows:-

Section 02: Industry Players' Characteristics

•Geographical Spread, Types, Nature, Years of Operation, Average Revenue, CMMI Certifications, and ISO Certifications of Companies

Section 03: Revenue Breakdown across Markets and Products / Services

• Markets of Operation, Sectors of Operation, Countries of Operation, and Services Provided

Section 04: Human Resource Capacity and Traits

•Total Employees, Permanent Employees, Project Based Employees, Gender Segregation, Functional Spread, Years of Education, Years of Experience, Expertise / Certifications, Educational Background

Section 05: Industry Requirements and Focal Areas

•Required Years of Education, Years of Experience, Expertise / Certifications, Educational Background of Professionals

Section 06: Growth in terms of People, Industry and Revenue

•Growth in Number of Employees, Number of New Companies, Revenue

Section 07: Industry Outlook

•Markets, Sectors and Services of the Future

Section 08: Key Challenges

Underlying Issues

Section 09: Recommendations & Conclusion

•Suggestions from the Industry, Recommendations and Conclusion

Annexures

1.4. Progress Monitoring

The Survey and Data collection was carried out in accordance with the Project Plan. In this relation the activities carried out by the Consultant were monitored by the Client in collaboration and timely communication with the Consultant.

Section 02

Industry Players' Characteristics

Geographical Spread, Types, Nature, Years of Operation, Average Revenue, CMMI Certifications, and ISO Certifications of Companies

2.1.1 Geographical Spread of Companies Sampled

2.1 Geographical Spread



Number of companies sampled per city:

Islamabad	64
Faisalabad	15
Abbottabad	05
Hyderabad	07
Peshawar	32
Multan	14
Sargodha	05
Jhelum	05
Lahore	80
Karachi	73

The data collected is based on 300 companies within our sample. 10 cities were covered under the exercise which included Pakistan's major IT & ITES hubs – Islamabad, Lahore and Karachi.

2.2 Types of Companies



The representative sample suggests that companies within the IT & ITES industry operate under a sole proprietorship, partnership or as a private limited company – with the majority (51%) operating as Private Limited companies while 31% operate as Sole Proprietorships and 11% as Partnerships.

2.3 Nature of Companies

56% of the set ups are local companies, whereas a significant proportion (13%) are foreign subsidiaries operating on behalf of their parent companies abroad. 5% of the companies operate with front offices in other countries. 26% of the respondents did not answer.



The representative sample suggests that about 19% of the companies within the industry are newly incorporated, which have been in operation for less than 3 years. 49% of the companies have been operational for 3-10 years, whereas 31% are those that were incorporated more than 10 years ago. The number of new companies, that have been in operation for less than 3 years give us an insight in the growth within the industry in terms of number of companies.



2.4.1 Companies' Number of Years in



2.5 CMMI Certification Status



2.5.1 CMMI Level Certifications

The representative sample suggests that 4% of the companies within the industry hold CMMI level 5 certifications, while 1% hold CMMI level 4, 3% hold CMMI level 3, 3% hold CMMI level 2, and 8% hold CMMI level 1 certifications. Although there has been an increase in the number of companies that have been able to achieve CMMI certifications over the years, our survey suggests that 81% of the companies still do not hold CMMI certifications of any level.

2.6 ISO Certification Status



Only a mere 12% of the companies hold an ISO certificate

2.6.1.1 Types of ISO Certifications



Out of those that hold an ISO certificate, the majority (54%) hold an ISO 9001 certificate. 5% hold 9002, 5% hold ISO 27001, 3% hold ISMS, and 3% hold QMS certifications.

Pakistan's IT & ITES industry is evolving with the passage of time, catering to international clients around the globe. This industry has the potential to be a global player in terms of IT & ITES enabled services.

International certifications not only add up to the credentials of an existing company, but address key issues and illustrate the fact that the company has what it takes to meet global standards.

A total of 19% among our survey sample of 300 companies were able to confirm they have, indeed, retained one of the five CMMI level certifications, whereas 12% held one of the following certifications:

- ISO 9001
- QMS
- ISO 27001
- ISMS
- ISO 9002

The importance of these surveys cannot be discounted and it is imperative that existing IT & ITES companies, and prospects alike, attain these accreditations to enhance their image among foreign business providers.

Capability Maturity Model Integration (CMMI) is a process improvement training and appraisal program, service administered and marketed by Carnegie Mellon University. Attaining a certification such would, indeed, increase the credibility of IT companies; hence, ranking them on global competitive level.

In an interview to "CODEWEEK", Vice President of Netsol - the leading software house in Pakistan - emphasised on the point that all software companies in Pakistan should achieve at least level 3 CMMI certification to boost customer confidence.

Data in the form of information entrusted to companies in Pakistan by third parties should not be prone to risk; therefore, we feel the need to ensure better and absolute information security. Certification such as ISO 27001, which deals with Information security management should be made mandatory, which increases the confidence of the international market.

The need for an Apex body is dire when it comes to administering any improvements in the IT & ITES industry as a whole, on a uniform basis. The government should take measures to increase awareness of the significance of such certifications

and make a minimum certification level mandatory for all IT & ITES companies in order to strengthen the industry's image worldwide. Government has already subsidised the ISO 9001 and ISO 27001; this needs to be communicated to and emphasised upon all IT & ITES companies.

2.7 IT & ITES Industry's Contributions in overall Economy

The World Economic forum ranked Pakistan at 129th position among 144 countries in the Global Information Technology Report in 2014.

Pakistan was featured in **Global Services Location Index**, at 25th position in 2014 for offshoring by *A.T. Kearney*.

129th among 144 Countries Global Information Technology Report 2014 **25th** Top Offshoring Destination Global Services Location Index – A.T. Kearney

Over 1,500 IT & ITES companies are registered with PSEB, according to PSEB's website. In the course of conducting this survey, we have come to the conclusion that the companies working in Pakistan are far greater in number than those registered with PSEB.

Pakistan's IT & ITES sector is spread mainly in three major cities;

- Karachi
- Lahore
- Islamabad

Average Revenue per Company

PKR 5,000,000 Anne:

Traditionally, Pakistan's economy was mainly driven by agriculture, with the passage of time we have observed a paradigm shift towards ICT which, if channeled properly, will influence every sector of our economy and towards steady economic growth.



For 2013-2014, IT & ITES sector was the Highest Revenue Generating sector in Pakistan, with the licensing of 3G and 4G spectrums which generated Revenue approximating at \$1.118 Billion as per PTA.

Ministry of Information Technology emerged as best performing Ministry in Federal Government according to latest performance audit conducted by Islamabad based think tank "Policy Research Institute of Market Economy" (PRIME) and was awarded a total of 6 points.

Section 03

Revenue Breakdown across Markets, Sectors and Services

Markets of Operation, Sectors of Operation, Countries of Operation, and Services Provided







The IT & ITES industry within Pakistan caters not only to the local market, but also to the international market. In fact, 25% of the companies serve only the international market and 44% serve both, the international and the domestic market. 30% of the companies are strictly serving the domestic market.

The data, thus, suggests that the aggregate percentage of companies serving the domestic market is 74%, whereas the aggregate percentage of companies serving the international market is 69%.

The breakdown of revenue earned from domestic and international market reveals that about 55% of the revenue is earned from the domestic market, whereas 45% is earned from the international market.

Unlike countries such as India, that depend on the international market for the larger part of their revenues, Pakistan's IT & ITES industry appears to be almost equally dependent on the local and international market.

Refer to annexure VII for a detailed breakdown of revenue generated.



Average Revenue per Company PKR 5,000,000 Annex X

3.1 Domestic Market and Revenue Breakdown



Of those serving the domestic market, 3% only serve the public sector, 34% only serve the private sector, whereas 63% serve both the sectors. Therefore, the total percentage of companies serving the public sector is 66%, whereas the total percentage of companies serving the private sector is 97%.

3.1.2 Sectors of Operation for Companies Serving Domestic Market



Those serving the domestic market can further be segregated according to their sectors of operation. 62% of the companies serving the domestic market provide services to the IT sector, 54% to the education sector, 36% to the manufacturing sector, 34% to the service sector, 33% to the banking sector, and 31% to the social sector.

Sectors such as Shipping and Logistics appear to be the least significant sections of the domestic market and, given the nature of these sectors, may become much more significant in the future. Spread of awareness with regard to the IT & ITES industry (discussed further ahead) may be a key to this.



Judging by the percentage of companies' average revenue from different sectors of operation as a proportion of their total revenue, IT Industry appears to be the most significant domestic market. As has been reported in section 3.3, the majority of companies serving the domestic market serve the IT Industry. The companies serving the IT Industry generate, on average, 35% of their total domestic revenues from this section of the market. The companies that serve the Agriculture sector are dependent on it for 24.2% of their total domestic revenues, on average, whereas the companies that serve the Real Estate sector generate 24% of their total domestic revenues from this sector, on average. The domestic sectors least depended upon include Power Generation, FMCG, Transportation, Insurance and textile sectors, all generating 5% of the total domestic revenues, on average, of the companies operating in the respective sectors.

ы		Percentage of Companies in the Sample																		
Percentage of Total Domesti Business	Agriculture Sector	Banking Sector	Manufacturing Sector	Textile Sector	Chemicals and Pharmacuticals Sector	Automotive Sector	Whole Sale and Retail Trade Sector	Insurance Sector	Transportation Sector	IT Sector	SME Sector	Education Sector	Service Sector	Telecommunication Sector	FMCG Sector	Power Generation Sector	Media and Advertising Sector	Social Services Sector	Healthcare Sector	Real Estate Sector
Less than 10%	4%	5%	6%	7%	7%	8%	7%	7%	5%	5%	6%	11%	6%	6%	5%	5%	5%	9%	8%	4%
10% to 20%	0%	2%	2%	0%	1%	0%	1%	0%	0%	4%	2%	2%	2%	2%	0%	0%	2%	2%	1%	0%
20% to 30%	1%	2%	1%	0%	1%	1%	1%	0%	0%	3%	0%	2%	1%	0%	0%	0%	0%	1%	0%	0%
30% to 40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
40% to 50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
50% to 60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60% to 70%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
70% to 80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
80% to 90%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
90% to 100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Only to this country	1%	1%	0%	0%	0%	0%	0%	0%	0%	4%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%



Percentage of Domestic Revenue from Specefic Sector

Using the information above and the average revenue per company, a breakdown of overall domestic revenues is ascertained as illustrated above. The results show that 22% of the domestic revenues are generated from the IT Industry – which is significantly higher than any other individual sector or industry. 8% of the domestic revenues are earned by serving the Education sector, 7% are earned from the Banking sector, whereas 4% are generated from the Agriculture sector and another 4% from the Real Estate sector.

The 300 companies which were selected as a sample for this survey, gave us a unique insight as to which industries in Pakistan majorly require the expertise of these IT companies. From the survey, it was concluded that 54% of the companies serving the domestic market were engaged with the education sector of Pakistan – which generates about 8% of the industry's total domestic revenue.

Education and IT deems a perfect match; providing learning through the internet seemed a far-fetched idea, but with the advancements in internet availability at a reasonable price, many ingenious solutions can be applied to improve the dire situation of this sector.

Some education institutes have taken the first initiatives by incorporating IT into education; the perfect example for this is the "Virtual University" established in 2002, whose sole purpose is to provide education using modern technologies; lectures are provided through television broadcast or over the internet. Another such example is the "Allama Iqbal Open University", which provides opportunities for online and distant learning.

Private education providers feel the need to advertise themselves on the internet to reach this new generation of audience and their need to fill the technology gap in comparison to other education providers around the world. Some institutes have taken an initial step towards this direction introducing online registration. This could further evolve into endless possibilities, i.e. providing lectures online for distant learning, creating data banks for students which consist of video lectures, e-books and other requirements, connecting students to teachers and students to students on institution administered forums. revenues, on average, from this market.

Union.

3.2 International Market and Revenue Breakdown



3.2.1 Countries of Operation for **Companies Serving International Market**



3.2.2 Average Percentage of International Revenue of Companies Generated

Percentage of Total Revenue from Specefic Country

Percentage of Revenue from Other Services

As the survey revealed, 69% of the companies within our sample serve the international market. The most significant international market appears to be USA, generating, on average, 58.3% of the total international revenues of the companies serving USA. UK is the second most important market for the companies engaged internationally. The companies that serve UK generate, on average, 45.3% of their total international revenues from this market, whereas the companies that serve Middle East generate, on average, 42.7% of their total international revenues from serving this market. India has been found to be the least significant market with only a small number of companies serving this market. The companies that do serve India, depend on the market for only 7.5% of their total international revenues, on average.

_	a			P	ercentage o	of Compani	es Serving	the Respec	tive Count	у		
Percentage of Total International Business	Revenue Percentago Band Midpoints	Я	USA	EU	SAARC	China	Japan	Far East	Middle East	India	Australia	Africa
Less than 10%	5%	10%	2%	13%	33%	50%	50%	40%	8%	75%	27%	33%
10% to 20%	15%	10%	7%	13%	33%	0%	50%	40%	17%	25%	18%	33%
20% to 30%	25%	23%	16%	38%	0%	25%	0%	0%	25%	0%	18%	33%
30% to 40%	35%	13%	12%	19%	0%	25%	0%	0%	8%	0%	18%	0%
40% to 50%	45%	10%	9%	6%	0%	0%	0%	20%	13%	0%	9%	0%
50% to 60%	55%	6%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%
60% to 70%	65%	6%	12%	6%	0%	0%	0%	0%	8%	0%	0%	0%
70% to 80%	75%	3%	7%	0%	0%	0%	0%	0%	4%	0%	0%	0%
80% to 90%	85%	3%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%
90% to 100%	95%	3%	2%	0%	0%	0%	0%	0%	4%	0%	0%	0%
Only to this country	100%	13%	23%	6%	33%	0%	0%	0%	13%	0%	9%	0%
Average Perce Companies' Total Revenu	entage of International Ie	45.3%	58.3%	31.6%	40.0%	17.5%	10.0%	17.0%	42.7%	7.5%	28.2%	15.0%



Percentage of International Revenue from Specefic Country

The collection and analysis of information given in illustrations above and companies' average revenues have been used to ascertain the breakdown of overall international revenues in this illustration. Again, USA is the most important international market for the industry; generating 40% of total international revenues of the industry. UK stands as the second largest contributer to the industry's international revenues; generating 24% of total international revenues. Middle East generates 16%, EU generates 9%, whereas Australia generates 5% of the total international revenues of the industry.

3.3 Breakdown across Services



There is a wide range of services provided by the industry, both domestically and internationally. Web designing is the most important service provided domestically, as well as internationally. 49% of the companies providing services domestically provide web designing services to their market, whereas 42% of the companies that provide services internationally provide this service to their respective markets. 46% of the companies catering to the domestic market and 33% of the those that cater to the international market provide customized software development services to their respective markets. Web application development is another major source of business for the industry; 45% of the local service providers and 40% of the international service providers offer this service. Similarly, IT consultancy is yet another dominant source of business for the industry offered by 43% of the companies catering to the domestic market and 25% of those that cater to the international market.

3.3.1 Types of Business Services Provided by Companies Domestically and Internationally

Services / Products	Percentage of Companies Operating Domestically Providing the Service	Percentage of Companies Operating Internationally Providing the Service
Customised Software Development	46%	33%
IT Consultancy	43%	25%
Enterprise Resource Planning	15%	10%
Data Management	25%	18%
Internet Marketing	19%	15%
Web Designing	49%	42%
Web Application Development	45%	40%
Mobile Application Development	21%	26%
Application Re-engineering	9%	9%
Business Process Analysis	11%	10%
Offshore Staffing	4%	7%
E-Commerce	19%	21%
Data Mining	11%	8%
BPO Services	9%	7%
IT Training	21%	10%
SEO	16%	18%
Graphic Designing	28%	23%
System Integration	15%	9%
GIS System Development	4%	3%



3.3.2 Average Percentage of Total Revenue of Companies Generated from Different

Percentage of Total Revenue from Specefic Service

Percentage of Revenue from Other Services

In terms of revenue from a service as a percentage of total revenue, Customised Software Development was found to be the most lucrative. Companies providing this service generate, on average, 29.7% of their total revenue from this service alone. IT Consultancy ranks second by forming, on average, 19.8% of the total revenues of companies engaged in providing this service. On average, ERP forms 16.4%, Data Management forms 14.1%, whereas Internet Marketing forms 13.9% of the total revenues of companies providing the respective services. Refer to annexure IV for a detailed breakdown of revenues earned by companies from these services and the calculation of averages in the illustration above.



3.3.3 Breakdown of Domestic Revenue: Services / Products

Using average revenues and other data collected, a breakdown of the industry's domestic revenue can be ascertained as shown above. Customised Software Development appears to be the largest contributer to the domestic revenue earned by the industry; generating 13.7% of the the overall domestic revenue. IT Consultancy generates 8.5%, Web Designing generates 6.3%, Web Application Development generates 5.3%, whereas Data Management generates 3.5% of the industry's total domestic revenues.



3.3.4 Breakdown of International Revenue: Services / Products

Percentage of International Revenue from Specific Service

Breakdown of international revenue of the industry gives the services, more or less, the same significance as identified through the domestic revenue breakdown. Customised Software Development is responsible for generating 9.8% of the the total international revenues of the industry, followed by Web Designing and IT Consultancy, respectively generating 5.4% and 5% of the total international revenues of the industry.

Section 04

Human Resource Capacity and Traits

Total Employees, Permanent Employees, Project Based Employees, Gender Segregation, Functional Spread, Years of Education, Years of Experience, Expertise / Certifications, Educational Background, and Average Salaries

4.1 Number of Employees

Average Number of Total Employees

45 / Company

4.1.1 Number of Total Employees



Staff strength in terms of total employees (both, permanent and project based) is a key measure for ascertaining a company's size. Most (41%) of the companies in this industry appear to be mid-tier with the number of total employees between 10 and 25. 10% of the companies are small set ups with less than 5 employees, whereas 14% are large organizations with a total staff strength exceeding 50.

Judging only by the number of permanent employees, the percentage of companies with less than 5 employees rises to 15%. Most (32%) of the companies fall within the mid-tier range with the number of permanent employees between 10 and 25. 13% of the companies fall within the 'large' category with permanent employees exceeding 50.

4.1.2 Companies with Permanent Employees





4.1.3 Companies with Project Based **Employees**

> The global IT & ITES industry is highly dependent on a flexible workforce with significant proportions of their total workforce employed on a project basis. However, this does not appear to be the case with the industry in Pakistan. Only 2% of the companies employ a project based workforce exceeding 50. 9% of the companies employ less than 5 project based employees, while 10% employ between 5 and 10 project based employees.

It appears that the industry is mostly fragmented into small companies and set ups. Such fragmentation does not aid specialisation as the number of projects undertaken by each company is far lesser than what may be possible with a fewer large companies. This does not allow the individual companies to gain comprehensive experience and exposure they require to build specialist expertise. There is lack of mergers and acquisitions within the industry. As per Competition Commission of Pakistan's listing of mergers and acquisitions, there are no acquisitions or mergers related to this industry in 2011, 2012, 2013 and 2014. A reason for this could be a lack of possible or identifiable synergies through such actions. Such fragmentation deprives the industry from economies of scale that may be enjoyed in the form of lower marginal costs per additional software or application developed, efficient utilisation of skilled workforce, access to better expertise, easier access to new markets etc.

With regard to permanent employees only, the statistics are more or less similar to those of total employees. It is evident that the industry mostly engages permanent employees rather than project based.

Unlike the global IT & ITES industry, Pakistan's industry is highly dependent on permanent rather than project based employees. A flexible workforce with project based employees allows companies to take advantage of a lower fixed cost base. In addition to this, a flexible workforce allows easier adjustments to changes in level of business within companies, which these companies are currently unable to achieve.

4.2 Gender Segregation

Based on the total number of employees (both, permanent and project based), female inclusion within the industry stands at only 16%.



Segregation of companies by employee gender reveals that women remain a very small proportion of the industry's workforce. 34% of the companies have permanent female workforce of less than 5 and 13% have a permanent female workforce of 5-10. Only 1% of the companies have a permanent female workforce exceeding 50.

In terms of the overall number of permanent employees, as observed within the sample, it is concluded women only make up around 18% of the workforce.



4.2.2 Permanent Employees Segregated by



The situation only seems to worsen while analyzing companies' project based workforce: 89% of the companies do not have any female staff employed on a project basis, while 8% of the companies have a project based female workforce of less than 5.

In terms of overall number of project based employees, it was observed that only about 7% of the workforce is female.

As evident by the results of the survey, the IT & ITES industry significantly lacks female inclusion. Pakistan faces gender disparity in terms of education which causes lack of female inclusion, not only within the IT & ITES industry, but within all the industries and sectors of Pakistan. According to a UNDP report published in 2010, Pakistan is ranked 92nd in 94 countries in terms of Gender-related Development Index (GDI) and Gender Empowerment Measurement (GEM). Female literacy is an issue not only in the rural areas, but also within urban areas of Pakistan. Other than education, Pakistan's cultural norms are a hurdle for women who wish to be more than just house wives. Within the IT & ITES industry, services such as BPO have odd working hours due to time zone differences. Pakistan's cultural norms specifically discourage female inclusion within this industry, due to the nature of work it involves. The industry faces shortage of adequate human resource and enhancing female inclusion may reduce this demand-supply gap.

4.3 Functional Spread

Pakistan's IT & ITES industry employs a vast number of profesionals from various profesional backgrounds. The industry is, however, dominated by IT management professionals (10.5%) and programmers (10.1%).

Technical Writers, Customer Service Professionals, Architects, Helpdesk Professionals and Busniess Analysts hold the smallest share of the workforce.

The data collected has also been provided in a tabular format below.



4.3.1 Functional Spread of Human Resource within the

- Architect
- BPO: Customer Service professionals
- Business Analyst
- Business Development/Client Relationship Manager
- Database Administrator
- Finance
- Graphics Designer
- Helpdesk
- HR
- IT Management (CEO, CIO, CTO, VP)
- Programmer
- Project Manager
- Quality Assurance
- System Administrator
- Team Lead
- Technical Writer

Employee Category	Aggregate Number in Sample	As a Percentage of Aggregate Total
Architect	98	4.6%
BPO: Customer Service professionals	85	4.0%
Business Analyst	103	4.9%
Business Development/Client Relationship Manager	182	8.6%
Database Administrator	125	5.9%
Finance	142	6.7%
Graphics Designer	165	7.8%
Helpdesk	101	4.8%
HR	143	6.8%
IT Management (CEO, CIO, CTO, VP)	223	10.5%
Programmer	214	10.1%
Project Manager	148	7.0%
Quality Assurance	105	5.0%
System Administrator	98	4.6%
Team Lead	125	5.9%
Technical Writer	58	2.7%
TOTAL	2115	100%

The industry is dominated mainly by IT management professionals and programmers as already stated above. The existence of a large number of small companies suggests that individuals within the industry prefer to start their own companies, which results in a large number of professionals acting as IT Management professionals for numerous small start-ups. There are also a large number of programmers within the industry. As analyzed above, a large number of companies provide services such as web application development, software development and mobile application development, which require the expertise of programmers, which justifies the employment of a large number of programmers. Given that the industry believes (30% of the respondents of the sampled companies) that mobile application development will be highest revenue generating service / product in the future, the demand for programmers is likely to be high in the future.

4.4 Years of Education



4.4.1 Professionals' Average Years of Education

Average Current Years of Education

The illustration above shows the average current years of minimum education of different categories of employees within the industry.

The data collected reveals that for most of the professions within the industry, the current common educational level stands at 16 years of education. Architects, Business Analysts, Client Relationship Managers, IT Management, Programmers, Project Managers, Quality Assurance Executives, System Administrators, Teams Leads and Technical Writers within the industry have commonly undergone 16 years of education. Customer Service Professionals, Database Administrators, Graphics Designers and Finance Professionals within the industry have commonly undergone 14 years of education.

The table below shows, in detail, the percentage of responses gathered from companies employing the specific category of professionals, with regard to the minimum years of education of different categories of employees.

		Ре	ercentage	of Resp	onses fro	om Comp	anies Em	ploying t	he Speci	fic Categ	ory of Pro	ofessiona	lls	
Years of Education	Architects	Customer Service Professionals	Business Analysts	Client Relationship Managers	Database Administrators	Finance Professionals	Graphics Designers	IT Management	Programmers	Project Managers	Quality Assurance Professionals	System Administrators	Team Lead	Technical Writers
Less than 10 Years	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
10 Years	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
12 Years	0%	7%	0%	0%	5%	4%	9%	1%	3%	0%	0%	3%	0%	7%
14 Years	31%	50%	35%	35%	45%	52%	57%	15%	26%	22%	33%	33%	22%	29%
16 Years	47%	36%	53%	53%	40%	35%	28%	55%	62 %	65%	58%	57%	62 %	64%
More than 16 Years	22%	7%	12%	12%	10%	8%	4%	27%	9%	13%	9%	7%	16%	0%
Most Common Level of Education	16 Years	14 Years	16 Years	16 Years	14 Years	14 Years	14 Years	16 Years	16 Years	16 Years	16 Years	16 Years	16 Years	16 Years

4.5 Discipline of Study

Respondents were questioned regarding the common educational discipline of the different categories of employees. The data gathered is provided in a tabular form below.

a			Perc	entage o	f Respoi	nses fror	n Compa	anies Em	ploying	the Spec	ific Cate	gory of F	Professio	onals		
Common Education. Discipline	Architects	Customer Service Professionals	Business Analysts	Client Relationship Managers	Database Administrators	Finance Professionals	Graphics Designers	Helpdesk Professionals	HR Professionals	IT Management	Programmers	Project Managers	Quality Assurance Professionals	System Administrators	Team Lead	Technical Writers
Arts	3%	15%	6%	3%	5%	4%	13%	41%	7%	1%	0%	0%	0%	0%	5%	6%
Science	3%	11%	6%	10%	13%	10%	9%	13%	4%	3%	1%	2%	0%	0%	3%	0%
Commerce / Business	2%	26%	30%	39%	8%	60%	13%	19%	29%	7%	4%	6%	3%	7%	8%	19%
Engineering	3%	0%	0%	0%	5%	2%	4%	3%	4%	6%	1%	2%	3%	0%	3%	0%
Management Science	3%	4%	15%	10%	5%	4%	4%	6%	31%	13%	4%	13%	10%	7%	5%	6%
Computer Science	32%	33%	33%	29%	54%	13%	45%	19%	20%	38%	46%	47%	55%	62%	46%	50%
Computer Engineering	6%	7%	6%	3%	10%	4%	5%	0%	2%	14%	15%	9%	13%	14%	11%	13%
Software Engineering	47%	4%	3%	5%	0%	2%	7%	0%	2%	18%	28%	21%	16%	10%	19%	6%
Most Common Discipline of Study	Software Engineering	Computer Science	Computer Science	Commerce / Business	Computer Science	Commerce / Business	Computer Science	Arts	Management Science	Computer Science	Computer Science	Computer Science	Computer Science	Computer Science	Computer Science	Computer Science

4.6 Additional Certifications and Expertise

Respondents were questioned regarding the common additional certifications / expertise of their different categories of employees. The data collected is as follows:

~		Percentage of Responses from Companies Employing the Specific Category of Professionals														
Common Certifiation / Expertise	Architects	Customer Service Professionals	Business Analysts	Client Relationship Managers	Database Administrators	Graphics Designers	Helpdesk Professionals	HR Professionals	IT Management	Programmers	Project Managers	Quality Assurance Professionals	System Administrators	Team Lead	Technical Writers	Finance Professionals
None	24%	50%	52%	54%	38%	57%	75%	59%	31%	20%	25%	45%	27%	23%	57%	65%
Cisco	17%	8%	6%	6%	5%	6%	0%	2%	6%	7%	0%	0%	9%	9%	0%	3%
Microsoft	38%	31%	26%	28%	26%	14%	14%	24%	30%	19%	25%	23%	23%	23%	14%	20%
PHP	7%	4%	10%	4%	10%	12%	7%	2%	8%	15%	16%	5%	9%	14%	14%	5%
.NET	0%	4%	3%	4%	5%	4%	4%	7%	13%	24%	13%	9%	9%	18%	14%	5%
Orcale	10%	4%	3%	4%	13%	2%	0%	2%	5%	9%	6%	5%	9%	0%	0%	0%
PMP	3%	0%	0%	0%	0%	0%	0%	0%	2%	0%	3%	5%	5%	0%	0%	0%
Linux	0%	0%	0%	2%	0%	2%	0%	0%	3%	2%	6%	5%	5%	5%	0%	0%
Mobile App Development	0%	0%	0%	0%	3%	0%	0%	2%	3%	4%	3%	5%	0%	9%	0%	3%
Photoshop	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SCRUM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	5%	0%	0%	0%

4.7 Experience

Respondents were questioned regarding the average years of experience each category of their employees have.



4.7.1 Professionals' Average Years of Experience

Current Average Experience

In terms of experience, Architects and IT Management within the industry stand out with significantly higher number of years of experience in the industry than the rest of the categories. Both, Architects and IT Management, commonly have experience exceeding 8 years. Majority of the remaining categories of employees, including Customer Service Professionals, Business Analysts, Client Relationship Managers, Finance Professionals, Graphics Designers, HR Professionals, Programmers, Project Managers, Quality Assurance Professionals, Team Lead and Technical Writers, all commonly hold experience between 2 and 4 years.

a	Percentage of Responses from Companies Employing the Specific Category of Professionals															
Years of Experience	Architects	Customer Service Professionals	Business Analysts	Client Relationship Managers	Database Administrators	Finance Professionals	Graphics Designers	Helpdesk Professionals	HR Professionals	IT Management	Programmers	Project Managers	Quality Assurance Professionals	System Administrators	Team Lead	Technical Writers
Fresh	6%	14%	6%	8%	5%	9%	11%	15%	4%	3%	4%	2%	6%	4%	3%	7%
Less than 2 Years	6%	24%	18%	16%	20%	19%	18%	29%	21%	6%	13%	4%	12%	15%	11%	29%
2 to 4 Years	12%	28%	32%	28%	24%	30%	33%	29%	30%	24%	32%	33%	33%	33%	35%	36%
4 to 6 Years	26%	10%	21%	26%	24%	26%	24%	15%	21%	15%	24%	28%	24%	33%	24%	21%
6 to 8 Years	18%	14%	12%	10%	17%	13%	11%	9%	11%	14%	14%	11%	12%	4%	11%	7%
More than 8 Years	32%	10%	12%	11%	10%	4%	4%	3%	13%	39%	13%	22%	12%	11%	16%	0%
Most Common Level of Experience	More than 8 Years	2 to 4 Years	2 to 4 Years	2 to 4 Years	2 to 6 Years	2 to 4 Years	2 to 4 Years	Less than 4 Years	2 to 4 Years	More than 8 Years	2 to 4 Years	2 to 4 Years	2 to 4 Years	2 to 6 Years	2 to 4 Years	2 to 4 Years

Annex VI

PKR 35,000

4.8 Salaries

Average Salary within the Industry



The average salary within the IT & ITES industry has been calcuated at PKR 35,000. However, the figure may be misleading as there is significant disparity within the industry with regard to professionals' remuneration. As would be expected, IT Mangement professionals have the highest salaries, commonly falling between PKR 50,000 and PKR 70,000. The salary for Architects, Business Analysts, Database Administrators, Programmers, Project Managers, Quality Assurance Executives and Team Leads are the second highest, commonly falling between PKR 30,000 and PKR 50,000. Salaries were found lowest for Customer Service Professionals, Client Relationship Managers, Graphic Designers, Helpdesk Professionals, HR Professionals and Technical Writers – falling between PKR 15,000 and PKR 30,000.

The details of salary brackets for each category of employees are provided below.

Average Salary Bracket (PKR)		Percentage of Responses from Companies Employing the Specific Category of Professionals														
	Architects	Customer Service Professionals	Business Analysts	Client Relationship Managers	Database Administrators	Graphics Designers	Helpdesk Professionals	HR Professionals	IT Management	Programmers	Project Managers	Quality Assurance Professionals	System Administrators	Team Lead	Technical Writers	
Up to 15,000	4%	11%	7%	8%	8%	14%	38%	5%	3%	8%	2%	11%	8%	9%	13%	
15,000 to 30,000	19%	44%	30%	38%	31%	47%	54%	38%	11%	28%	17%	18%	31%	24%	47%	
30,000 to 50,000	27%	26%	33%	34%	36%	33%	8%	33%	21%	33%	27%	36%	31%	32%	27%	
50,000 to 70,000	23%	15%	20%	15%	19%	4%	0%	15%	28%	20%	24%	25%	23%	15%	7%	
70,000 to 100,000	15%	4%	10%	6%	3%	2%	0%	5%	15%	8%	20%	7%	4%	15%	7%	
100,000 to 150,000	8%	0%	0%	0%	3%	0%	0%	3%	13%	2%	5%	4%	4%	3%	0%	
More than 150,000	4%	0%	0%	0%	0%	0%	0%	0%	8%	2%	5%	0%	0%	3%	0%	

4.8.1 Professionals' Average Salary

Section 05

Industry Requirements and Focal Areas

Growth in Number of Employees, Number of New Companies, Revenue

5.1 Hiring Needs: Certifications and Expertise

Respondents were asked for the common certifications their employees held, and that which they would require for their employees to hold. Analysis of categories of employees by the certifications they hold, in comparison with the requirement, has been presented below. The percentages are based on the companies that employ the specific category of employees. Illustrations below have been summarised for ease of understanding, displaying only the most common individual certifications and no certifications. Detailed tables have also been provided for each category of employees below each illustration. The right most column of the table shows either;

- a further demand for specific professionals, i.e. a higher percentage of companies requiring professionals with specific certifications / expertise than the current percentage of companies that employ the specific professionals, or
- a higher than required availablility of specific professionals, i.e. a lower percentage of companies that require professionals with the specific certifications / expertise than the percentage of companies that currently employ the specific professionals.



■ Microsoft ■ Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	24%	17%	➡
Cisco	17%	21%	
Microsoft	38%	34%	➡
PHP	7%	7%	
.NET	0%	7%	
Oracle	10%	14%	
PMP	3%	0%	➡

The most common certifications among Architects within the industry are Microsoft certifications, supported by responses from almost 38% of the companies that employ this category of employees. Other, less common certifications include Cisco, .NET, PHP, Oracle and PMP, whereas 24% of the companies employing architects do not have additional certificate holding architects.

Comparing this to the future requirements it can be observed that Microsoft certifications are not of as much importance - evident by percentage of companies employing Architects with Microsoft certifications falling to 34.5% and the percentage for other certifications rising from 38% to 48.3%, with the requirement for architects holding Cisco. NET and Oracle certifications rising.



5.1.2 BPO: Customer Service Professionals' Current and Required Certifications



Microsoft Other Certifications ■ No Certifications

50% of the companies employing Customer Service Professionals report that employees within this category do not hold any additional certifications currently. 30.8% of the companies employing Customer Service Professionals commonly have Microsoft certified professionals, while 19.2% of the companies employing BPO professionals report that their their employees commonly hold Cisco, PHP, .NET and Oracle certifications. The future requirements (as can be observed above) suggest that the requirement for Microsoft certified Customer Service Professionals is 37% in the future. There is also a further requirement for professionals with Cisco certifications, Mobile Application Development certifications and PMP certifications.





Other Certifications ■ No Certifications Microsoft
Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	52%	44%	₽
Cisco	6%	9%	
Microsoft	26%	25%	₽
РНР	10%	9%	➡
.NET	3%	3%	
Oracle	3%	6%	
РМР	0%	3%	

51.6% of the companies employing Business Analysts report that their employees in this category do not hold any additional certifications. 25.8% of the companies employing Business Analysts have Microsoft certified professionals while 22.6% have Cisco, PHP, .NET and Oracle certified professionals. However, the future requirement suggests a need for more Cisco, Oracle and PMP certified professionals.



■ Microsoft ■ Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	54%	42%	➡
Cisco	6%	5%	➡
Microsoft	28%	33%	
PHP	4%	7%	
.NET	4%	5%	
Oracle	4%	4%	
Linux	2%	0%	➡
Mobile Application Development	0%	2%	
РМР	0%	2%	

A majority (53.7%) of the companies employing Client Relationship Managers employ professionals that do not hold any additional certifications or expertise. 27.8% of the companies' professionals commonly hold Microsoft certifications while other certifications include Cisco, PHP, Oracle, .NET and Linux certifications. Despite the major certification being Microsoft, there is an additional requirement for Microsoft certified Client Relationship Managers. There is also a requirement for more PHP, .NET, Mobile Application Development and PMP certified managers.



5.1.5 Database Administrators' Current and Required Certifications

■ Microsoft ■ Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	38%	31%	₽
Cisco	5%	8%	
Microsoft	26%	26%	
PHP	10%	13%	
.NET	5%	10%	
Oracle	13%	10%	➡
Mobile Application Development	3%	3%	

25.6% of the companies employing Database Administrators have Microsoft certified professionals. As can be observed, the requirement for Microsoft certified Database Administrators is fully met; however there is a need for professionals holding other certifications (35.9% rising to 43.6%). Other certifications include Cisco, PHP, .NET, Oracle and Mobile Application Development, while a further requirement exists for Cisco, PHP and .NET certified professionals.

5.1.6 Finance Professionals' Current and Required Certifications



■ Microsoft ■ Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	65%	55%	➡
Cisco	3%	5%	
Microsoft	20%	28%	
PHP	5%	5%	
.NET	5%	5%	
Oracle	0%	3%	
Mobile Application Development	3%	0%	➡

A significant majority (65%) of the companies employing Finance professionals report that their respective employees do not hold any additional certifications. The most common certifications among employees within this category are Microsoft certifications; 20%. There is a need for further Finance professionals holding Microsoft certifications, as can be observed by the percentage of companies requiring Microsoft certified professionals being 7.5 percentage points higher than the current figure. There is also a need for professionals with other certification i.e. Cisco and Oracle certified Finance professionals.



Microsoft Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	57%	48%	➡
Cisco	6%	6%	
Microsoft	14%	24%	
PHP	12%	14%	
.NET	4%	4%	
Oracle	2%	2%	
Linux	2%	0%	➡
Mobile Application Development	0%	2%	
Photoshop	2%	0%	

57.1% of the companies employing Graphic Designers report that their employees within this category do not hold any additional certifications. 14.3% of the companies commonly have Microsoft certified Graphic Designers while 28.6% are other certifications including Cisco, PHP, .NET, Oracle, Linux and Photoshop. Future requirements include more Microsoft certified professionals; with the percentage of companies increasing from 14.3% to 24%. The requirement for other certifications in this case has fallen, however, there exists an unmet demand for expertise in PHP and Mobile Application Development.



5.1.8 Helpdesk Professionals Current and Required Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	75%	57%	₽
Cisco	0%	4%	
Microsoft	14%	25%	
РНР	7%	7%	
.NET	4%	4%	
Oracle	0%	4%	

Helpdesk professionals within 75% of the companies employing this category do not hold any additional certifications while professionals within 14.3% of the companies hold Microsoft certifications. Other certifications include Cisco, PHP and .NET. There is a further requirement for Helpdesk professionals holding Microsoft and other certifications; with 25% (currently: 14.3%) of these companies requiring Microsoft certified employees and 17.9% (currently: 10.7%) holding other certifications – the requirement being specifically for Cisco and Oracle certified Helpdesk professionals.

5.1.9 HR Professionals' Current and Required Certifications



Percentage of Companies with this Category of Employees

■ Microsoft ■ Other Certifications ■ No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	59%	51%	➡
Cisco	2%	5%	
Microsoft	24%	22%	➡
PHP	2%	5%	
.NET	7%	10%	
Oracle	2%	5%	
Mobile Application Development	2%	2%	

HR professionals within 58.5% of the companies, that employ this category, do not hold any certifications, whereas Microsoft certifications are the most common within 24.4%. Other certifications and expertise held by HR professionals include Cisco, PHP, .NET, Oracle and Mobile Application Development. Looking at the requirements, the need for Microsoft certified HR professionals lowers in the face of Cisco, PHP, .NET and Oracle certified professionals instead. 2.1% of the companies employing HR professionals with Microsoft certifications would rather opt for professionals with other certifications instead.



5.1.10 IT Mangement's Current and Required Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	31%	26%	
Cisco	6%	13%	
Microsoft	30%	31%	
PHP	8%	8%	
.NET	13%	10%	₽
Oracle	5%	5%	
Linux	3%	2%	₽
Mobile Application Development	3%	3%	
РМР	2%	2%	
SCRUM	0%	2%	

Other Certifications ■ No Certifications Microsoft

The major certifications within this category of employees, again, are Microsoft certifications; 29.7%. IT Management professionals within 39% of companies employing this category hold other certifications and expertise including Cisco, PHP, NET, Oracle, Mobile Application Development, Linux and PMP. The requirement for Microsoft certified IT Management professionals is being met, however, there is a material difference between the current figure for other certifications (39%) and the required figure (43.6%). This can be explained by the unmet requirement for professionals with Cisco and SCRUM certifications.



5.1.11 Programmers' Current and Required Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	20%	17%	➡
Cisco	7%	5%	₽
Microsoft	19%	25%	
PHP	15%	19%	
.NET	24%	20%	➡
Oracle	9%	7%	➡
Linux	2%	2%	
Mobile Application Development	4%	3%	➡
SAP	0%	2%	

Currently, Programmers within 20.4% of the companies employing this category of professionals hold .NET certifications, whereas Programmers within 55.5% of the companies hold other certifications and expertise including Cisco, Microsoft, PHP, Oracle, Mobile Application Development and Linux. However, the requirement suggests a complete shift, giving Microsoft certifications the highest significance. The percentage of companies employing Programmers that require .NET certified professionals is 20.3% (current figure: 24.1) while 25.1% of the companies require Microsoft certified Programmers (current figure: 18.5%). There is also an increased figure for other certifications of 62.8% (current figure: 55.5%) and this can be explained by the requirement for more Programmers who are certified in PHP and SAP.



Microsoft Other Certifications No Certifications

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	25%	18%	
Cisco	0%	5%	
Microsoft	25%	29%	
PHP	16%	13%	➡
.NET	13%	13%	
Oracle	6%	8%	
Linux	6%	0%	➡
Mobile Application Development	3%	5%	
РМР	3%	5%	
SCRUM	3%	3%	

Microsoft certifications are the most common with Project Mangers within the industry. Project Mangers within 25% of the companies employing this category of professionals hold Microsoft certifications while 50% of the companies' respective Project Mangers commonly hold PHP, .NET, Oracle, Mobile Application Development, Linux, PMP and SCRUM certifications and expertise. There is, however, a need for more Microsoft certified Project Managers as well as Mangers holding Cisco, .NET, Oracle, PMP and Mobile Application Development certifications and expertise.



5.1.13 Quality Assurance Professionals' Current and Required Certifications



Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	45%	32%	➡
Cisco	0%	5%	
Microsoft	23%	23%	
PHP	5%	14%	
.NET	9%	9%	
Oracle	5%	9%	
Linux	5%	0%	➡
Mobile Application Development	5%	5%	
PMP	5%	5%	

45.5% of the companies employing Quality Assurance Professionals report that their professionals from this category do not hold any certifications. The majorly common certifications in this field are Microsoft certifications; common within the professionals of 22.7% of these companies. Other certifications and expertise, held by 31.8% of the companies' Quality Assurance Professionals, are PHP, .NET, Oracle, Mobile Application Development, Linux and PMP. The requirement for professionals with Microsoft certifications appears to be fully met, however there is a need for other certifications required by 45.5% of these companies. These certifications include Cisco, PHP, PMP and Oracle.



5.1.14 System Administrators' Current and Required Certifications



Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	27%	30%	
Cisco	9%	10%	
Microsoft	23%	30%	
РНР	9%	5%	₽
.NET	9%	5%	₽
Oracle	9%	15%	
Linux	0%	5%	
Mobile Application Development	5%	5%	
РМР	5%	0%	₽
SCRUM	5%	0%	₽

22.7% of the companies employing this category of employees commonly have Microsoft certified System Administrators. 50% of the companies' System Administrators hold Cisco, PHP, .NET, Oracle, PMP and SCRUM certifications. 30% of the companies employing these professionals require Microsoft certified System Administrators (current figure: 22.7%) suggesting a shortfall in Microsoft certified professionals in this category. There is also a requirement for more System Administrators with Cisco, Oracle and Linux certifications. It is, however, interesting to note that the required figure for System Administrators with no certifications (30%) employed by the companies is higher than the current figure (27.3%). This may suggest a lack of importance for such certifications within this category of professionals.



■ No Certifications

Other Certifications

Microsoft

Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	23%	26%	
Cisco	9%	4%	➡
Microsoft	23%	30%	
PHP	14%	11%	₽
.NET	18%	11%	➡
Oracle	0%	4%	
Linux	5%	4%	➡
Mobile Application Development	9%	7%	➡
PMP	0%	4%	

22.7% of the companies employing Team Leads report that these professionals commonly hold Microsoft certifications, whereas 54.6% report that the professionals commonly hold certifications and expertise in Cisco, PHP, .NET, Mobile Application Development and Linux. There appears to be a slight unmet requirement for Microsoft certified Team Leads with 25.6% of the companies requiring their Team Leads to hold Microsoft (current figure: 22.7%), as well as Oracle and PMP certifications.



5.1.16 Technical Writers' Current and Required Certifications



Common Certifications / Expertise	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
None	57%	36%	➡
Cisco	0%	9%	
Microsoft	14%	27%	
PHP	14%	9%	➡
.NET	14%	18%	

57.1% of the companies employing Technical Writers report that the professionals in this category under them do not hold any certifications. Once again, the most common certifications, as reported by 14.3% of these companies, are Microsoft certifications, whereas 28.6% of these companies report certifications in PHP and .NET to be more common among their Technical Writers. Technicals Writers holding certifications in Microsoft are required by 27.3% of the companies employing this category of employees but are available with far lesser number (as can be observed above). There is also a requirement for Technical Writers holding certifications in Cisco and .NET.

5.2 Hiring Needs: Discipline of Study

Respondents were questioned regarding the common educational backgrounds of their different categories of employees. Respondents were then guestioned regarding the educational background they would require their employees of different catagories to hold in the future. A comparison of the current and required educational backgrounds of professionals, within the industry, from different catagories has been provided below. Illustrations below have been summarised for ease of understanding, displaying only the most common and significant background educational disciplines. The percentages are based on companies within the sample that employ the respective category of professionals. Detailed tables have also been provided for each category of employees below each illustration. The right most column of the table shows either:

a further demand for specific prefessionals, i.e. a higher percentage of companies requiring professionals from specific educational discipline than the current percentage of companies that employ the specific professionals, or

a higher than required availability of specific professionals, i.e. a lower percentage of companies that require professionals from the specific educational discipline than the percentage of companies that currently employ the specific professionals.



5.2.1 Architects' Current and Required Educational Backgrounds

Computer Science	Other	Educational	Disciplines
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Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	3%	3%	
Science	3%	3%	
Commerce/Business	3%	3%	
Engineering	3%	3%	
Management Science	3%	3%	
Computer Science	32%	32%	
Computer Engineering	6%	6%	
Software Engineering	47%	47%	

Architects within the industry appear to be fully meeting the industry requirements with regard to their educational backgrounds.



5.2.2 Customer Service Professionals' Current and Required Educational **Backgrounds**



Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	15%	7%	₽
Science	11%	14%	
Commerce/Business	26%	18%	₽
Engineering	0%	4%	
Management Science	4%	11%	
Computer Science	33%	36%	
Computer Engineering	7%	11%	
Software Engineering	4%	0%	₽

The most common educational background for Customer Service Professionals is Computer Science, with 33.3% of the companies employing this category of employees, within the sample, reporting their professionals as holding an education in Computer Science. There is also a significant proportion of companies (25.9%) that reported their professionals to be from Commerce / Business educational disciplines. The requirement, however, is relatively different. 35.7% of these companies require their Customer Service Professionals to be from a Computer Science background, whereas there is an excess availability of individuals from Commerce / Business background filling these roles (17.9% required figure compared to 25.9% current figure). There is also a requirement for professionals from Science, Engineering, Management Science and Computer Engineering educational disciplines.



Other Educational Disciplines

Commerce / Business

Computer Science

5.2.3 Business Analysts' Current and Required Educational Backgrounds

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	6%	0%	₽
Science	6%	9%	
Commerce/Business	30%	21%	₽
Engineering	0%	3%	
Management Science	15%	15%	
Computer Science	33%	45%	
Computer Engineering	6%	3%	₽
Software Engineering	3%	3%	₽

Business Analysts within the industry are mainly from Computer Science educational background – reported by 33.3% of the companies employing this category. However, there is still a further requirement for such professionals with 45.5% of these companies requiring their Business Analysts to hold a background Education in Computer Science. Another, almost equally important discipline is the Commerce / Business educational discipline (current figure: 30.3%). The data suggests that there is a decline in the need for Business Analysts from a Commerce / Business educational background (required figure: 21.2%), which appears to have shifted in favour of professionals with education in Computer Science, Science and Engineering.



5.2.4 Client Relationship Managers' Current and Required Educational Backgrounds

Commerce / Business Other Educational Disciplines

ciplines Computer Science

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	3%	3%	
Science	10%	12%	
Commerce/Business	39%	32%	➡
Engineering	0%	2%	
Management Science	10%	8%	➡
Computer Science	29%	34%	
Computer Engineering	3%	5%	
Software Engineering	5%	3%	₽

The most common educational background for Client Relationship Managers within the industry is Commerce / Business – as reported by 39% of the companies employing these professionals. The second most common educational background for these professionals is Computer Science – reported by 28.8% of these companies. Other important disciplines include Science and Management Science. The requirement, however, is shifting. 32.2% of the companies employing this category of professionals require Relationship Managers holding a background education in Commerce / Business. The need seems to have moved mainly in favour of professionals from Computer Science. There also exists a reqiement for professionals from Science, Engineering and Computer Engineering disciplines of education. It is important to remember, however, that professionals with a background education in Commerce / Business disciplines still play an important role within the industry.



5.2.5 Database Administrators' Current and Required Educational Backgrounds

Computer Science

Other Educational Disciplines
Computer Engineering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	5%	3%	➡
Science	13%	8%	➡
Commerce/Business	8%	13%	
Engineering	5%	3%	➡
Management Science	5%	8%	
Computer Science	54%	48%	➡
Computer Engineering	10%	15%	
Software Engineering	0%	5%	

The majority (53.8%) of the companies within the sample that employ Database Administrators, report their professionals' common educational discipline to be Computer Science. Other significant educational disciplines, within the said role, include Science, Commerce / Business and Computer Engineering. With regard to the requirement of the industry, only 47.5% of the companies employing Database Administrators require professionals in this capacity to be from a Computer Science educational background (compared to the current figure of 53.8%). There exists a need for professionals in the said capacity to be from Computer Engineering educational discipline (required figure: 15%) which only 10.3% of these companies are reported to currently employ. Additionally, the data shows a requirement for Database Administrators from Commerce / Business, Management Science and Software Engineering disciplines of Education.



5.2.6 Finance Professionals' Current and Required Educational Backgrounds

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	4%	2%	₽
Science	10%	9%	₽
Commerce/Business	60%	57%	₽
Engineering	2%	2%	
Management Science	4%	11%	
Computer Science	13%	17%	
Computer Engineering	4%	2%	➡
Software Engineering	2%	0%	➡

As would be expected, 60.4% of the companies employing Finance Professionals, report these professionals to be from the Commerce / Business educational discipline. 12.5% of the companies reported that these roles were filled by professionals from Computer Science discipline. With regard to the requirements, only 56.5% of the companies employing Finance Professionals require professionals in the said role to have background education in Commerce / Business (current figure: 60.4%), whereas surprisingly, there is a need for professionals in this capacity to have backround education in Computer Science – reported by 17.4% of the employers of this category. The need for professionals in this capacity to be from Management Science educational discipline was also observed; required by 10.9% of the employers of Finance Professionals (current figure: 4.2%).

5.2.7 Graphic Designers' Current and Required Educational Backgrounds



Computer Science Other Educational Disciplines Arts

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	13%	6%	➡
Science	9%	11%	
Commerce/Business	13%	11%	➡
Engineering	4%	6%	
Management Science	4%	6%	
Computer Science	45%	47%	
Computer Engineering	5%	6%	
Software Engineering	7%	8%	

45.5% of the companies employing Graphic Designers within our sample report that the common educational background for these professionals is Computer Science. The responsibility is also taken on commonly by indivuduals with a background education in Commerce / Business within 12.7% of the companies employing this category of employees and by individuals with a background in Arts within another 12.7% of these companies – the required figures show that the demand for such professionals is lower than that currently employed. The requirement for educational backgrounds with regard to Graphic Designers within the industry is in favour of professionals with background education in Computer Science Science, Engineering, Management Science, Computer Engineering and Software Engineering.

Arts



5.2.8 Helpdesk Professionals' Current and Required Educational Backgrounds

Other Educational Disciplines

Commerce / Business

Computer Science

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	41%	35%	
Science	13%	6%	➡
Commerce/Business	19%	26%	
Engineering	3%	0%	➡
Management Science	6%	10%	
Computer Science	19%	19%	
Computer Engineering	0%	3%	

The most common educational background within the industry for Helpdesk Professionals was found to be Arts; reported by 40.6% of the companies employing this category of professionals. Other significant educational backgrounds common within this category of employees were Commerce / Business (18.8%) and Computer Science (18.8%). The requirements of the industry show that only 35.5% of these companies would require professionals with a background in Arts (current figure: 40.6%). The requirement appears to be lower than the currently employed professionals within this category with a background in Science and Engineering moving in favour of professionals belonging to Commerce / Business, Management Science and Computer Engineering educational disciplines.

Required 34.1% 20.49 Current 31.1% 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% Percentage of Companies with this Category of Employees Management Sciences Other Educational Disciplines Commerce / Business Computer Science

5.2.9 HR Professionals' Current and Required Educational Backgrounds

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	7%	5%	₽
Science	4%	7%	
Commerce/Business	29%	20%	₽
Engineering	4%	2%	₽
Management Science	31%	34%	
Computer Science	20%	25%	
Computer Engineering	2%	2%	
Software Engineering	2%	5%	

The representative sample suggests that HR professionals within the industry commonly belong to the Management Science discipline – reported by 31.1% of the companies employing these professionals. Other common disciplines include Commerce / Business and Computer Science. With regard to requirements of the industry, 34.1% of the companies (current figure: 31.1%) employing HR Professionals require these professionals to hold background education in Management Science, whereas there aslo exists a requirement for HR Professionals from the Computer Science discipline – 25% of these companies reporting a need for such professionals compared to 20% of the companies that currently employ such professionals. The requirement for these professionals from the Commerce / Business educational discipline is far lesser than that currently employed (currently employed by 28.9% of the companies compared to 20.5% that require such professionals.). The industry also appears to be in need of professionals from Software Engineering and Science educational disciplines.



Computer Science Other Educational Disciplines

Software Engineering

Computer Enginering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	1%	1%	
Science	3%	3%	
Commerce/Business	7%	7%	
Engineering	6%	4%	➡
Management Science	13%	12%	➡
Computer Science	38%	35%	➡
Computer Engineering	14%	13%	➡
Software Engineering	18%	24%	

IT Management within this industry mainly belongs to the Computer Science discipline – reported by 38% of the companies. A significant number of companies with this category of professionals also report that their professionals from this category commonly belong to Software Engineering (18.3%) and Computer Engineering (14.1%) disciplines. With regard to industry requirements, 35.3% of the companies (current figure: 38%) with this category of employees require these professionals to hold a background education in Computer Science. The requirement is also slightly lower than the current employment of these professionals with a background education in Engineering, Management Science and Computer Engineering. The requirement within this category of employees suggests a need for more IT Management professionals from the Software Engineering discipline.



5.2.11 Programmers' Current and Required Educational Backgrounds



ciplines Software Engineering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	0%	2%	
Science	1%	2%	
Commerce/Business	4%	3%	➡
Engineering	1%	3%	
Management Science	4%	5%	
Computer Science	46%	48%	
Computer Engineering	15%	9%	➡
Software Engineering	28%	29%	

A significant proportion of Programmers wihin the industry commonly belong to the Computer Science discipline – reported by 45.6% of the companies employing Programmers. Compared to this, 48.5% of the companies employing Programmers require these professionals to hold a background education in Computer Science.There are also exists an unmet demand for Programmers belonging to the Software Engineering, Science and Engineering educational disciplines.

5.2.12 Project Managers' Current and Required Educational Backgrounds Required 47.8% Current 46.8% 1 9 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100% Percentage of Companies with this Category of Employees Other Educational Disciplines Software Engineering Computer Science

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Science	2%	0%	➡
Commerce/Business	6%	4%	➡
Engineering	2%	2%	
Management Science	13%	11%	➡
Computer Science	47%	48%	
Computer Engineering	9%	13%	
Software Engineering	21%	22%	

The educational backgrounds of Project Managers within the industry have commonly been found to be Computer Science, as reported by 46.8% of the companies with this category of employees. The second most common educational background for Project Managers was found to be Software Engineering; 21.3%. Commerce / Business, Management Science and Computer Engineering were also some of the significant educational disciplines to which the Project Managers within the industry belonged to. Looking at the requirements for the future, there appears to be further demand for Project Managers with background education in Computer Science, Computer Engineering and Software Engineering.





Percentage of Companies with this Category of Employees

Computer Science Other Educational Disciplines Software Engineering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Commerce/Business	3%	0%	➡
Engineering	3%	3%	
Management Science	10%	7%	➡
Computer Science	55%	60%	
Computer Engineering	13%	13%	
Software Engineering	16%	17%	

Quality Assurance Professionals within the industry most commonly belong to the Computer Science discipline, as reported by 54.8% of the companies employing this category of professionals. Other common educational disciplines for these professionals are Software Engineering (16.1%) and Computer Engineering (12.9%). The future requirements suggest a need for more Quality Assurance Proffesionals that belong to Computer Science educational discipline (needed by 60% companies employing these professionals compared to 54.8% that currently employ such professionals), while there exists greater than required availability of professionals that belong to Commerce / Business and Management Science educational discipline.



5.2.14 System Administrators' Current and Required Educational Backgrounds

Computer Science Other Educational Disciplines

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Science	0%	4%	
Commerce/Business	7%	4%	➡
Engineering	0%	4%	
Management Science	7%	7%	
Computer Science	62%	59%	➡
Computer Engineering	14%	15%	
Software Engineering	10%	7%	➡

The majority (62.1%) of the companies that employ System Administrators report that these professionals commonly belong to the Computer Science discipline. There exists a slight requirement for professionals from Science, Engineering and Computer Engineering disciplines of education.





Computer Science

Other Educational Disciplines

Software Engineering

Computer Engineering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	5%	3%	➡
Science	3%	3%	
Commerce/Business	8%	6%	➡
Engineering	3%	6%	
Management Science	5%	8%	
Computer Science	46%	39%	➡
Computer Engineering	11%	17%	
Software Engineering	19%	19%	

45.9% of the companies employing professionals within the capacity of Team Leads report that these professionals commonly belong to the Computer Science educational discipline, 18.9% report that these professionals commonly belong to Software Engineering discipline, whereas 10.8% report that these professionals commonly belong to the Computer Engineering discipline. Responses received with regard to the future requirements suggest that only 38.9% of the companies employing this category of employees require professionals belonging to the Computer Science educational discipline (compared to the current figure of 45.9%). As can be seen in the illustration and table above, there is a requirement for more Team Leads with an education in Engineering, Computer Engineering and Management Science educational disciplines.



Computer Science

Other Educational Disciplines

s Commerce / Business

Computer Engineering

Common Background Educational Discipline	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Arts	6%	6%	
Science	0%	6%	
Commerce/Business	19%	11%	➡
Engineering	0%	6%	
Management Science	6%	6%	
Computer Science	50%	56%	
Computer Engineering	13%	6%	➡
Software Engineering	6%	6%	

Half the companies within the industry employing Technical Writers report that the common educational background for these professionals is Computer Science. Other common disciplines of significance for these professionals are Commerce / Business and Computer Engineering. With regard to the requirements of the industry, it is evident that more companies require Technical Writers that belong to the Computer Science educational discipline – with 55.6% of the companies employing this category of employees displaying the need. There is also a need for more Technical Writers that belong to Science and Engineering displines of education.

5.3 Hiring Needs: Years of Education



5.3.1 Professionals' Average Years of Education

The illustration above shows the average current and required years on minimum education of different categories of employees within the industry.

The data collected reveals that for most of the professions within the industry, the current common educational level stands at 16 years of education. Architects, Business Analysts, Client Relationship Managers, IT Management, Programmers, Project Managers, Quality Assurance Executives, System Administrators, Teams Leads and Technical Writers within the industry have commonly undergone 16 years of education and are, on average, meeting the requirements of the industry – which requires these professionals to have 16 years of education. Customer Service Professionals, Database Administrators and Finance Professionals within the industry, however, have commonly undergone 14 years of education and are unable to meet the requirement of the industry of 16 years of education. Graphic Designers within the industry commonly hold 14 years of education which is as required by the industry.

Although there appears to be no major unmet requirements in terms of education, the detailed look provided ahead mainly shows a need for a slightly more educated resource.

The detailed responses received from companies received are provided below. The right most column indicates either;

A further requirement for professionals with a certain level of education.

A more than required amount professionals with a certain level of education.

Architects			
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	0%	0%	
14 Years	31%	15%	➡
16 Years	47%	55%	
More than 16 Years	22%	30%	

BPO: Customer Service Professionals

Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	7%	4%	₽
14 Years	50%	39%	₽
16 Years	36%	46%	
More than 16 Years	7%	11%	

Business Analysts Percentage of Responses by Companies Employing the Specific Category of Employees: Current Percentage of Responses by Companies Employing the Specific Category of Employees: Required Minimum Years of Education 0% Less than 10 Years 0% 0% 0% 10 Years ╈ 0% 3% 12 Years 14 Years 35% 21% ➡ 16 Years 53% 67% 1 L More than 16 Years 12% 9%

Client Relationship Managers

Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	0%	2%	
14 Years	35%	40%	
16 Years	53%	47%	₽
More than 16 Years	12%	12%	

	Database Administrators		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	5%	3%	
14 Years	45%	30%	
16 Years	40%	55%	
More than 16 Years	10%	13%	
	Finance Professionals		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	4%	2%	➡
14 Years	52%	43%	
16 Years	35%	46%	
More than 16 Years	8%	9%	
	Graphics Designers		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	2%	0%	➡
12 Years	9%	7%	➡
14 Years	57%	44%	➡
16 Years	28%	39%	
More than 16 Years	4%	9%	
	IT Management		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	1%	1%	
10 Years	0%	0%	
12 Years	1%	1%	
14 Years	15%	13%	➡
14 Years 16 Years	15% 55%	13% 51%	↓

Programmers				
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required		
Less than 10 Years	0%	1%		
10 Years	0%	0%		
12 Years	3%	1%	₽	
14 Years	26%	21%	➡	
16 Years	62%	57%	₽	
More than 16 Years	9%	19%		
	Project Managers			
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required		
Less than 10 Years	0%	0%		
10 Years	0%	0%		
12 Years	0%	0%		
14 Years	22%	17%	➡	
16 Years	65%	57%	➡	
More than 16 Years	13%	26%		
	Quality Assurance Professionals			
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required		
Less than 10 Years	0%	0%		
10 Years	0%	0%		
12 Years	0%	3%		
14 Years	33%	26%	➡	
16 Years	58%	58%		
More than 16 Years	9%	13%		
	System Administrators			
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required		
Less than 10 Years	0%	0%		
10 Years	0%	0%		
12 Years	3%	0%	➡	
14 Years	33%	32%	➡	
16 Years	57%	57%		
More than 16 Veera	70/	11%		

	Team Lead		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	3%	
12 Years	0%	0%	
14 Years	22%	18%	➡
16 Years	62%	53%	₽
More than 16 Years	16%	26%	
	Technical Writers		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 10 Years	0%	0%	
10 Years	0%	0%	
12 Years	7%	0%	₽
14 Years	29%	33%	
16 Years	64%	61%	➡
More than 16 Years	0%	6%	

5.4 Hiring Needs: Years of Experience



5.4.1 Professionals' Average Years of Experience

Overall, this survey suggests that experiece of professionals is largely as required. The only exception being of Helpdesk employees, whose current average years of experience computes to 2 years as compared to the required 3 years of experience. Refer to annexure VII for details.

Although the average figures do not show any major unmet requirements, a closer look is provided below.

The detailed responses received from companies received are provided below. The right most column indicates either;

╋ A further requirement for professionals with a certain level of experience.

A more than required amount professionals with a certain level of experience.

	Architects		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	6%	3%	₽
Less than 2 Years	6%	6%	
2 to 4 Years	12%	13%	
4 to 6 Years	26%	19%	₽
6 to 8 Years	18%	22%	
More than 8 years	32%	38%	
	BPO: Customer Service Professionals		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	14%	3%	₽
Less than 2 Years	24%	21%	₽
2 to 4 Years	28%	28%	
4 to 6 Years	10%	21%	
6 to 8 Years	14%	17%	
More than 8 years	10%	10%	
	Business Analysts		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	6%	3%	₽
Less than 2 Years	18%	9%	₽
2 to 4 Years	32%	35%	
4 to 6 Years	21%	24%	
6 to 8 Years	12%	21%	
More than 8 years	12%	9%	➡
	Client Relationship Managers		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	8%	2%	₽
Less than 2 Years	16%	15%	₽
2 to 4 Years	28%	35%	
4 to 6 Years	26%	28%	
6 to 8 Years	10%	12%	
More than 8 years	11%	8%	➡

	Database Administrators		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	5%	3%	➡
Less than 2 Years	20%	15%	
2 to 4 Years	24%	33%	
4 to 6 Years	24%	30%	
6 to 8 Years	17%	13%	➡
More than 8 years	10%	8%	➡
	Finance Professionals		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	9%	4%	➡
Less than 2 Years	19%	15%	➡
2 to 4 Years	30%	33%	
4 to 6 Years	26%	26%	
6 to 8 Years	13%	17%	
More than 8 years	4%	4%	
	Graphics Designers		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	11%	4%	➡
Less than 2 Years	18%	15%	
2 to 4 Years	33%	39%	
4 to 6 Years	24%	22%	➡
6 to 8 Years	11%	13%	
More than 8 years	4%	7%	
	IT Management		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	3%	3%	
Less than 2 Years	6%	6%	
2 to 4 Years	24%	21%	➡
4 to 6 Years	15%	19%	
6 to 8 Years	14%	13%	
More than 8 years	39%	39%	

Programmers			
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	4%	8%	
Less than 2 Years	13%	32%	
2 to 4 Years	32%	26%	➡
4 to 6 Years	24%	17%	➡
6 to 8 Years	14%	17%	
More than 8 years	13%	0%	➡
	Project Managers		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	2%	2%	
Less than 2 Years	4%	6%	
2 to 4 Years	33%	28%	➡
4 to 6 Years	28%	26%	➡
6 to 8 Years	11%	19%	
More than 8 years	22%	19%	➡
	Quality Assurance Professionals		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	6%	3%	➡
Less than 2 Years	12%	17%	
Less than 2 Years 2 to 4 Years	12% 33%	17% 33%	1
Less than 2 Years 2 to 4 Years 4 to 6 Years	12% 33% 24%	17% 33% 23%	1
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years	12% 33% 24% 12%	17% 33% 23% 10%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years	12% 33% 24% 12% 12%	17% 33% 23% 10% 13%	 ↑ ↓ ↓ ↓ ↑
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years	12% 33% 24% 12% 12% System Administrators	17% 33% 23% 10% 13%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education	12% 33% 24% 12% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education Fresh	12% 33% 24% 12% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current 4%	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required 4%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education Fresh Less than 2 Years	12% 33% 24% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current 4% 15%	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required 4% 11%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years	12% 33% 24% 12% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current 4% 15% 33%	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required 4% 11% 39%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years 4 to 6 Years	12% 33% 24% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current 4% 15% 33% 33%	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required 4% 11% 39% 21%	
Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years More than 8 years Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years	12% 33% 24% 12% System Administrators Percentage of Responses by Companies Employing the Specific Category of Employees: Current 4% 15% 33% 33% 4%	17% 33% 23% 10% 13% Percentage of Responses by Companies Employing the Specific Category of Employees: Required 4% 11% 39% 21% 7%	

	Team Lead		
Minimum Years of Education	Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Fresh	3%	3%	
Less than 2 Years	11%	3%	➡
2 to 4 Years	35%	34%	➡
4 to 6 Years	24%	29%	
6 to 8 Years	11%	14%	
More than 8 years	16%	17%	
	Technical Writers		
Minimum Years of Education	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current	Percentage of Responses by Companies Employing the Specific Category of Employees: Required	
Minimum Years of Education	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current 7%	Percentage of Responses by Companies Employing the Specific Category of Employees: Required 6%	•
Minimum Years of Education Fresh Less than 2 Years	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current 7% 29%	Percentage of Responses by Companies Employing the Specific Category of Employees: Required 6% 12%	•
Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current 7% 29% 36%	Percentage of Responses by Companies Employing the Specific Category of Employees: Required 6% 12% 47%	↓ ↓ ↓
Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years 4 to 6 Years	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current 7% 29% 36% 21%	Percentage of Responses by Companies Employing the Specific Category of Employees: Required 6% 12% 47% 18%	↓ ↓ ↑ ↓
Minimum Years of Education Fresh Less than 2 Years 2 to 4 Years 4 to 6 Years 6 to 8 Years	Technical Writers Percentage of Responses by Companies Employing the Specific Category of Employees: Current 7% 29% 36% 21% 7% 7%	Percentage of Responses by Companies Employing the Specific Category of Employees: Required 6% 12% 47% 18% 18% 12%	

Section 06

Growth in Terms of People, Players and Revenues

Growth in Number of Employees, Number of New Companies, Revenue

6.1 Growth in Number of Employees



Growth in the Number of Employees

Over Last 3 Years

Growth in the number of total employees over the 3 years is 20.4%. The aggregate number of total employees currently within the sample companies stands at 13,191, while the aggregate figure 3 years ago comes down to 10,954.

20%



6.1.2 Companies with Growth in Number of Employees over Past 3 Years

Despite the countless chellenges faced by the industry, growth in terms of employees has been impressive over the past 3 years. 44% of the companies have seen a growth of over 50% in the past three years in the number of total employees (both, permenant and project based) whereas 20% of the companies have seen a growth of 10% to 50%. It is evident that the IT & ITES industry is on its way to gain the rightful attention with an increasing number of people opting to enter this industry.

23% Annex IX

6.2 Growth in Number of Companies







The data collected suggests that, currently, 38% of the companies within the industry generate between PKR 1 million and PKR 5 million in reveue annually. 16% of the companies generate PKR I million and lesser; 18% generate between PKR 5 million and PKR 10 million; 17% generate between PKR 10 million and PKR 20 million; 6% generate between PKR 20 million and PKR 50 million; while only 5% generate revenue of PKR 50 million and more.

78% of the companies saw their revenues grow over the past 3 years, while 14% saw a decline. A mere 1% suggested that their business had remained stable over the period.

The remaining section ahead takes a closer look into the magnitude of growth and decline these businesses have seen.

6.3.2 Percentage of Businesses that Grew / Declined





6.3.3 Revenue Growth

As evident by the illustration above, there has been a significant growth within the industry overall. 36% of the sampled companies fell within the lowest revenue band 3 years ago, of which only 16% remain within this revenue band. These companies appear to have moved into higher revenue bands, generating increased revenues between Rs 1 million and Rs 5 million, between 5 million and 10 million, between 10 million and 20 million, and between 20 million and 50 million. The increase can most prominently be witnessed within the 3rd highest revenue band, i.e. 10 Rs million to Rs 20 million.



6.3.4 Revenue Growth: Businesses that have Grown in Revenue

Out of the companies that have grown in the past 3 years in terms of revenue, a significant proportion have crossed the PKR 1 million threshold and moved into higher revenue bands. 34% of the companies that have grown in the past were generating revenues of less than PKR 1 million 3 years ago, whereas only 12% of the companies that have grown remain within this threshold now.



6.3.5 Revenue Decline: Businesses that have Declined in Revenue

Businesses that have declined in terms of revenue appear to have moved from higher revenue bands largely to less than PKR 1 million revenue band. 12% of the companies that have seen a decline were generating revenues of less than PKR 1 million 3 years ago. This percentage has now increased to 26%. 12% of these companies were generating revenues of more than PKR 50 million; the percentage has now fallen to only 2%.

Average Estimated Revenue Growth within the Industry Over Last 3 Years

29% Annex VIII



6.3.6 Percentage Revenue Growth / Decline in Businesses

A significant portion (23%) of the companies within our sample report their revenues increasing by 20% to 30% over the past 3 years. 14% of the companies reported a growth of 10% to 20%, 10% reported a growth of 30% to 40%, whereas 9% reported a growth of over 100% over the last 3 years. As can be seen above, the percentage of companies that have seen a decline in revenues and the percentage by which they have declined is far lesser than the percentage of companies that have grown and the percentage by which they have grown. This has resulted in an overall growth within the industry in terms of revenue.



6.3.7 Percentage Revenue Growth in Businesses that have Grown

12% of the businesses that have grown over the past 3 years have grown more than a 100% over the period. However, a larger proportion of these companies have grown far lesser than this; 6% of the companies that grew achieved growth of less than 10%, 18% achieved growth of 10% to 20%, 29% achieved growth of 20% to 30%, 13% achieved growth of 30% to 40%, 5% achieved growth of 40% to 50%, while 10% achieved growth of 50% to 60%.



24% of the businesses that reported a decline over the past 3 years reported that the decline was of 10% to 20% whereas another 24% reported the decline to be of 20% to 30%. Another 19% of the declining companies saw a decrease of 30% to 40%. Although the fall in revenue appears to be severe, it is important to remember that only 14% of the companies have reported a decline in revenues over the 3 year period.

IT & ITES industry has seen a steady growth in the past 3 years, and according to this survey, the number of companies within the industry has risen by 23% over the period – given that 19% of the companies within the sample were incorporated over the last 3 years.

A possible reason for this growth is the popularization of an existing concept which was introduced in the 1950's: "Cloud Computing" was popularized in 2006 when Amazon.com introduced the Elastic Compute Cloud, in the years to follow many other world renowned companies introduced themselves in this new concept; IBM launched "IBM Smartcloud" (2011), Oracle announced the "Oracle Cloud" (2012). These are some of the examples which illustrate the fact how important cloud computing is becoming in the IT industry's future. This lead to a paradigm shift towards portable computing hardware like Smartphones, laptops and tablets and their popularity and demand increased tenfold.

Easier access, faster and more reliable connectivity to the internet resulted in new innovations in the software Industry. An increase in the Smartphone market resulted in people investing time and money in applications which make these gadgets user friendly and convenient; therefore, a huge industry emerged across the globe; ripple effects are being witnessed in Pakistan as well.

Section 07

Industry Outlook

Markets, Sectors and Services of the Future

7.1 Markets and Sectors of the Future



The respondents were asked which market (domestic or international) they saw growing faster. 36% of the respondents saw the domestic market growing faster, whereas 63% said otherwise. 1% of the respondents did not answer.

It appears that there exists a higher potential for increasing the industry's revenue share from the international market and this element of the survey shows that the industry recognises this potential.



7.1.2 Fastest Growing International Market

Respondents operating within the international market were questioned regarding their views on the fastest growing international market. 46% of the respondents believed that USA was the fastest growing market, followed by UK (15%), Middle East (15%), EU (10%), Africa (6%) and Australia (4%). China and Far East were considered to be the fastest growing by a mere 1% of the respondents.

Our survey already provides evidence of the fact that USA is the most important international market for Pakistan's IT & ITES industry. In addition, the survey shows that this market will continue to be of the same – if not more – importance in the future.


Respondents engaged within the domestic market were questioned as to which of the domestic sectors they saw growing fastest in the future. The only major growing sector within the domestic market (supported by 31% of the respondents) appears to be the IT industry. This is followed by the education, service and telecommunication sectors (all 3 supported by 6% of the respondents). Wholesale and retail trade sector and media / advertising sector are both seen as the fastest growing market segments by 4% of the respondents. 3% of the respondents believe Banking to be the fastest growing domestic sector, whereas Manufacturing, Transportation, Textile, Power Generation, and Real Estate were seen as the fastest growing domestic sectors by 2% of the respondents each.



7.2 Service / Product of the Future

Respondents were asked which of the industry's service, in their opinion, would be the highest revenue generating engine of the future. 30% of the respondents believed Mobile Application Development to be the future of Pakistan's IT & ITES industry, whereas 14% believed that Web Application Development will be the highest revenue generating service for the industry in the future. Customised Software Development was believed to be the highest revenue generating product / service in the future by 10% of the respondents.

Section 08

Key Challenges

Underlying Issues

Since its emergence in the late 1980's, Pakistan's IT & ITES industry has faced countless challenges impeding its growth and ability to match international competition. Despite being able to achieve reasonable growth rates, compared to other local industries, the IT & ITES industry has not been able to perform at its true potential.

The broad categories of challenges faced by the industry, as revealed by this survey, include the energy crisis; absence / lack of government support; deteriorating law and order situation; poor infrastructure; lack of awareness within the domestic market; lack of good quality human resource; less than adequate quality of education and training; high services tax; difficulty in international market access; lack of domestic and foreign investment; absence / lack of payment gateways; and a high employee turnover.

It is, however, important to look at the issues collectively rather than in isolation as many of the issues can be considered to be interrelated.



8.0.1 Key Challenges Faced by the Industry

The industry is facing countless challenges that currently impede growth. Given the open ended structure of the question a large number of responses were received. The significant issues have been categorized and depicted in the illustration above. Over 30% of the respondents have identified the prevailing energy crisis as the key challenge that obstructs day to day operations of their business. Another equally problematic factor is the lack of any support by the Government. This encompasses lack or absence of funding, facilitation and recognition. Other key issues include lack of awareness with regard to IT and its benefits within the domestic market; the poor law and order situation; the underdeveloped infrastructure, which includes the unavailability of good quality internet across most of the country; lack of good quality human resource; and lack of education and training relevant to this sector.



8.0.2.1 Top Challenges: Highest Ranking



To further study the challenges faced by the IT and ITES industry a closed question was presented to the sample whereby they were required to rank the key challenges, according to their severety (1^{st} , 2^{nd} and 3^{rd}), faced by the industry out of a given set of catagories. Again, the issue of power outages due to the prevailing energy crisis topped the ranking with 30% of the respondents ranking it as the biggest issue faced by the industry, 16% as the 2^{nd} biggest and 14% as the 3^{rd} biggest issue. Lack of government support was pointed out to be the second most formidable challenge to overcome with 21% ranking it as the prime issue faced by the industry, 20% ranking it at number 2 and 18% at number 3.

A combined illustration of the above can be viewed in annexure V. To clarify the picture further, a single ranking illustration has been provided below. Weights were allocated to each rank in order to derive a single ranking i.e. 3 to highest rank, 2 to second highest rank and 1 to third highest rank, and the percentages of supporting responses multiplied by their respective weights.



8.0.3 Top Challenges: An Overview

8.1 Energy crisis

The survey indicates energy crisis and power outages to be the most prevalent challenges for the industry; identified as a key challenge by 33% of the respondents and ranked as the top most issue by 30% of the respondents. Given the nature of the industry, undisrupted power supply is of paramount importance to any business operating within this industry. For services such as BPO, disruption in service due to power outages signifies deterred competitiveness in terms of quality, at both, regional and international levels.

Ever since the energy crisis, power outages stretch up to 6-8 hours a day in urban areas and up to 10-12 hours in rural areas. This forces companies within the industry to have arrangements for alternative power sources, i.e. UPS and generators. The result is in the form of additional overheads for the companies which can either be passed onto the customers, resulting in decreased international competitiveness, or be borne by the companies resulting in decreased profits – making businesses less lucrative; hence, a plausible factor resulting in lack of investment. This problem affects the small and medium sized businesses (which make up the larger part of the industry) more severely as the additional overheads are a larger proportion of their total revenues.

8.2 Absence / lack of government support

Equating almost the same importance was the issue of absence or lack of government support, identified by 32% of the respondents during our survey and ranked as the top most issue by 21%. Pakistan saw its first electoral change of government in 2013. Before this, were a number of unofficial government changes including military take overs and a constantly uncertain political climate. The political instability has always hindered steady progress, also signifying unclear priorities, with each government holding its own set of agendas. The IT & ITES industry was rightfully given priority between 2000 and 2008, and was on the top 5 agendas of the time. It was during this time that the IT Policy 2002 was introduced which gave significant incentives to the IT & ITES Industry. However, with changing governments in 2008 and 2013, the due importance given to this lucrative industry fell tremendously. This is evidenced by the withdrawal of more than PKR 65 billion from the Universal Service Fund and National ICT R&D Fund in 2014, which were moved into the Federal Consolidated Fund for payment of the circular debt of the power sector.

The IT policy 2002 provides significant incentives to the IT & ITES industry. These include income tax exemptions, subsidisation of ISO 9001 and ISO 27001 accreditation and certification for IT companies, access to low rent software technology parks, permission for 100% equity ownership for investing foreign firms, permission for 100% repatriation of profits to IT companies, and availability of instant, high speed and reliable connectivity.

Although the policy is designed to support the IT & ITES industry, there are still issues with implementation and downward communication of the policy. Despite the subsidisation of ISO 9001 and ISO 27001, companies are hesitant to register. The issue, again, is lack of awareness with regard to these incentives as well as the slow and time consuming registration processes which discourage companies from registering.

The most prominent issue is the absence of an apex government body overseeing the IT & ITES industry. Pakistan Software Export Board (PSEB) does not fulfil this role as – although its mission statement aims to support the industry locally as well as globally – the board only takes responsibility for overseeing the export side of the industry and is not a regulatory body for the industry. The industry requires a body which could regulate the industry in order to solve the issues of trust within the international market and software piracy – specifically pointed out by 5% of the respondents during the survey. The unavailability of merchant accounts and resulting accessibility problems with international payment gateways such as PayPal within Pakistan, due to regulatory issues with the State Bank of Pakistan, forces companies to open these accounts abroad. The anonymity this brings opens doors to fraudulent activities resulting in further deterred credibility of our Industry operations within the international market.

These fraudulent activities include offering numerous online fake degrees as well as services to students of international universities for undertaking their assignments and projects (giving rise to plagiarism). The absence of regulations for protection of Intellectual Property – which prevents foreign companies from moving into Pakistan – is also a key factor which the government needs to address. Another increasing phenomenon is the availability of home based jobs where individuals are paid simply for 'viewing ads'. Such arrangements mostly abuse Google's Ad sense and other online adservices, which negatively impacts upon the industry's image.

Another important body that currently exists within the industry is Pakistan Software House Association (P@SHA). This body is a trade association between Pakistan's software houses which aims to protect the rights of its members. However, a mere existence of such an association is unlikely to serve the intended purposes to their core.

The government must also take on the responsibility, in association with bodies such as P@SHA, of providing a platform to the growing industry which can be of significant importance to the small and medium sized companies. Such companies are neglected and lack recognition. Provision of such a platform can be vital to the growth of these companies.

In order to help the industry, India can be a vital example, where the government provides support to the small IT start-ups through provision of international standard, fully operational office space. All general expenses such as electricity and gas bills are exempted for a period of time, giving optimum growing opportunity and space until the start-up becomes sustainable.

Another issue highlighted by our survey is the lack of relevant personnel within the IT and Telecom Ministry. In order to be able to understand the industry and to make it functional at an optimal level, the required personnel ought to have educational background and experience relevant to the industry.

8.3 Deteriorating law and order situation

Pakistan has been fighting the international war on terror since the 9/11 attacks on the twin towers. USA's invasion of Afghanistan dragged Pakistan initially into a supporting role in the war, and later into direct conflict within the tribal areas of Pakistan. This more than a decade long war – which is yet to end – has claimed in excess of 60,000 Pakistani lives, including civilians and security personnel. The overall economy of Pakistan continues to be severely affected. 14% of the respondents during our survey pointed this out as a key challenge faced by the industry.

The effect on the IT & ITES industry has come in several forms. Firstly, the war on terror and the resulting spree of countless terrorist attacks all across Pakistan has created a negative image in the minds of the international community. This is evident by the portrayal of Pakistan as a war torn, devastated country through various international media platforms. This negative image discourages foreign investment and their interest to conduct business in Pakistan.

Another problem arises as a result of disruption in work caused by events such as terrorist attacks which put businesses at a halt – sometimes for days. The international IT & ITES market is dependent on an undisrupted provision of services and such unplanned disruption can be a factor in deterring the competitiveness of Pakistani firms in the international market. The only IT Park in Karachi, which is one of the most troubled urban cities of Pakistan, faces a total shutdown of business followed by days of strike.

The security situation discourages foreigners from even visiting Pakistan. Entering the IT & ITES industry of Pakistan may require the physical presence of foreign professionals and those professionals are unlikely to be willing to move to Pakistan given the eminent threat to foreigners.

8.4 Inadequate infrastructure

Pakistan lacks in general infrastructure. 23% of the respondents during our survey believed lack of IT infrastructure to be a key challenge for the industry. The majority of the country's population still lives in rural areas and a major part of the country is yet to gain access to the internet. Where the population does have access, the quality of broadband connections

lags behind the rest of the world by years. This not only reduces the competitiveness of the industry against international competition, but also hinders research and development.

In order to nurture this growing industry, IT parks have an important role to play. Despite a number of IT parks being approved by the planning commission of Pakistan within some of the major cities of Pakistan, construction has not yet started. Currently only 3 IT parks exist within Pakistan; one in Lahore, one in Islamabad and one in Karachi. The World Bank has expressed interest in providing funds of \$45 million to the establishment of these parks. While the government waits for the letter of intent from the Bank, the industry continues to suffer from the lack of this service.

The launch of the 3G and 4G licenses in 2014 is considered to be a significant milestone for the industry. It would, however, be important to consider this achievement in the backdrop of the fact that by this time, the majority of the countries against which Pakistan competes and most of the developed world had been considering a move from 3G to 4G. What is of further concern is that 3G services are not yet fully available across the country.

8.5 Lack of awareness regarding IT & ITES and its benefits

As pointed out by 13% of the respondents during the survey, there appears to be lack of awareness regarding IT services and their benefits. IT & ITES is a vital part of every business within the developed part of the world. Take, for example, the fact that even the smallest of businesses make use of ERPs and other customised or of-the-shelf business management software in their routine business. This, however, is not true for Pakistan as people are not aware of the advantages of such systems and software. This has made the industry's domestic market much more limited and this may be a factor contributing to the fact that only 30% of the companies within the industry are able to depend fully on the domestic market and only 36% believe this market to show rapid growth in the future.

There is also lack of general awareness with regard to the IT & ITES industry. Career counselling for students is a factor that may be used in favour of the industry. There are currently no well-known magazines or gazettes specifically for this industry that may give the industry a certain level of exposure.

8.6 Lack of quality human resource

The lack of quality human resource is a major issue for the industry, a rooting cause for which is a general weakness in education and training within the country. A lack of quality human resource has been identified as a key challenge by 23% of the respondents during our survey; whereas 22% of the respondents believed that lack of quality of education and training was a key issue.

The IT & ITES industry is of a technical nature where sound educational qualifications and skills are essential. Compared only to Karnataka, home to India's IT industry's backbone – Bangalore – which houses over 16 universities, 133 medical schools, 134 engineering colleges and 712 general colleges, Pakistan has a total of 160 universities which are recognised by the Higher Education Commission – only a handful of which offer degrees in IT, Computer Science, computer engineering and other related disciplines. The top tier universities offering qualifications in these disciplines include NUST, COMSAT Institute of technology, National University of Computer and Emerging Sciences, Balochistan University of Information Technology and Management Science, Lahore University of Management Science and GIKI Computer Engineering and Computer Systems, which are yet far from being able to hold a place on the international university rankings. The top tier universities do not produce a sufficient number of graduates to meet the industry's demand; hence, there exists a demand-supply gap for a higher caliber of human resource. As per P@SHA chief, Ashraf Kapadia, the industry requires 15,000 graduates per year while the universities are only able to produce half the required number. Only around 1,000 graduates are produced by the top universities, who match the quality human resource requirements of the industry.

8.6.1 Capacity Building: an Issue Requiring Immidiate Redressal?



Respondents were questioned whether, in their opinion, capacity building is a major issue that needs to be addressed immidiately. The majority of the respondents (69%) were of the view that capacity building is an issue that required immidiate redressal for the industry to flourish, whereas 17% of the respondents disagreed. 13% of the respondents could not comment and responded with 'Do Not Know'.

In addition to the demand-supply gap, the majority of the graduates that are produced lack in skill and practical know-how. These graduates have no on-job experience and require significant training. This issue was also raised by a number (14%) of respondents during our survey. Companies are forced to train these graduates, incurring expenses in the form of either formal training courses for employees or through payment of remuneration to the graduates while they gain practical on-job experience – which may take more than a year. There is a dire need for training institutes which can provide graduates with an adequate level of training, which is required to bring them up to industry standards.

Adding further to this issue are the aspiring entrepreneurs; graduates who wish to eventually start up their own companies. After a significant amount of investment in the human resource for capacity building, the companies remain unable to control employee turnover. The employees that have been invested in, choose to leave their companies in order to be entrepreneurs. The issue of high employee turnover has been identified by 2% of the respondents during our survey.

There also appears to be a gap between the industry and academia, as identified during our survey (3% of the respondents pointing this out as a key issue). The IT & ITES industry is fast moving with continuous technological changes and upgrades. The universities are unable to continuously update their curriculum in this regard, which results in graduates lagging behind the industry's rapid advancements.

An important issue also arises from the 'leakage' of talent from the country – believed to be a key issue by 4% of the respondents. Many of the graduates from top tier universities offering degrees in related disciplines opt to work abroad. There are a number of reasons for this which includes higher remuneration, better career prospects, job security and higher quality of job experience etc.

There exist services within the IT & ITES industry such as BPO, customer care services or call centre services which are less technical in nature. It can be argued that a large chunk of Pakistan's population is fluent in English; however, the fact remains that this population would still require extensive training. The issue of lacking quality education and educational disparity (discussed below) limits the availability of human resource even for such non-technical services. A majority of professionals engaged in such services belong to Arts, Science and Business / Commerce disciplines of education (as revealed by the survey) with a significant proportion of these employees holding education in excess of 14 years. This is an evidence of the fact that employment in this area is not considered to be a career path, but a temporary employment or a way out of unemployment – given the economy's condition – hence, a contributory factor towards the issue of high employee turnover.

Illiteracy remains a hurdle for Pakistan with over 40% of the population still illiterate. Where people do attempt to access education, the quality is far from standard. As per a UN report published in 2013, Pakistan's health and education budget was among the lowest in the developing world. The public schools severely lack quality, where, in many areas of Pakistan, students are unfamiliar with even basics of the English language up until middle school. The standard of education varies from one public school to another depending on the area – a public school in Punjab is better than one in Balochistan. There has been a trend towards a rising number of private educational institutes; however, such institutes are not affordable by the common Pakistani man. Private institutes and schools provide a significantly better standard of education compared to public schools. The disparity created by these factors needs to be addressed through educational reforms and standardisation of education across Pakistan.

8.7 Lack of foreign and domestic investment

Lack of investment within the IT & ITES industry has been identified as a key issue by 5% of the respondents. Foreign investment within Pakistan's IT & ITES industry lacks due to the cumulative effect of all the issues raised above. These include inadequate infrastructure, law and order insecurity, power outages, political instability, lack of regulation and protection of Intellectual Property, and inadequate local human resource.

Domestic investment lacks mainly due to the attitudes of investors. People tend to invest in safer ventures. This leads to investments being focused on property, textile and agriculture, while the IT & ITES industry suffers limitation on achieving its true potential. It can be argued that a cause for this may, again, be the general lack of awareness with regard to the industry and its potential. It would be a major asset for business angels to be willing to invest in the future of the industry.

Section 09

Recommendations & Conclusion

Suggestions from the Industry, Recommendations and Conclusion

9.1 Suggestions from the Industry

A range of suggestions and recommendations were gathered through the survey for rectification of the key issues faced by the industry. The suggestions were collected on the basis of the issues identified and ranked by the individual respondents. In addition to expertise and secondary data, these suggestions have been given due consideration in formulating the recommendations.

The recommendations received through the survey for rectification of the major issues are presented below.





The suggestions received for rectification of shortage of human resource can be divided mainly into those related to education and those related to training. 30% of the respondents believe that the shortage of human resource can be rectified through provision of training according to industry requirements in colleges and universities. There is also a need for more internship programmes for graduates such as that initiated by PSEB. 46% of the respondents believe that education will be the key factor in rectification of the shortage. These respondents believe that there is need for improvement in IT sector education and the promotion of IT technical institutes by the government. University and college study curriculums need to be updated and improved with the aim of reducing the gap between the industry and academia. Other recommendations by the respondents include the need for spread of awareness with regard to the IT & ITES industry and increasing remuneration for the industry in order to attract more competent professionals.



Rectification of inadequacy of human resource:

For the rectification of inadequacy of human resource, the respondents' suggestions revolved mainly around education and training. Again, 24% respondents believed that training according to industry requirements within universities and colleges as well as initiating training programmes for graduates will be key factors for rectifying inadequacy of human resource. A few also believed that practical experience requirements should be made mandatory for graduates and that training and education should be provided by the companies for their employees. Educational factors – suggested by 51% of the respondents – included improvements in IT sector education, promotion of IT technical institutes, updating and improving the curriculum for universities and colleges reducing the gap between the industry and academia, introducing project based education for students in collaboration with the industry, and establishment of government IT institutes providing the relevant education at reasonable costs. Other suggestions, again, included spread of awareness with regard to the IT & ITES industry and increasing remuneration packages for employees in order to attract high caliber professionals towards the industry.



58% of the responses received suggest that the government should be injecting funds into the IT & ITES industry in order to counter the shortage of funds. 16% of the responses suggest that the problem of shortage of funds could be solved by providing access to international payment gateways such as PayPal. Other suggestions include attracting foreign investment, controlling inflation, provision of incentives to the industry by the government, and arrangement of seminars by public and private sector for fund generation.

Rectification of lack of government support:

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9.1.4 Suggestions for Rectification of Lack of Government Support

A large number of varying suggestions were received for rectification of lack of government support. 19% of the responses suggest that the government should provide complete support in every aspect for the industry to flourish. 8% of the respondents believe that the IT institutes need to be promoted and improved by the government. 5% of the respondents believe that the government support should be provided in the form of subsidiaries to the industry. Another 5% of the respondents believe that the government should provide support through the establishment of Software IT Parks while a same percentage of the respondents suggest that the government should take steps in order to attract foreign investment. There were also suggestions to develop and spread awareness with regard to the IT & ITES industry. Other suggestions included steps to increase private sector involvement, reduction in the overheads, such as rent, of companies operating

within the industry, creation of a central body responsible for providing platforms to the industry and ensuring fair competition so that projects are awarded on the basis of merit, steps to reduce or control corruption, resolving issues related to access to international payment gateways such as PayPal and World Pay, and measures to improve the dented image of the country.

Rectifying difficulties in market access:



Again, a large number of varying suggestions for rectifying the difficulties faced in market access were collected. 15% of the responses collected were general, suggesting that all necessary steps needed to be taken to ensure easier access to market. The remaining suggestions, received in almost equal numbers, include steps such as improving the country's overall environment, steps to ensure international market access in specific, support and facilitation to new entrants by established companies, division of business within the industry with projects being awarded to different companies rather than being concentrated with a few large companies, spread of awareness with regard to the IT & ITES industry, government support to small and medium sized companies, steps to improve the image of the country so that access to international markets can be made easier, creation of an institution responsible for maintaining a stable market, formation of a mature foreign policy and ensuring a stable exchange rate, and developing a system linking customers and companies within the industry.



Rectifying law and order situation:



Much of the suggestions received for rectification of the current law and order situation were generic, with 55% of the responses suggesting that all necessary steps to resolve the law and order issues need to be taken by the government. 13% of the responses suggest that law and order issues must be handled with the specific aim of making the country's environment conducive for business. Another 13% of the respondents believe that terrorism is a major hurdle that needs to be addressed through complete elimination of terrorism. Other suggestions include handing over the responsibility for law and order to the military, elimination of corruption from institutions such as police and army, and conducting peaceful dialogues between different religious schools of thought to eliminate religious extremism.

Rectifying poor infrastructure facilities:





22% of the respondents who answered were of the view that a general overall need for improvement exists with regard to the IT & ITES infrastructure. Another 22% of the responses suggested that there is a need for improving the quality of internet services being provided within the country. Other respondents believe that the software houses and companies should be run under government patronage, more Software Technology Parks should be established and IT related facilities increased, national E-Service created, and government support to be provided to small and medium sized companies.

Rectifying energy crises:





47% of the responses received with regard to solving the energy crisis suggested specific steps to overcome the issue. These include investing into the power sector, establishment of new dams and power plants, and an increased resource allocation for the power sector. 31% of the responses were generic in nature, suggesting, either elimination of power outages, or decreasing the periods of power outages. 10% of the respondents suggested moving towards alternative, renewable sources of energy such as wind and solar. Other suggestions include steps to conserve energy, provision of backup power sources (i.e. UPS and generators) to companies operating within the IT & ITES industry, and reducing the general utility overheads of these companies by reducing the cost of electricity.

Rectifying high employee turnover:



9.1.9 Suggestions for Rectification of High Employee Turnover

The major suggestion received by 40% of the respondents who answered, for solving the issue of high employee turnover, was offering more attractive remuneration packages to the employees in order to retain them. 20% of the responses suggest awarding scholarships to increase the performance of employees through motivation. The remaining responses are related to providing better working conditions and lifestyles to the employees along with all facilities.

9.2 Recommendations and Conclusion

Recommendations

A government apex body, to oversee and regulate the IT & ITES industry of Pakistan, should be put in place. The body should, in association with the existing bodies such as PSEB, NITB, P@ASHA as well as the IT and Telecom Ministry, develop a comprehensive IT & ITES policy and strategy. The body must take responsibility for downward communication of the policy and its thorough implementation and to help facilitate the industry by developing a communication channel between the industry players and the government.

Issues with regard to opening of merchant accounts with renowned payment gateways such as PayPal and World-Pay must be resolved. Regulations must be imposed to counter the online fraudulent activities to improve the image of the industry within the international market.

In addition, strict regulations must be imposed for the protection of Intellectual Property to improve foreign investor confidence.

Responsibility for spread of awareness with regard to the IT & ITES industry must also be taken on by such an apex body. By collecting information from the industry and academia, a scheme for a routinely published magazine focused on Pakistan and the international IT & ITES industry may be initiated. The industry also lacks platforms to support the growing small and medium sized companies. Such a platform should be initiated, which consists of state of the art establishments to support these companies and provide opportunities to them to exhibit their potential and developed ideas.

Expatriates appointed at notable positions, working with world renowned IT powerhouses should be given incentives in order to encourage them to invest their expertise for the betterment of Pakistan's IT & ITES industry.

A regulating body should be put in place to bridge the gap between international and local companies by holding exhibitions and seminars, exhibiting industry capabilities to prospective business providers and aiding opportunities of international business to local companies.

Formation of an Apex body could play a pivotal role between IT education institutes and IT companies by making an online portal to register all graduating students; henceforth, bridging the gap between academia and industry which would in turn reduce the supply-demand gap for the required human resource in the IT & ITES industry, as identified in our survey analysis earlier.

IT software houses should invest in research and development departments in top tier universities. The apex body should regulate these developments, which could in turn produce higher caliber human resource for the IT & ITES industry.

The government must fully support the new entrants by providing international standard optic fiber connections and fully functional office spaces within developed IT parks. Government should also provide necessary support and guidance free of cost initially. The new start-ups should also be exempted from expenses incurred on general utilities. This support should extend until the entity achieves financial sustainability. A detailed system for monitoring these companies throughout this period must also be developed to ensure that the desired outcomes are achieved.

The lack of international standard IT parks must also be addressed. Government must allocate a budget for the establishment of the IT parks which have been approved by the Planning Commission, instead of relying on the expected financial support by the World Bank - which may or may not be provided.

Necessary steps need to be taken to resolve the issue of non-availability of high quality human resource. The government, in collaboration with the Higher Education Commission and the universities, must arrange scholarship programmes for the university students within related fields. In addition, linkages should be developed with well-known international universities for initiating exchange programmes in order to enhance the quality of human resource in the IT & ITES industry.

To minimise the gap between the industry and the academia, universities must also play a vital role by updating their curriculum in line with the industrial innovations and changes. As with medical and accounting professions, experience is as important as the academics. On-job experience along with academic studies should be prioritised by giving due importance to internship programmes. This will require linking the academia with the industry.

The burden of training the human resource must be removed from the individual companies and should be taken on by the government instead. We recommend the establishment of a central chain of training institutes by the government, in association with other bodies such as P@SHA, PSEB and HEC, for the fast-track training of graduates before formally entering the industry. The institutes should maintain a database of trained graduates as well as those under training and act as a link between the academia and the industry, through which companies should be able to fulfil their specific human resource requirements.

An institute with sole propose of helping the IT graduates achieve industry experience through short courses should be established. Therefore, reducing the amount of time and money the IT industry invests in these new graduates to bring up to industry standards.

Various platforms should be provided where students can exhibit their skills in software development and other IT related sectors to people who might be interested in such ideas and would materialise them in reality by investing in them. This would create a positive environment in which venture capitalism might take root in the IT & ITES industry. This could be taken to another level by making this platform accessible to foreign investors; hence, increasing the chances of foreign investment in the industry.

Conclusion

In this survey, a sample of 300 companies was selected. 10 major cities of Pakistan - Islamabad, Lahore, Karachi, Faisalabad, Multan, Jhelum, Hyderabad, Peshawar, Sargodha, and Abbottabad - were included in this survey. Data was collected using a structured questionnaire, which was finalised after a thorough pretesting.

Majority of the companies (59%), which participated in survey are locally based, while 13% quantify as foreign subsidiaries. In aggregate, 74% of the companies serve the domestic market, while 69% serve the international market. Of these, only 19% hold CMMI Certifications, while a mere 12% hold relevant ISO and other certifications among. The aforementioned certifications deem an integral part in the credibility of companies in IT & ITES Industry, as suggested earlier in the report; hence, due significance should be given to iterate their incorporation.

Of the total revenue generated by the IT & ITES Industry, 55% is generated from the domestic market, whereas 45% is earned from the international market. USA is the most significant international market catering a total business of 69%.

Average salary of the IT & ITES Industry computes to PKR 35,000. Companies, on average, have 45 employees, of which gender segregation shows an austere male domination with 93% male employees and only 7% female employees. This spread could be mainly because of the intrinsic nature of the Industry as it involves odd working hours, especially in BPOs.

It is, however, a rapidly growing industry. Survey revealed 23% growth in the number of companies with 29% increase in the average estimated revenue growth over the last 3 years. There also has been a steady growth in employability in this Industry as there is 20% growth in the number of employees over the last 3 years.

IT & ITES Industry is, indeed, a rapidly growing Industry globally. It encompasses all aspects of the global economy today and has immense potential to boom Pakistan's economy ensuring exponential growth in the total GDP. Survey findings reveal that Mobile Application Development and Web Application Development are the key focal areas as they would prove to be the highest revenue generating services in the future. With the key challenges identified earlier in the report, due consideration is ought to be given to the recommendations in order to strengthen the IT & ITES Industry, aiding it to perform at its true potential.

Annexures

Annexure I: Sample

Sr. No	City	Universe	Field Activity	Sample
1	Rawalpindi / Islamabad	874	64	70
2	Karachi	862	73	70
3	Lahore	819	80	70
4	Peshawar	97	32	30
5	Faisalabad	20	16	15
6	Multan	12	13	10
7	Gujranwala	10	0	5
8	Abbottabad	7	5	5
9	Sialkot	7	0	5
10	Hyderabad	7	7	5
11	Sargodha	2	5	5
12	Jhelum	1	5	5
13	Sukkur	1	0	5
	TOTAL	2719	300	300

Annexure II: List of Sampled Companies

Islamabad				
Serial Number	City Serial Number	Name	Address	
1	1	Solutions (Pvt.) Limited	Office No. 123, 1st floor, Malik Dad, Main Murree Road, Rawalpindi	
2	2	NEXTBRIDGE Pvt. Ltd.	Evacuee Trust, F-5/1, Islamabad	
3	3	I Resources	1st Floor Evacuee Trust, F-5/1 Islamabad	
4	4	NETT TEC Pvt. Ltd.	2nd Floor, Evacuee Trust, F-S/1 Islamabad	
5	5	Cogilent Solutions Pvt. Ltd.	2nd Floor, Evacuee Trust, F-5/1 Islamabad	
6	6	Work Plains	Suite # 7, 2nd Floor, Ahmed Centre 1-d Markaz Islamabad	
7	7	PM Tech	Office No. 1, 3rd Floor, Anique Arcade I-8, Markaz	
8	8	Web Hive	Office # 06, 3rd Floor, Anique Arcade, I-8 Markaz, Islamabad	
9	9	Fortune	Office #3, 3rd Floor, Ahmed Centre, I-8 Markaz	
10	10	e-Juicy Solutions	Office # 13, 3rd Floor, Ahmed Centre, I-8 Markaz, Islamabad	
11	11	X Flow Research	STP, I-9/3 Basement, Islamabad	
12	12	Glink Softs	Off 18, 3rd Floor, Satellite Shopping Centre, Rawalpindi	
13	13	Tecnex System Pvt. Ltd.	H # 241-A, St # 13, Chaklala Scheme III, Rawalpindi	
14	14	Fincon Consulting Pvt. Ltd.	House #798, Street 16, Sector 1-8/2, Islamabad	
15	15	MTDBI (Medical Transcription & Database Institute	222 Serbas Busluss Center, Commercial Market, Rawalpindi	
16	16	Softonix Solution	6B Commercial Market, S.Town, Rawalpindi	
17	17	Cdigital Pvt. Ltd.	House 389 C Street 85, I-8/4, Islamabad	

18	18	Software Base Solutions	House No.51, Street No.96, Sector I 8/4, Islamabad
19	19	United software and technologies international (pvt.) Limited	BUILDING # 433, ST. 57, I-8/3, ISLAMABAD Islamabad Capital Territory
20	20	AMPM (Advanced Medical Practice Management)	H # 10B, Main Sumbal Road, F-10/3, Islamabad
21	21	Hot Sol	Office # T-8, 3rd Floor, Sardar Arcade II, G-II Markaz, Islamabad
22	22	Bently Pvt. Ltd.	307, 3rd Floor, Evacuee Trust Complex, Agha Khan Road, F-5/1, Islamabad
23	23	Kamal Systems	Office # 3, Ground Floor, Hi-Tech Centre, Street 39, I&T Centre, G- 10/4, Islamabad
24	24	E-Strats	#44, Street 116, G-11/4, Islamabad
25	25	Harbinger Solution	Suite #18, 3rd Floor, Select Center, F-11 Markaz, Islamabad
26	26	Encore	#2, Hi-Tech Centre, St. 39, I&T Centre, G-10/4, Islamabad
27	27	Aiz Tek	Office # 6, 3rd Floor, Panorama Plaza, G-11 Markaz, Islamabad
28	28	Generic Web Solutions	H # 761, St # 49, Ibn-e-Sina Road
29	29	Gravity Innovation	L01, Afzal Plaza, G-10/1, St 35, IFT Center
30	30	DPL Pvt. Ltd.	2nd Floor, STP F-5/1, Islamabad
31	31	Makabu	STP, 4th Floor, 5-A, Constitution Avenue, Islamabad
32	32	EGS	3rd Floor, Software Technology Park, 5-A Constitution Avenue, Sector F- 5/1, Islamabad
33	33	Ora-Tech Pvt. Ltd.	House No 118A, Gusia Colony, Saidpur Road, Pindora Parade, STP Tower, F-5/1, Islamabad
34	34	Cambridge Communications	Office # 12, 3rd Floor, Ahmed Centre, I-8 Markaz, Islamabad
35	35	Gol Technologies (Pvt.) Ltd.	Office # 5, 3rd Floor, Ahmed Centre, I-8 Markaz, Islamabad
36	36	XERMS (Pvt.) Ltd.	Office 17, 1st Floor, VIP Plaza, I-8 Markaz, Islamabad
37	37	Knowledge Corporation	Office # 312, 3rd Floor, Lord Trade Center, Hamza Chowk, F-11 Markaz, Islamabad
38	38	Xorlogics	Office no. 2, 2nd Floor, Ahmed Center, I-8 Markaz, Islamabad
39	39	Smart IS	House # 78, Street # 24, Sector F-11/2, Islamabad
40	40	Clifsol Communication	Office # 27, Aries Tower, Shalimar Floor, Shamsabad, Murree Road, Rawalpindi
41	41	Teresol	House No. 220-A, Street No. 39, F-11/3, Islamabad
42	42	Alpha System	Office # 15, 3rd Floor, Mahmood Plaza, Fazal-e-Haq Center, Blue Area,Islamabad
43	43	New Vision Technologies	Road, Rawalpindi
44	44	Creadios	Munaf Plaza, 3rd Floor, Flat # 6, Chaklala Scheme 3, Rawalpindi
45	45	NETPAQ	4 Adeel Plaza, Fazl e Haq Road, Blue Area, Islamabad
46	46	360 Logistic	Office 16, 3rd Floor, Safdar Mansion, Blue Area, Islamabad
47	47	Ingenious Sign	1-B, 2nd Floor, City Plaza, 5th Road, Satellite Town, Rawalpindi
48	48	Nad-E-Ali Network & Solutions	Office No. 2, Flat No. 11, 3rd Floor, Muzaffer Chamber, Near Rahat Bakers, Fazl-E-Haq Road, Blue Area, Islamabad
49	49	5G Networks	Office # 1401-2, 14th Floor, ISE Towers, Blue Area, Islamabad
50	50	EGS / EHA (Pvt.) Ltd.	No. 314-C, STP1, F-5/1, Islamabad
51	51	AtoZ Networks Pvt. Ltd.	Fazal Haq Road, Office No. 311, Blue Area
52	52	Tranchulas	2nd Floor, Evacuee Trust Complex, F-5/1, Islamabad
53	53	Ovex Tech Pvt. Ltd.	1st Floor, STP, I-9/3, Islamabad
54	54	ITE (Information Technology Experts)	Office # 16-B, Ratta Mansion, 69-West, FazI-e-Haq Road, Blue Area, Islamabad
55	55	Union Mark Pvt. Ltd.	House # 6-A, Street # 1, Chaklala Homes, Khayaban-e-Tanveer Road, Chaklala Scheme # 3, Rawalpindi

56	56	Software and Technology Innovators	House # 2, Dar-ul-Salkeen, Sohan, Islamabad
57	57	Ai Soft	Office No. 1, 2nd Floor, Naseem Arcade, I-9 Markaz, Islamabad, Pakistan
58	58	Extreme Engineering Solution	65-E, Pak Pavilion Plaza, Fazl-e-Haq Road, Blue Area, Islamabad
59	59	Aurora Solutions	1208, Floor 12, ISE Tower, Blue Area, Islamabad
60	60	M-Interactive	Basement, STP, I-9/3, Islamabad
61	61	Discrete Logix	STP, I-9/3, Islamabad
62	62	Vizteck	STP, Industrial Area, I-9/3, Islamabad
63	63	A.Zee Internet Service Provider	Bhatti Plaza, Banars Colony, Chaklala
64	64	Haris Institute	Off 6, 71/A, Satellite Shopping Center

Faisalabad				
Serial Number	City Serial Number	Name	Address	
65	1	IT Experts	P-207, Gulifshan Colony, Jhang Road	
66	2	Vista Bit Technologies	28-29-30, Second Floor, Kohinoor-One, Jaranwala Road	
67	3	Creative IT Solution	Saifabad No.1, Street # 7, Jhang Road	
68	4	W Developers	Kohinoor City Plaza, Jaranwala Road	
69	5	SEO Web Consultant	Koh-e-Noor 1 Plaza, Office # 99, 2nd Floor	
70	6	01 Objects	185/B, Batala Colony, Near Tanki Stop	
71	7	J. K. Soft Technologies	Office No. 148, Circul Road, Near PIA Office	
72	8	The Instant Solutions	Shop # 24, Kohinoor-1 Plaza, Jaranwala Road	
73	9	Delta Soft	Office No. 2, 3rd Gallery, 2nd Floor, Rex City	
74	10	Appcotech	Office # 1, 1st Floor, Shami Plaza, D Ground	
75	11	Digital Softs	Office # 1, 2nd Floor, 3rd Galleria, Rex City	
76	12	SMI Soft Technologies	Office # 37, 1st Floor, Kohinoor One, Jaranwala Road	
77	13	Sever Soft Information Technologies	Office No. 41, 2nd Floor, Kohinoor One, Jaranwala Road	
78	14	The Solutions	Off # 28, 1 st Floor, Kohinoor 1, Jaranwala Road	
79	15	E.Box Systems	1426-B, People's Colony No. 1, Pilot Ground	

Abbottabad

Serial Number	City Serial Number	Name	Address	
80	1	HCP	Office No. 4, IT Park, Maudian	
81	2	Techliance	Office # 3, IT Park	
82	3	Nexus Web Solutions	Office # 7, IT Park	
83	4	Techno Softwarez	Office No. 5A, IT Park	
84	5	iDeveloperz	Office # 8a, IT Park	

Hyderabad

Serial Number	City Serial Number	Name	Address
85	1	Divs & Pixel	Bungalow 202, Block-D, Latifabad Unit 7
86	2	Arena Multimedia	B-1, Block B, Railway Co-operative House Society, Main Auto Bhan Road, Unit # 3, Latifabad
87	3	IT Group World	B-167, Unit No. 7, Latifabad
88	4	Avenaz Academics Solutions	5/2, CB Railway Society, Latifabad # 3

89	5	MIT Software Solution	House # B2/18/8/2, 1st Floor, R.E.C.H Society, Main Autobhan Road
90	6	Bluechip Technologies	Chirag Complex, Unit No. 8, Latifabad
91	7	Zeeshsoft	Saddar Doctors Line

Peshawar			
Serial Number	City Serial Number	Name	Address
92	1	IT Artificer Software House	FF-704, 1057 Deans Trade Centre
93	2	Telic Technology	FF-233, Deans Trade Center
94	3	Soft Depth Solutions	FF-256, Deans Trade Center
95	4	Anjum Software Solution	FF-230, Deans Trade Center
96	5	Smart Bakhtar Solutions	FF-666, Deans Trade Center
97	6	Tech-Wizards	FF-730, 1st Floor, Deans Trade Center, Saddar
98	7	Stepnex Services (Pvt.) Ltd.	FF-51, Deans Trade Center, Islamia Road, Peshawar Cantt
99	8	MC Network	FF-04, IT Park, Deans Trade Center
100	9	Trend Micrologics	FF-232, IT Park, Deans Trade Center
101	10	Mazhar Enterprises	401-B, City Towers, University Road
102	11	Logic System	16-E, 3rd Floor, New Spinzer IT Towers, Near GulHaji Plaza, University Road
103	12	Althea Technologies	Mughal Building, Zaynab Colony
104	13	No Limit	FF-338, Deans Trade Center
105	14	A2Z E-Payments	7 Deans Trade Center
106	15	Deans ICT Services	FF-1023, Deans Trade Center, Islamia Road, Peshawar Cantt
107	16	EyeDeology IT Solutions	Office # 3, 6th Floor, Bilor Plaza, Saddar
108	17	U Software Solutions	FF-184, Deans Trade Center
109	18	FEND (Finance Energy & Defence Consultants)	FF-490, Deans Trade Center
110	19	Precise Technology	FF-246, Deans Trade Center
111	20	IT Oblast	FF-624, Deans Trade Center
112	21	Net Miracles	FF-560, Deans Trade Center
113	22	Famz Solutions	FF-168, Deans Trade Center
114	23	Invincible Technologies	FF-250, Deans Trade Center
115	24	Multi-Biz Services	FF-32, Deans Trade Center
116	25	Airband Communications	FF-97-99, IT Park, Deans Trade Center
117	26	Broadway Solution	FF-18, Deans Trade Center
118	27	Shaheer Solutions	TF-338, Deans Trade Center
119	28	Sampotek Webzone Inc.	FF-110, Deans Trade Center
120	29	IT Intellisense	FF-1009, Deans Trade Center
121	30	Next Technology	Gulbahar No.3
122	31	Gravity IT Solutions	FF-577, Deans Trade Center
123	32	iFahja	FF 393, iFahja, Main Lobby, Near Masjid Gali, Deans Center

Multan

Serial Number	City Serial Number	Name	Address
124	1	Next Bridge	601, United Mall, Abdali Road
125	2	Virtual Base	20-A, 21-A, 22-A, Ali Arcade
126	3	Jin Technologies	Suite B-F 1/5, Chen-One Tower, 74 Abdali Road
127	4	Edusoft	Bakhtawar Hall, 1st Floor, Khawar Center, SP Chowk
128	5	Software Technologies	22, 1st Floor, Khan Medical City, Nishter Road
129	6	Softronix	Golden Heights, Opposite High Court, Near KFC
130	7	IAG Soft	674-C, Opposite Jalal Masjid Park, Gulgasht
131	8	Softrino	R-AII, Arcad Near Mobilink Office and Upper Nadeo Office
132	9	Zeddindex	Top Floor, Subway Sandwich, Tehsil Chowk, Gulgasht
133	10	Ideafist	621-C Gulgasht
134	11	Softinn	732, Muslim Town, Masoom Shah Road, Near Jameh Aloom
135	12	iCode Solutions	Shop # 5, Tasawwar Ali Plaza, Al-Falah Market, New Multan
136	13	Abacus	1&2, 1st Floor, Hajvery Arcade, Kutchery Road
137	14	ST Learning Training Institute	3-1st Floor, Murad Market, Opp Govt. Pilot Secondary School, Abdali Road

Sargodha

bargoana				
Serial Number	City Serial Number	Name	Address	
138	1	PaperPk.com	University Road	
139	2	Earncom Online	Shop No. 111, 1st Floor, Al-Rehman Trade Center	
140	3	MicroTel	319-Y, Iqbal Colony	
141	4	Fire Solutionz	Shop No. FF-142, Al-Rehman Trade Center, University Road	
142	5	Softnology Systems	Plot No. 1, Main Khawaja Market, Farooqa	

Jhelum

Serial Number	City Serial Number	Name	Address
143	1	Micro Eye Base (Pvt.) Ltd.	Soldier Plaza, Opp Markaz Municipal Office
144	2	Code Let	Shabbir Plaza, Shandar Chowk
145	3	Yokuni	Bilal Town, Near Commerce College
146	4	Jhelum Soft	Office # 1, Mirza Market, Naya Mohallah, Eid Gah Road
147	5	Software Store	Soldier Plaza, Civil Lines

Lahore			
Serial Number	City Serial Number	Name	Address
148	1	Cat Marketing Systems	29, Queens Road
149	2	Binary Tech	106 1st floor, Siddique Trade Center, Gulberg
150	3	Systems Software House	Aziz Avenue, Canal Park
151	4	Inbox Business Technologies	5th Floor, Arfa Karim Technology Park
152	5	Softiz Syndicate	87 Ata Turk Block, New Garden Town
153	6	Metropolitan Solutions	T-7, 3rd Floor, Grace Center, Jail Road
154	7	Bezwel International	J-3 Grace Center, Jail Road
155	8	Customs Today	627, Siddique Trade Center, Gulberg

156	9	E-Fine Trend	Green Complex, Ferozpur Road
157	10	Imanami Pakistan	306-A, 3RD FLOOR, SIDDIQ TRADE CENTRE, 72 MAIN BOULEVARD
158	11	Kaya Systems	508, 5th Floor, Siddique Trade Center, Gulberg
159	12	Info Comm Technology	Off # 14, 10th Floor, Arfa Software Technology Park
160	13	Virucide Tech	711, Siddique Trade Center
161	14	Pantera	Suite No. CC2, 5th Floor, Arfa Center
162	15	E Carol Services	Arfa STP
163	16	Baker Tilly Mehmood Idrees Qamar	188 D-1, Model Town
164	17	Systems Ltd	Lahore Chamber of Commerce Building
165	18	Ilmasoft	10-15, Arfa STP
166	19	Logica IT	Hall 2, 7th Floor, Arfa STP
167	20	Parallel Horizons Technologies	4th Floor, Siddique Trade Center, Gulberg
168	21	Amigos Software	367, 2nd Floor, Siddique Trade Center
169	22	Collection Solutions	Off # 304, 3rd Floor, Eden Tower, Gulberg
170	23	Think E Systems	73 - Main Boulevard, Cavalry Ground
171	24	Intech Process Automation	315 - H - III, Johar Town
172	25	HBS Technologies	700 - 701, 7th Floor, Al-Hafeez Center, Gulberg
173	26	Gaminations	108 - J-1, Johar Town
174	27	Strategic Systems International	17/J-1, Main Canal Road, Johar Town
175	28	Ebryx	Off # 1, 4th Floor, Arfa STP
176	29	Bitlogix	702, Al-Hafeez Shopping Mall, Gulberg
177	30	Firebolt63	101, 1 st floor, Ibrahim Trade Center
178	31	Gazambo	204, Siddiq Trade Center, Gulberg
179	32	Karzansoft	Off # 530, Siddiq Trade Center, Gulberg
180	33	NM Solutions	138-C, BOR Housing Society, Johar Town
181	34	Euro Asia	505, 5th Floor, Siddiq Trade Center, Gulberg
182	35	Software Solution	B 11-K, Model Town
183	36	Visual Soft	19-A, Model Town
184	37	Uworx Services	401-B, City Tower, Gulberg
185	38	Cybernet	32 - Ali Block, New Garden Town
186	39	Innovation Technology Design	Main Cavalry Ground, Near Bridge
187	40	Android Developers	Myown Software House, Arfa STP
188	41	Virtual Pros	05-CC2, Arfa STP
189	42	E-Cant Services	B46, 7th Floor, Arfa STP
190	43	Vision East	91 - 1st Floor, Bank Square, Model Town
191	44	Soothmedia Technologies	21 - 4th Floor, Al-Lateef Center, Gulberg-III
192	45	Vendevo	Suite No. 116, 1st Floor, Siddiq Trade Center
193	46	Apex Soft	217, Siddiq Trade Center
194	47	Corvit Networks	14-D/1, Ghalib Road, Gulberg III
195	48	Cambridge Docs	Suite No. 507, Land Mark Plaza, Jail Road
196	49	Webging I.N.T	40G, Gulberg III

197	50	Sunstar	Off No. 406, 4th Floor, Siddiq Trade Center, Gulberg
198	51	Ascertia	Suite 312, 3rd Floor, Siddiq Trade Center, Gulberg
199	52	Virucide Technology	Off No. 711, Siddiq Trade Center, Gulberg
200	53	IT Bees	77-K, Commercial Market, Phase-I, DHA
201	54	Technosoft	35-M, Civic Center, Model Town
202	55	Mansha Brothers	17-A, Commercial Plaza, Sector-XX, Phasae-III, Khayaban-e-Iqbal, DHA
203	56	Multilynx	5A-XX, Commercial Area, DHA
204	57	Xelleration	526 - 5th Floor, Siddiq Trade Center
205	58	Starlite Services	530 - 5th Floor, Siddiq Trade Center, Gulberg
206	59	Auto-gistic	239, CCII, Main Road, Phase-V, DHA
207	60	Xoho Tech	Office # 16, 2nd Floor, Ross Residencia, Canal Bank, 1 - New Campus Road
208	61	Solutions Answers	Suite No. 37, 2nd Floor, Al-Latif Center, Main Boulevard, Gulberg-III
209	62	Meticode	64 - A1, Pindi Stop, Township
210	63	Fast Services	10-10, Arfa STP
211	64	Graphic Solution	789, 4th Floor, Siddiq Trade Center
212	65	Web SAA	Off No. 1, Cukku Market, Main Walton Road
213	66	Server Sea Hosting	Suite # 26 & 27, Upper Ground Floor, Century Tower, Kalma Chowk
214	67	Copex	Model Colony, Gulberg III, Ali Tower
215	68	Bright Minds Transcription Service	55-2-C-I, Township
216	69	Infotech	Gulberg II, 12N, Near Pepsi Factory
217	70	Vision Telecom	101, 1st floor, Ibrahim Trade Center, Barkat Market
218	71	Tipu Associates	113-A, Babar Block, New Garden Town
219	72	Nextdridge	427-G4, Johar Town
220	73	Game Storm	Off # 17, 8th Floor, Arfa STP
221	74	Bright Minds	55-2 C-I, Ghosia Chowk, Township
222	75	ASL Worldwide Freight & Logistics	Off # 511, 5th Floor, Siddique Trade Center
223	76	Easy Taxi	07-06, 7th Floor, Arfa Software Technology Park
224	77	Coure MD	Main Boulevard, Commercial Area
225	78	Net Revelation	509, 5th Floor, Siddique Trade Center
226	79	E2E Supply Chain Management	427, 4th Floor, Siddiq Trade Center, Gulberg
227	80	Izhar Monnoo Developers	1.5 km, Defence Road, Off Raiwind Road

Karachi

Serial Number	City Serial Number	Name	Address			
228	1	Itim Systems	Suite # 503, Progressive Centre, Shahrah-e-Faisal			
229	2	5I Creations	82-C, 11th Commercial M-I P/II, DHA Ext			
230	3	Canvex Interactive	8th Floor, Ibrahim Trade Tower			
231	4	Mobitizing	Suite # 505, 5th Floor, Progressive Center, Main Shahrah-e-Faisal			
232	5	MAMA Enterprises	Lakhani Arcade, Mezzanine Floor, Bahadurabad			
233	6	7Nsoft Systems	204, Ibrahim Trade Tower, Plot # 1, Block-7, Shahrah-e-Faisal			
234	7	M.Tech	Bungalow # 46, Model Colony			

235	8	Systems Ltd	Alcop House, Baloch Colony, Shaheed-e-Millat Road
236	9	Ifrasoft	107, Tariq Center, Tariq Road
237	10	Utrack	B-6, Star Shelter, Gulistan-e-Johar, Block 18
238	11	M. Adnan	Block 141-D, PECHS
239	12	Sindh Multimedia	Building 2 & 3, Siddiqui Area, 36 C, Korangi-5
240	13	Efro Tech	12-C, Block 6, PECHS
241	14	Relacom	33-K, PECHS, Block-6
242	15	AucTechnologies	E-4, Block-7/8, KCHS, Shaheed Millat Road
243	16	Matrix Systems	# 605, Progressive Square, PECHS Block-6
244	17	Plumsmedia	Suite # 402, Progressive Square, Block-6, PECHS
245	18	Evincible Solutions	C-79, Block-A, North Nazimabad
246	19	Technosys	# 402, Anum Empire, Shahrah-e-Faisal
247	20	Syntex Solutions	56-D, KDA Scheme-I
248	21	HRS Global Solutions	46-D, PECHS, Block-6, Fortune Center, Shahrah-e-Faisal
249	22	Abbusys	Plot # 222, Block 7/8, Justice Inamullah Road
250	23	Ebone Network	Plot # B-85, Block 10, Gulshan-e-Iqbal
251	24	ArmTech Technology	110, Forum, Clifton
252	25	Axact	Axact House, Axact Street, Main Khayaban-e-Ittehad, Phase-VII, DHA
253	26	Solutions Heights	124-D, Navy Housing Scheme, Zamzama, Clifton
254	27	MC Inc	608, 6th Floor, Anum Empire, Block-7/8
255	28	Media Logic	A-292, Block 2, Gulshan-e-Iqbal
256	29	Office Automation Services	B-98, M.Ali Society
257	30	Vistech Solutions	Plot 86,87, Sector 34, Korangi Industrial Area
258	31	Softech Intelligence	C-13, Block-5, Gulshan-e-Iqbal
259	32	Router Tecnet	Plot SB-5, Block 13C, Office No. 7, Kehkashan Complex, Gulshan-e- Iqbal
260	33	Millennium Technologies	72/F, 9th Commercial St, DHA VIII
261	34	WindStorms Stadus	302, Gohar Chamber, Plot A-2, Block 7/8
262	35	Arpatech	302, Beaumont Plaza, Civil Lines
263	36	Travel Solutions	302 Tariq Center, Block-2, PECHS
264	37	Advanced Communications	M-14-16, Beaumont Plaza, Civil Lines
265	38	Moftak Solutions	72/F-1, 9th Commercial St. Phase VII, DHA
266	39	Avatar Controls	201, 2nd Floor, Beaumont Plaza, Civil Lines
267	40	Data Flat	807/A Japan Plaza, M.A. Jinnah Road
268	41	Techtics	Plot 84-C, 21st, Commercial Street, DHA
269	42	IT Conselling and Services	901-904, Caesars Tower, Shahrah-e-Faisal
270	43	Sysverve	C-69 F Mezzanine Floor, 24th Commercial St.
271	44	Aidatech	304, Japan Plaza, M.A. Jinnah Road
272	45	American Technologies	608, Caesars Tower, Shahrah-e-Faisal
273	46	Web Solutions	805, Business and Finance Center, Shahrah-e-Faisal
274	47	Value 1 Messaging	40-F, 2nd Floor, MACHS
275	48	Pakistan Office Products	1048, Hyderabad Colony

276	49	Softec Worldwide	Suite # 1017, Caesar Tower, Shahrah-e-Faisal
277	50	Elite Web Zone	Office No. 22, H. J. Center, Block 13/B, Gulshan-e-Iqbql
278	51	E Development Company	E1, 5th Floor, OSIF Center, Block 13/A, Main University Road, Gulshan-e-Iqbal
279	52	Xiber Soft	B-1, 1st Floor, Sohail Center, Block-8, Gulshan-e-Iqbal
280	53	Clentouch Software	suite C-2, 3rd Floor, Osif Center, BI 13-A, Gulshan-e-Iqbal
281	54	Webzone	FI-4/20, 1st floor, Suite # 5, Block-5, Main Rashid Minhas Road, Gulshan-e-Iqbal
282	55	Virtual World Communications	Off 506, 5th Floor, Westland Trade Center, Block 7/8, Shahrah-e- Faisal
283	56	Super Technologies	401-A, 13-D/2, Gulshan-e-Iqbal
284	57	Soft Techno Company	Al Humani Center, #01, Nursery, Shahrah-e-Faisal
285	58	M Net Services	172/P, Block-2, PECHS
286	59	Alpha Technologies	401 Business Arcade, Shahrah-e-Faisal
287	60	Bytes Technology	Unicenter 1014, I I Chandrigar Road
288	61	Pixus Technology	102, Progressive Center, Block 6, PECHS
289	62	Indus Business Works	5th Floor, Dawood Center, MT Khan Road
290	63	Premier Software	201, Business Plaza, Munter Haffer Road
291	63	Hayat Computer	204, Clifton Center, Clifton
292	64	Al Hassan Systems	WH-41 Techno City Shopping Mall, Hasrat Mohani Road
293	65	Rastek Technologies	Classic Center, C-15, Block 16, Gulshan-e-Iqbal
294	66	Interlink Technology	Z-9M, Comm Area, Baloch Colony
295	67	eDrive Technology	31-D, Block-6, PECHS
296	68	Western Computers	Star City Mall, 11 th Floor, #1114, Saddar
297	69	ACS	50-F, Block-6, PECHS
298	70	Intersource	50-F, Block-6, PECHS
299	71	Aptech	Suite # 202, 2nd Floor, Progressive Center, Main Shahrah-e-Faisal
300	72	Mushko Printing Solutions	2nd Floor, Oosman Chambers, Abdullah Haroon Road

Annexure III: Questionnaire

Pakistan IT & ITES Industry Survey 2013

Final Pretest

Project Code: QN-236

Interview starting t	ime:	-						
City:								
Karachi	1	Lahore	2	Rawalpindi/	Islamabad	3	Multan	4
Peshawar	5	Faisalabad	6	Gujranwala_		7	Hyderabad_	8
Sialkot	9	Sargodha	10	Sukkur		11	Kasur	12
Jhelum	13							
		R	esponder	t's Information	ı			
Company Name:								
Respondent's Name	2:			Designation:	E0	ducation ualificati	al on :	
Address:								
Business Owner's N Respondent:	Name if o	ther than		Business Owner Qualification:	Educational			
			Company	y Information				
Company Type:	Sole Pro	oprietorship 🗖	Partr	nership 🗖	Pvt. Ltd 🗖	Р	ublic Ltd 🗖	
Nature of the Comp	oany: Lo	ocal Company 🗖	Forei	gn Subsidiary 🗖	Have Fron	t Office	s Abroad 🗖	
CMMI Level: 1	2	3 4 5						
ISO Certification:	Yes: 🗖	Which Certification	on:	No: 🗆				
nterviewer's Name: .		Code:	Suț	pervisor:	Back Cl	hecker:		
Note for Interviewer:								
i. The interview	wer should	read all the questions	and instruct	ions before the interi	view. In case of any	v ambigui	ty, the interviewer	should
ask the supe	ervisor for	clarification.				-		
ii. Interview sh	ould be cor	nducted with the Busine	ess Owner /	CEO / Concerned	Manager who is r	esponsible	for taking key dec	risions.

Part-I General

Q1. I would like to start with asking for your views as to what are the key challenges/problems that the IT & ITES industry is currently facing in Pakistan?

سوال نمبر1: سب سے پہلے تو میں آپ کی رائے جاننا چاہوں گا کہ پاکستان میں IT اور ITES انڈسٹری کو کیا کیا مسائل درپیش ہیں؟

(Show Card and write 1, 2, 3 in Grid 1 in the light of the response)

سوال نمبر 2: رائے دینے کا شکریہ۔ اب میں آپ کے سامنے IT اور ITES انڈسٹری کے چند عمومی مسائل کی لسٹ پیش کروں گا۔ براہِ مہربانی اہمیت کے لحاظ سے تین سب سے اہم مسائل کی نشاندہی کریں،یعنی سب سے اہم مسئلے کو نمبر 1دیں، دوسرے اہم مسئلے کو نمبر2،اور تیسرے اہم مسئلے کو نمبر 3دیں۔

	Grid 1						
	Challenges	Ranking (Top 3 only)					
1	Shortage of human resource						
2	Less than adequate quality of human resource						
3	Shortage of funds						
4	Lack of Govt. support						
5	Difficulty in market access						
6	Law & order situation						
7	Poor infrastructure facilities						
8	Load shedding						
9	Employee Turnover						

(کارڈ دکھائیں اور جواب دہندہ کے جواب کی روشنی میں گرڈ1 میں 1, 2, 3 لکھیں)

Q3. Now I would like to know more about your company. What is the total no. of years since you have been in operation? سوال نمبر 3: اب میں آپ کی کمپنی کے بارے میں چند سوالات کرنا چاہوں گا یہ جاننے کے لیئے کہ آپ کی کمپنی کس نو عیت کی ہے۔سب سے پہلے یہ بتائیے کہ آپ کی کمپنی کتنے سال پر انی ہے؟

Q2. Thank you for your views. Now I would like to show you a list of probable challenges with the request to identify the top 3 most serious challenges by giving them numbers 1, 2, 3, with 1 being the most serious challenge, 2 being the 2nd most, and 3 being the 3rd most serious challenge.

_____ years

Q4. Do you provide services to the Domestic market, International market, or both?

،یا دونوں میں؟	ٹ میں	سوال نمبر4: کیا آپ لوکل یعنی پاکستانی مارکیٹ میں ہی سروسز مہیّاکرتے ہیں یا انٹرنیشنل مارکی
Domestic market	1	(ask Q4a.i.)
International market	2	(ask_Q4b.)

Q4a.i. In Domestic market, do you provide services mainly to Public sector or Private sector or both?

Private Sectorکو یا دونوں کو؟	آپ لوکل مارکیٹ میں صرف Public Sectorکو servicesمہیّا کرتے ہیں یا	سوال نمبر.i. 4a:
Public Sector		

Private Sect	tor	

Q4a.ii. In Domestic market, you provide services to which specific sectors of economy? *(Show Card and encircle codes in Grid 2)*

سوال نمبر.i. 4a: آپ لوکل مارکیٹ میں کِن کِن خاص sectorsمیں اپنی سروسز مہیاً کرتے ہیں؟ (کارڈ دکھائیں اور گرڈ2 میںcodesکے گرد دائرے لگائیں)

Domestic Sectors	Code
Agriculture	1
Banking	2
Manufacturing	3
Textile	4
Chemicals and Pharmaceuticals	5
Automotive	6
Wholesale and Retail Trade	7
Insurance	8
Transportation (Railways, Airlines, etc.)	9
IT Industry	10
SME	11
Education	12
Service Sector	13
Telecommunication	14
FMCG	15
Power Generation	16
Media / Advertising	17
NGO/Social Services	18
Healthcare	19
Real Estate	20
Other:	
Other:	
Other:	

1

Griu S	
International Markets	Code
UK	1
USA	2
EU	3
SAARC	4
China	5
Japan	6
Far East	7
Middle East	8
India	9
Australia	10
Africa	11
Other:	12
Other:	13

Q4b. If International, which markets do you mainly provide your services to?

سوال نمبر 4b: آپ کِن کِن International Markets کو اپنی سروسز مہيّا کرتے ہيں؟ ج است

Q5. What are the specific business services your company is providing? Please identify separately the services that you provide in the domestic market and those you provide in the international market.

(Show Card, Read one by one and encircle the stated codes in Grid 4)

سوال نمبر 5: آپ کی کمپنی کون کونسی بزنس سروسز مہیا کرتی ہے؟براہِ مہربانی لوکل مارکیٹ اور انٹرنیشنل مارکیٹ میں مہیّا کی جانے والی سروسز علیحدہ علیحدہ بتائیں۔

گرد گرِڈ 4میں دائرے لگائیں)	ر بتائے گئے کوڈ کے	ڑھ کر سنائیں او	<mark>ر</mark> ایک ایک کر کے پڑ	(کارڈ دیکھائیں او
Grid 4				

Business Services	Local Market	International Market
Customized Software Development	1	1
Web Designing	2	2
Web Application Development	3	3
Mobile Application Development	4	4
B P O Services	5	5
Offshore Staffing	6	6
Enterprise Resource Planning (ERP)	7	7
IT Consultancy	8	8
Business Process Analysis	9	9
Data Management	10	10
Data Warehousing	11	11
Application Re-Engineering	12	12
System Integration	13	13
Internet Marketing	14	14
E-Commerce	15	15
Graphic Designing	16	16
IT Training	17	17
G.I.S System Development	18	18
SEO	19	19
Quality Assurance	20	20
Other:		
Other:		

Other:	

Part-II HR Needs

Q6. Now I would like to ask a few questions that will help us understand your HR needs better. What is the current total number of employees working in your organization? Please also tell us their breakup into Permanent and Project-based employees, along with their gender? Please include your self in the total count and exclude lower staff like peons etc.

سوال نمبر 6: اب میں آپ کی HR needsکو بہتر طور پر سمجھنے کیلئے چند سوالات کروں گا۔ آپ کی کمپنی میں کُل کتنے افراد کام کرتے ہیں؟براہِ مہربانی ان میں سے Permanent اور Project-based افراد کی تعداد علیحدہ علیحدہ بتائیے،اور ان میں سے مرد کتنے ہیں اور خواتین کتنی ہیں؟برائے مہربانی کُل تعداد بتاتے وقت خود کو شامل کرنا نہ بھولیئے اور lower staff مثلاً Poons وغیرہ کو اس میں شامل مت کریں۔

	Total		
Total No. of Employees (both permanent and part-time	e):		
Permanent Employees:		(Male)	(Female)
Project-based Employees:		(Male)	(Female)

- Q7. Can you please tell us the total number of employees, both Permanent & Project Based, that you had 3 years back? *(Interviewer should check from Q3. If the company is less than 3 years old, ask Q7 for that specific time period.)*
- Project اور Permanent اور Project اور Permanent اور Based میں انداز آکٹل کتنے افراد کام کرتے تھے۔ Permanent اور ملا کر بتائیں؟

____Nos.

	Categories	%	No.
1	Architect		
2	BPO: Customer Service professionals		
3	Business Analyst		
4	Business Development/Client Relationship Manager		
5	Database Administrator		
6	Finance		
7	Graphics Designer		
8	Helpdesk		
9	HR		
10	IT Management (CEO, CIO, CTO, VP)		
11	Programmer		
12	Project Manager		
13	Quality Assurance		
14	System Administrator		

⁽ انٹرویور Q3سے چیک کرے۔ اگر کمپنی 3سال سے کم پرانی ہو تو Q7 اس دورانیے یعنی Q3میں بتائے گئے دورانیے کیلئے پوچھے)

15	Team Lead		
16	Technical Writer		
		4000/	

100%

TICK IN GRID 5 THE CATEGORIES MENTIONED IN Q8 BEFORE ASKING Q9 TO 9C AND ASK Q9 TO 9C FOR THE MARKED CATEGORIES ONLY

Q9. What are the minimum years of education of your employees of various categories?

(Show Card and write code against each category under column for Q9 in Grid 5 below)

سوال نمبر 9: ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیےکہ اس categoryوالے افراد کی کم سے کم تعلیم کتنے سال تک کی ہے؟

(کارڈ دکھائیں اور نیچے دیئے گئےگرڈ5 میں Q9 والے کالم میں کوڈ لکھیں)

Show Card for Minimum Education	Code
Less than 10 years of education	1
10 years of education	2
12 years of education	3
14 years of education	4
16 years of education	5
More than 16 years of education	6

Q9a. What is the common educational discipline of your employees of various categories?

(Show Card and write code against each category under column for Q9a in Grid 5 below) سوال نمبرہ9: ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیےکہ اس categoryوالے افراد عمومی طور پر کس educational discipline تعلق رکھتے ہیں؟

(کارڈ دکھائیں اورنیچے دیئے گئے گرڈ5 میں Q9a والے کالم میں کوڈ لکھیں)

Show Card for Educational Discipline	Code
Arts	1
Science	2
Commerce/Business	3
Engineering	4
Management Science	5
Computer Science	6
Computer Engineering	7
Software Engineering	8
Any other:	

Q9b. And what are the additional certifications/expertise that your employees of various categories commonly have? Please also tell us how many of your current employees have each of these certifications? *(Show Card and enquire about the cat/type which should be written in the column below. Then write codes*

(Snow Card and enquire about the cat/ type which should be written in the column below. Then write code against each category under column for Q9b in Grid 5 below)

expertise جو الے سے علیحدہ علیکدہ بتائیے کہ اس category والے افراد عمومی طور پر کیا اضافی expertise (پر کیا اضافی expertise) میں نمبر expertise (پر کیا اضافی category) ور الے افراد عمومی طور پر کیا اضافی expertise) ور بعد میں الے اور الے افراد عمومی طور پر کیا اضافی expertise) ور الے اور الے افراد عمومی طور پر کیا اضافی expertise) ور الے اور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور پر کیا اضافی expertise) ور الے افراد عمومی طور الے اور الے افراد عمومی ور الے افراد ع

(کارڈ دکھائیں اورنیچے دیئے گئے گرڈ5 میں Q9bوالے کالم میں کوڈز لکھیں۔ Certificationکی Cat/Typeپوچھ کر نیچے دیئے گئے کالم میں نوٹ کریں)

Show Card for Certifications/Expertise	Cat/Type of Certification if applicable	Code	No. of Certified Employees
No additional certification/expertise		1	
Cisco		2	

Microsoft	3	
РНР	4	
.NET	5	
Oracle	6	
Mobile Application Development	7	
Linux	8	
PMP	9	
SCRUM	10	
Prince2	11	
Any other:		

Q9c.

And what is the average experience in years that your employees of various categories commonly have? (Show Card and write code against each category under column for Q9c in Grid 5 below) سوال نمبرعو: ہر category کے حوالے سے علیحدہ علیحدہ بتائیےکہ اس category والے افراد عموماً کتنے سال کا تجربہ رکھتے ہیں؟ (کارڈ دکھائیں اور نیچے دیئے گئےگرڈ5 میں Q9c والے کالم میں کوڈ لکھیں)

Show Card for Experience	Code
Fresh	1
Less than 2 years	2
2-4 years	3
4 – 6 years	4
6-8 years	5
More than 8 years	6

Grid 5

		Min years of education (Q9)	Educational discipline (Q9a)	Additional Certifications/ Expertise (Q9b)	Average Experience (years) (Q9c)
1	Architect				
2	BPO: Customer Service professionals				
3	Business Analyst				
4	Business Development/Client Relationship Manager				
5	Database Administrator				
6	Finance				
7	Graphics Designer				
8	Helpdesk				
9	HR				
10	IT Management (CEO, CIO, CTO, VP)				
11	Programmer				
12	Project Manager				
13	Quality Assurance				
14	System Administrator				
15	Team Lead				
16	Technical Writer				

TICK IN GRID 6 THE CATEGORIES MENTIONED IN Q8 BEFORE ASKING Q10 AND ASK Q10 FOR THE MARKED CATEGORIES ONLY

Q10. What is the average salary bracket that your employees of these categories fall into? (Show Card) (Interviewer to Ask for Each Category Separately) For your convenience, here are some salary brackets. (Show Card) Please match each category with a salary bracket.

سوال نمبر 10: ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیے کہ اس categoryمیں average salary دی گئی کن salary bracketsمیں آتی ہے؟(کارڈ دکھائیں)

(انٹرویور ہر category کیلئے باری باری علیحدہ پوچھے اور salary brackets والا show cardبھی دکھائے) *Grid 6*

	Categories	Salary Brackets (Code)
1	Architect	
2	BPO: Customer Service professionals	
3	Business Analyst	
4	Business Development/Client Relationship Manager	
5	Database Administrator	
6	Finance	
7	Graphics Designer	
8	Helpdesk	
9	HR	
10	IT Management (CEO, CIO, CTO, VP)	
11	Programmer	
12	Project Manager	
13	Quality Assurance	
14	System Administrator	
15	Team Lead	
16	Technical Writer	

Salary Brackets (Rs)	Codes
Up to 15,000	1
15,001 - 30,000	2
30,001 - 50,000	3
50,001 - 70,000	4
70,001 - 100,000	5
100,001 - 150,000	6
More than 150,000	7

TICK IN GRID 7 THE CATEGORIES MENTIONED IN Q8 BEFORE ASKING Q11 TO 11C AND ASK Q11 TO 11C FOR THE MARKED CATEGORIES ONLY

Q11. Looking at future, what should be the minimum years of education that you would need for your employees of various categories?

(Show Card and write code against each category under column for Q11 in Grid 7 below)

سوال نمبر11: مستقبل کو مذِ نظر رکھتے ہوئے کہ کم سے کم کتنی تعلیمی قابلیّت والے افراد کی آپؓ کو سب سے زیادہ ضرورت ہو گی؟ ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیے ؟

(کارڈ دکھائیں اور اورنیچے دیئے گئےگرٍڈ7 میں Q11 والے کالم میں کوڈ لکھیں)

Show Card for Minimum Education	Code
Less than 10 years of education	1
10 years of education	2
12 years of education	3
14 years of education	4
16 years of education	5
More than 16 years of education	6

Q11a. Looking at future, what should be the common educational discipline that you would need for your employees of various categories?

(Show Card and write code against each category under column for Q11a in Grid 7 below)

سوال نمبر 111: مستقبل کو مدِّ نظر رکھتے ہوئے بتائیے کہ کس educational disciplineوالے افراد کی آپ کو ضرورت ہو گی؟ ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیے؟

Q11b. Looking at future, what should be the additional certifications/expertise that you would need for your employees of various categories?

(Show Card and enquire about the cat/type which should be written in the column below. Then write codes

against each category under column for Q11b in Grid 7 below)

سوال نمبر111: مستقبل کو مدِّ نظر رکھتے ہوئے ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیےکہ اس categoryوالے افراد کے پاس عمومی طور پرکیا اضافیcertifications /expertiseہونی چاہئیں؟ (کارڈ دکھائیں اور اورنیچے دیئے گئےگرڈ7 میں Q11b والے کالم میں کوڈز لکھیں۔ Certificationکی Cat/Typeپوچھ کر نیچے دیئے گئے کالم میں نوٹ کریں)

Show Card for	Cat/Type of Certification	Codo
Certifications/Expertise	if applicable	Code

No additional certifications/expertise	1
Cisco	2
Microsoft	3
РНР	4
ASP.NET	5
Oracle	6
Mobile Application Development	7
Linux	8
PMP	9
SCRUM	10
Prince2	11
Any other:	

Q11c. Looking at future, what should be the average experience in years that your employees of various categories are desired to have?

(Show Card and write code against each category under column for Q11c in Grid 7 below)

سوال نمبر111: مستقبل کو مذِ نظر رکھتے ہوئے ہر categoryکے حوالے سے علیحدہ علیحدہ بتائیےکہ اس categoryوالے افرادکا عموماً کتنے سال کا تجربہ ہونا چاہئیے؟

َ صَحِبَہہ جَہتے۔ (کارڈ دکھائیں اور اورنیچے دیئے گئے گرڈ7میں Q11c والے کالم میں کوڈ لکھیں)

Show Card for Experience	Code
Fresh	1
Less than 2 years	2
2-4 years	3
4 – 6 years	4
6 – 8 years	5
More than 8 years	6

		Min years of education (Q11)	Educational discipline (Q11a)	Additional Certifications/ Expertise (Q11b)	Average Experience (years) (Q11c)
1	Architect				
2	BPO: Customer Service professionals				
3	Business Analyst				
4	Business Development/Client Relationship Manager				
5	Database Administrator				
6	Finance				
7	Graphics Designer				
8	Helpdesk				
9	HR				
10	IT Management (CEO, CIO, CTO, VP)				
11	Programmer				
12	Project Manager				
13	Quality Assurance				
14	System Administrator				
15	Team Lead				

Grid 7
			1
16	Technical Writer		

Part-III Business Parameters

Now I would like to get more details about your business. Please rest assured that the information you provide will be used only for better understanding the problems and issues faced by the IT & ITES sector. Your accurate information will go a long way in achieving this objective.

اب میں آپ کے بزنس کے حوالے سے کچھ تفصیل جاننا چاہوں گاجیسا کہ ICT Fundکے تعارفی لیٹر سے واضح ہےکہ آپ کی دی گئی تمام معلومات صرف IT اور ITES کمپنیوں کے مسائل کو بہتر طور پر سمجھنے کیلئے حاصل کی جا رہی ہیں۔آپ کی دی ہوئی صحیح صحیح معلومات اس سلسلے میں ICT Fund کے لئیے بہت مددگار ثابت ہوں گی۔

Q12. Looking at the past three years, have you seen your business grow or decline in the past three years? And approximately by what percentage?
 (Interviewer should check from Q3. If the company is less than 3 years old, ask Q12 for that specific time period.)

سوال نمبر 12: اگر آپ گزشتہ تین سالوں کو سامنے رکھیں، تو کیا اس عرصے میں آپ کا بزنس بڑھا ہے یا کم ہوا ہے؟اور کتنے فیصد بڑھا یا کم ہوا ہے ؟

(انٹرویور Q3 سے چیک کرے۔ اگر کمپنی 3سال سے کم پرانی ہو تو Q12 اس دورانیے یعنی Q3میں بتائے گئے دورانیے کیلئے پوچھے)

Business has grown in the past 3 year's	1	Percentage
Business has declined in the past 3 year's	2	

Q13. To substantiate your answer, please provide your approximate current annual business volume *(in Pak Rupees)* and approximate volume three years back? ("M" stands for Million) *(Interviewer should check from Q3. If the company is less than 3 years old, ask Q13 for that specific time period.)*

سوال نمبر 13: آپ کی رائے کو بہتر طور پر سمجھنے کے لیئے مجھے جاننا ہو گا کہ آپ کا موجودہ Annual Business Volume مندرجہ ذیل میں سے کس bracket میں ہے؟ (Show card) اور ثین سال پہلے کس bracket میں تھا؟

(انٹرویور Q3 سے چیک کرے۔ آگر کمپنی 3سال سے کم پرانی ہو تو Q13 اس دورانیے یعنی Q3 میں بتائے گئے دورانیے کیلئے پوچھے)

Approximate annual current business	
volume range:	
Less than Rs 1 M	1
Between Rs 1 M and 5 M	2
Between Rs 5 M and 10 M	3
Between Rs 10 M and 20 M	4
Between Rs 20 M and 50 M	5
More than Rs 50 M	6

Approximate annual business volume		
three year's back:		
Less than Rs 1 M	1	
Between Rs 1 M and 5 M	2	
Between Rs 5 M and 10 M	3	
Between Rs 10 M and 20 M	4	
Between Rs 20 M and 50 M	5	
More than Rs 50 M	6	

Q14. What is the proportion of your business volume between domestic and international markets?

سوال نمبر 14: آپ کے موجودہ بزنس volume کا کتنے فیصد domestic ہے اور کتنے فیصد international ہے؟

Domestic Market	:	0/_0	(Check Q4)
International Market	:	%	

Q15. Which market do you see growing more rapidly in future?

سوال نمبر 15: Domestic اور International مارکیٹ میں سے کس کو آپ مستقبل میں زیادہ تیزی سے بڑھتا ہوا دیکھتے ہیں؟ Domestic Market 1 International Market 2

(Interviewer please check from Q5 and circle the services mentioned in Q5 in the following Grid before asking Q16)

Q16. You mentioned that you provide various business services *(read services Circled in following Grid).* What proportion of your business volume is derived from each of these services? Please provide an estimated percentage.

(انٹرویور Q16 پوچھنے سے پہلے Q5 سے چیک کرے اور Q5 میں بتائی گئی تمام سروسز پر نیچے دیے گئے Grid میں Circle کرے)

Services میں Grid میں Grid میں Grid کی تھی ایک آپ (نیچے دیے گئے Grid میں Grid کی گئی Services کی گئی services کی گئی پڑھیں) سروسز مینا کرتے ہیں۔آپ کے موجودہ بزنس volume کا کتنے کتنے فیصد ان میں سے ہر ایک سے حاصل ہوتا

¢
 1 .110

Business Services	Circle Codes Ticked in Q.5	%Age Of Business Volume (should add to 100)
Customized Software Development	1	
Web Designing	2	
Web Application Development	3	
Mobile Application Development	4	
B P O Services	5	
Offshore Staffing	6	
Enterprise Resource Planning (ERP)	7	
IT Consultancy	8	
Business Process Analysis	9	
Data Management	10	
Data Warehousing	11	
Application Re-Engineering	12	
System Integration	13	
Internet Marketing	14	
E-Commerce	15	
Graphic Designing	16	
IT Training	17	
G.I.S System Development	18	
SEO	19	
Quality Assurance	20	
Other:		
Other:		
Other:		

(Interviewer please check from Q4b and circle the markets mentioned in Q4b in the following Grid before asking Q17)

Q17. You mentioned that you cater to the following International Markets *(read out markets circled in following grid)*. What proportion of your International business is derived from each of these markets?

(انٹرویورQ17پوچھنے سے پہلے Q4b سے چیک کرے اور Q4b میں بتائی گئی تمام markets پر نیچے دیے گئے Grid میں (انٹرویورQ17پوچھنے سے پہلے Q4b سے چیک کرے اور Q4b میں بتائی گئی تمام markets پر نیچے دیے گئے Grid میں سوال نمبر 17: آپ نے بتایا تھا کہ آپ مندرجہ ذیل international markets میں سروسز مہیّا کرتے ہیں(نیچے دیے گئے Grid میں سوال نمبر 17: آپ نے بتایا تھا کہ آپ مندرجہ ذیل international markets میں سروسز مہیّا کرتے ہیں(نیچے دیے گئے Grid میں Circle کی گئی Markets پڑ ھیں) آپ کے ٹوٹل انٹرنیشنل بزنس کا کتنے کتنے فیصد ان میں سے ہر مارکیٹ سے حاصل ہوتا

Q17a. Looking at future, which market do you see growing the fastest?

Single response only. Tick the box in the below grid against that market in column Q17a) (سوال نمبر 17a: مستقبل کو مدِّنظر رکھتے ہوئے بتائیے کہ کونسی ایک انٹرنیشنل مارکیٹ کو آپ سب سے زیادہ تیزی سے بڑھتا ہوا دیکھتے ہیں؟

International Markets	Circle Codes Ticked in Q.4b	%age of International Business from each (should add to 100)	Fastest growing (Q17a)
UK	1		1
USA	2		2
EU	3		3
SAARC	4		4
China	5		5
Japan	6		6
Far East	7		7
Middle East	8		8
India	9		9
Australia	10		10
Africa	11		11
Other:	12		12
Other:	13		13

صرف ایک جواب لیں۔ جواب نیچے دیے گئے Gridکے کالم Q17a میںTickکریں

(Interviewer please check from Q4a.ii and circle the sectors mentioned in Q4a.ii in the following Grid before asking Q18)

Q18. You mentioned that you cater to the following Domestic sectors as well *(read out sectors circled in following grid)*. What proportion of your Domestic business is derived from each of these sectors?

(انٹرویورQ18 پوچھنے سے پہلے Q4a.ii سے چیک کرے اور Q4a.ii میں بتائے گئے تمام sectors پر نیچے دیے گئے Grid میں

Circleکرے)

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سوال نمبر 18: آپ نے بتایا تھا کہ آپ مندرجہ ذیل domestic sectorsکو اپنی سروسز مہیّا کرتے ہیں. (نیچے دنے گئے Gridمیں
circle کئے گئے sectorsپڑ ہیں). آپ کے ٹوٹل domestic business کا کتنے کتنے فیصدان میں سے ہر sectorسے حاصل
ہوتا ہے؟
```

Q18a. Looking at future, which sector do you see growing the fastest? (Single response only. Tick the box in the below grid against that sector in column Q.18a)

سوال نمبر 18a: مستقبل کو مدِّنظر رکھتے ہوئے یہ بتائیے کہ کونسے ایک sectorکو آپ سب سےزیادہ تیزی سے بڑھتا ہوا دیکھتے ہیں؟ (صرف ایک جواب لیں۔ جواب نیچے دیے گئے Grid کے کالم Q18a میںTick کریں)

Sector	Circle Codes Ticked in Q.4a.ii	%age of Domestic Business from each (should add to 100)	Fastest growing (Q18a)
Agriculture	1		1
Banking	2		2
Manufacturing	3		3
Textile	4		4
Chemicals and Pharmaceuticals	5		5
Automotive	6		6
Wholesale and Retail Trade	7		7
Insurance	8		8
Transportation (Railways, Airlines, etc.)	9		9
IT Industry	10		10
SME	11		11
Education	12		12
Service Sector	13		13
Telecommunication	14		14
FMCG	15		15
Power Generation	16		16
Media / Advertising	17		17
NGO/Social Services	18		18
Healthcare	19		19
Real Estate	20		20
Other:			
Other:			
Other:			

Part-IV Challenges and Future Outlook

(Interviewer please Tick the top three challenges from Q2 in the following grid before asking Q19)

Q19. Now let's talk of future of IT & ITES business. In the beginning of this interview you had identified the key challenges faced by this industry *(read out the top 3 identified challenges from following grid)*. What is your suggestion for rectifying these challenges for future growth of this industry?

(انٹرویور Q19 پوچھنے سے پہلے Q2 میں بتائے گئے تین اہم Challenges نیچے دئے گئے Grid میں Grid کرے) سوال نمبر19: اب مجھے آپ سے پاکستان میں ITE & ITEs انڈسٹری کے future کے حوالے سے بات چیت کرنی ہے شروع میں آپ نے اس انڈسٹری کو درپیش چند مسائل کی نشاندہی کی تھی (Q2میں دیئے گئے تین سب سے اہم مسائل پڑھ کرسنائیں) ان مسائل

	Challenges	Tick Challenges Ranked Top 3 in Q2	Suggestions
1	Shortage of human resource		
2	Less than adequate quality of human resource		
3	Shortage of funds		
4	Lack of Govt. support		
5	Difficulty in market access		
6	Law & order situation		
7	Poor infrastructure facilities		
8	Load shedding		
9	Employee Turnover		

Q20. In your views what major steps should be taken to ensure a continued growth in the IT & ITES sectors in future? سوال نمبر 20: آپ کی رائے میں کون کونسے اقدامات اٹھانا ضروری ہیں تاکہ IT & ITES TES انڈسٹری متواتر growکرتی رہے؟ Q21. What do you think is the top most issue that is currently restricting the growth of the IT & ITES industry in Pakistan? سوال نمبر 21: آپ کے خیال میں وہ کونسا ایک مسئلہ ہے جو اس انڈسٹری کی growth میں آڑے آ رہا ہے؟

Q22. Do you think Capacity Building is an issue which needs to be addressed?

	ینا ضروری ہے؟	ایک ایسا issue ہے جسے فوری طور پر حل کر	مبر 22: کیا آپ کے خیال میں capacity building	سوال ن
Yes	1	No 2	Don't know 99	

Q23. *(Show Card)* Which IT & ITES product/service in future will be the top most revenue generating engine of this industry? *(Single Response)*

سوال نمبر 23: **(کارڈ دیکھائیں)**آپ کے خیال میں کونسی ایکproduct /serviceمستقبل میں اس انڈسٹری کو سب سے زیادہ revenue مہیّا کر ے گی؟

Business Services	Top Revenue Generating in Future
Customized Software Development	1
Web Designing	2
Web Application Development	3
Mobile Application Development	4
B P O Services	5
Offshore Staffing	6
Enterprise Resource Planning (ERP)	7
IT Consultancy	8
Business Process Analysis	9
Data Management	10
Data Warehousing	11
Application Re-Engineering	12
System Integration	13
Internet Marketing	14
E-Commerce	15
Graphic Designing	16
IT Training	17
G.I.S System Development	18
SEO	19
Quality Assurance	20
Other:	
Other:	
Other:	

(صرف ایک جواب لیں)

Q24. In your view, how many companies like yours are there in this city and how many do you think are there in the whole country?

سوال نمبر 24: آپ کے خیال میں آپ سے ملتی جلتی کتنی اور کمپنیاں آپ کے اس شہر میں ہوں گی اور کتنی کمپنیاں سارے پاکستان میں ہوں گی؟ اندازے سے بتائیں۔

In this city: _____ Nos.

In Pakistan: _____ Nos.

Annexure IV: Average Revenue from Services

		Percentage of Companies in Sample																			
Revenue Bands	Band Mid-points	Customised Software Development	Web Designing	Web Application Development	Mobile Application Development	BPO Services	Offshore Staffing	ERP	IT Consultancy	Business Process Analysis	Data Management	Data Mining	Application Re-Engineering	System Integration	Internet Marketing	E-Commerce	Graphics Designing	IT Training	GIS System Development	SEO	Software Testing
1% - 10%	5%	7%	%6	8%	8%	4%	3%	8%	12%	7%	11%	7%	%9	7%	11%	11%	13%	%6	3%	10%	11%
10% - 20%	15%	3%	5%	4%	3%	1%	1%	1%	3%	1%	3%	2%	1%	%0	1%	1%	2%	2%	%0	2%	1%
20% - 30%	25%	2%	3%	3%	2%	%0	%0	1%	3%	1%	1%	%0	1%	%0	1%	1%	%0	%0	%0	%0	%0
30% - 40%	35%	%0	1%	%0	%0	%0	%0	%0	1%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
40% - 50%	45%	1%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
50% - 60%	55%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
60% - 70%	65%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
70% - 80%	75%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
80% - 90%	85%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
90% - 100%	95%	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0	%0
Only Provide this Service	100%	3%	%0	%0	%0	%0	%0	1%	2%	%0	1%	%0	%0	%0	1%	%0	%0	%0	%0	%0	%0
Average		29.7%	12.8%	11.7%	10.4%	7.0%	7.5%	16.4%	19.8%	8.3%	14.1%	7.2%	8.8%	5.0%	13.9%	7.3%	6.3%	6.8%	5%	6.7%	5.8%

Annexure V: Combined Illustration of Ranked Key Challenges



Most Serious Key Challenges: First, Second and Third Highest Ranking

Annexure VI: Average Salary within the Industry

Employee Category	Number in Sample Companies	Common Salary Bracket Midpoint	Aggregate Salaries
Architect	98	40,000	3,920,000
BPO: Customer Service professionals	85	22,500	1,912,500
Business Analyst	103	40,000	4,120,000
Business Development/Client Relationship Manager	182	22,500	4,095,000
Database Administrator	125	40,000	5000000
Graphics Designer	165	22,500	3712500
Helpdesk	101	22,500	2,272,500
HR	143	22,500	3,217,500
IT Management (CEO, CIO, CTO, VP)	223	60,000	13,380,000
Programmer	214	40,000	8,560,000
Project Manager	148	40,000	5,920,000
Quality Assurance	105	40,000	4,200,000
System Administrator	98	17,500	1,715,000
Team Lead	125	40,000	5,000,000
Technical Writer	58	22,500	1,305,000
TOTAL	1,973		68,330,000
Average Salary	68,3	PKR 34,633	

% of Revenue from Domestic Market % of Revenue from International Market Domestic International % of Companies **Revenue Share Revenue Share** 100% 25% 0.0% 25.0% 0% 5% 95% 0% 0.0% 0.0% 15% 85% 3% 0.5% 2.6% 1.3% 25% 75% 5% 3.8% 35% 65% 6% 2.1% 3.9% 45% 55% 5% 2.3% 2.8% 55% 45% 4% 2.2% 1.8% 65% 35% 6% 3.9% 2.1% 6.0% 75% 25% 8% 2.0% 3.4% 0.6% 85% 15% 4% 95% 5% 3% 2.9% 0.2% 30% 30.0% 0.0% 100% 0% **TOTAL** Percentage 100% 54.4% 44.6%

Annexure VII: Calculating Revenue Spread: Domestic Market and International Market

Annexure VIII: Calculating Average Revenue Growth

Prudent assumptions were made in order to calculate overall revenue growth within the industry:

- 1. Average midpoints of the growth / decline bands were used e.g. 35% for the band 30% to 40%.
- 2. As the midpoint for the last revenue growth band, i.e. 100% and above, cannot be ascertained, 100% growth was assumed for a prudent figure to be derived.
- 3. The final figure keeps in view the fact, revealed to us by the survey that 14% of the companies had declined in terms of revenue while 78% had seen growth.

No. of companies	Revenue Growth / Decline Bands	% Growth / Decline Band Midpoints
14	0% to 10%	5%
42	10% to 20%	15%
68	20% to 30%	25%
31	30% to 40%	35%
12	40% to 50%	45%
24	50% to 60%	55%
7	60% to 70%	65%
7	70% to 80%	75%
5	80% to 90%	85%
2	90% to 100%	95%
28	100% and above	100%
0	0% to 10%	(5%)
10	10% to 20%	(15%)
10	20% to 30%	(25%)
8	30% to 40%	(35%)
3	40% to 50%	(45%)
3	50% to 60%	(55%)
2	60% to 70%	(65%)
2	70% to 80%	(75%)
2	80% to 90%	(85%)
1	90% to 100%	(95%)
0	100% and above	(100%)
	Average Growth	29.2%

Annexure IX: Growth in the Number of Companies

Total Number of Companies in Sample	300
Number of Companies in Operation for Less than 3 Years	57
Number of Companies in Sample that Existed 3 Years ago	243
Growth Over 3 Years [57 / 243]	23.45%

Annexure X: Average Revenue per Company

Assumptions:

- Midpoints of the revenue bands were used e.g. PKR 2,500,000 for band "PKR 1,000,000 to PKR 5,000,000".
 As the midpoint for the last revenue band, i.e. PKR 50,000,000 and above, cannot be ascertained, PKR 50,000,000 revenue was assumed for a prudent figure to be derived.

Number of Companies	Revenue Band (PKR)	Revenue Band Midpoint (PKR)
39	Less than 1,000,000	500,000
92	1,000,000 to 5,000,000	2,500,000
43	5,000,000 to 10,000,000	7,500,000
41	10,000,000 to 20,000,000	1,500,000
14	20,000,000 to 50,000,000	2,500,000
13	More than 50,000,000	50,000,000
A	verage Revenue	PKR 5,366,541

Any and all queries with regard to the report and its findings are to be directed to consulting@ahln.com.pk with the following subject line: Query - Pakistan IT & ITES Industry Survey 2014

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