

An Evaluative Study to Explore Multiple Intentions Causes & Factors Behind Software Piracy Trends in Pakistan & Their Possible Solutions

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Abstract— Globally, the trend of software piracy is considered an unwarranted use or copying of unlicensed computer software but still it seems to be very importunate, unremitting and recurrent phenomenon for every computer user society. For third world countries or developing nations like Pakistan, where IT industry is already suffering due to other concerns, this supplementary concern of software piracy is getting issue of more apprehension and distress day by day. That is why this evaluative research study aims to explore multiple intentions causes and factors behind of SPTP (Software Piracy Trends in Pakistan). This research is based over positivistic research approach where, researcher cannot incorporate his personal interest. For carrying a proper research strategy both exploratory and descriptive research methods have been adopted. This research is focusing over quantitative mode of research. For quantitative mode of research, questionnaire has been formulated. The data collection phase for current research consisting of detailed profile of respondents, location of target sample and administration of data collection phase. Stratified random sampling technique has been used to extract the sample. The target population gets broken down into five strata and afterwards random sampling is done for each stratum. Each stratum includes 200 respondents from Punjab, Sindh, Baluchistan, Khyber Pakhtunkhwa, Gilgit & Biltistan. The sample sizes have been extracted from each stratum which remained at same proportion. So the sample size is almost same but randomly it is selected from each stratum of target population. It is matter of fact that when the population is located in far off places, having prominent groups of diversified nature and characteristics; it is recommended to divide it into different stratum. The sample size has been extracted from each stratum of target population which is comprises on 60 respondents. Total strata are five so, research sample has 300 respondents. Research data is analyzed in three units including tabulation of data, graphical representation and descriptive statistical analysis. The research study concludes that research respondents have mix type feedback about Software Piracy Trend in Pakistan with respect to explore multiple intentions causes and factors behind of SPTP. Some respondents believe that legal loops provoke software piracy trend and some other think that high prices (economical factors) are basic source of motivation to involve users in software piracy behavior among them. Behind users' scandalous intentions, the role of factors like rules and regulatory terms, technical flaws, poor IT infrastructure, competition among internet service providers is involve. The factors like less education, personal attitude, globalization and corruption play their due role for enhancing software piracy trend in Pakistan. Among five different types of factors including the highest contributing factor is legal and the lowest contributing factor is Social & cultural. Finally this research study recommends some possible solutions to reduce or minimize bad effects of software piracy in Pakistan that includes combined efforts of consumers, software producers and government, educational awareness programs and consumer awareness campaigns, implementing Software DRM (Digital Rights Management) strategies, etc. Usability analysis of solutions has been described in terms of mean, median, mode and range. This research study recommends that researchers can work at provincial level by adding more variables for their future research other than LTREASC intentions, causes & factors behind software piracy in Pakistan. They can also work on neighboring countries of Pakistan in order to make a better and comparative analysis of various intentions, causes & factors behind software piracy in Pakistan.

Index Terms— Causes & Factors, , Intentions, IT Industry , LTREASC, SPTP, Unwarranted, Unlicensed

1 INTRODUCTION

Software piracy is an unwarranted use or copying of unlicensed computer software so it seems to be very persistent, relentless and continual phenomenon around the world. For third world countries or developing nations like Pakistan, where IT industry is already suffering due to other concerns, the additional concern of software piracy adds fuel to the fire. Since last two decades, the highest average rate of software piracy in Pakistan was 85% according to Business Software Alliance (BSA) surveys 1996-2015 [1]. Therefore it is need of time to assess basic factors behind this ever-increasing rate of software piracy in Pakistan. That is why this evaluative research study aims to explore multiple intentions causes and factors behind of SPTP.

2 BACKGROUND & LITERATURE REVIEW

As information technology (IT) sector is getting more proficient day by day due to vigorous, rapid and efficient expansion so many software companies has come into this field with their news idea, innovative dimensions and inventive grounds. Due to such competition, the trend of software piracy is also getting a matter of concern for these companies. By concept, the software piracy is an illegal activity of copying, distribution, or use of software. It seems very attractive as it is victimless crime so it becomes very profitable "business" these days is being run by well-organized crime groups, spread almost in every country of the world. At one end, it causes significant and considerable lost revenue for software producers but on the other end, it is a "heaven prize" for cus-

tomers/users who normally cannot afford to purchase these software's actually these software are sold at high prices for the consumer and end users [2]. Regarding software piracy, multiple efforts have been done to reduce its adverse effects at software development industry but due to large volume of the Internet and communication technologies in the last few years, it seems very hard nut to crack. While living in global village, the advancement of infrastructure involves high density for sharing of various kinds of digital products (computer programs, songs and movies) in an easy way. As the result, intellectual property in form of software is very vulnerable now. Now copyright violation and software piracy are even not considered "crime", it is becoming now "easy way" to get required software without purchasing. As the software piracy is an act of unwarranted copying or reproduction of registered software so it is not merely limited to copying of the software but it is also practiced with transferring, sharing, reselling and installing several copies of pirated software onto their own computers for domestic and professional use. Various reasons have been found behind this act of unwarranted copying, reproduction and reselling of registered software.

2.1 Software Piracy Caused by Economical Factors

Some researchers identified economical factors behind software piracy, they considered an economic factor can affect level of software piracy so there must be particular organization policy to settle it [3]. However regarding online software distribution, one research findings suggest application of game theory to consider software organizations' protection policies [4]. Nunes et al. found that users or buyers of software always willing to pay full for information products that got high and fixed cost [5]. Even in some cases age, sex, honesty and ethical biasness for purchasing software. So behind piracy attitude, only economical factor is not involves [6]. By use of predictive model of software piracy attitude, it is also found that utility theory and deterrence theory also the affect piracy behavior [7], whereas cultural model or factors can affect software piracy intention and piracy behavior [8]. As economical factors, some researchers believe that effect of GDP (Gross Domestic Product), investment rates, income inequality, expenses of transferring of products and services, technology transferring expected profit, state tax burden inflation rate and IT expenditure are main factors behind software piracy [9] [10] [11][12] [13] [14].

2.2 Software Piracy; Cultural Factors

Regarding cultural motive behind software piracy, researchers found that ethics and personal attitude, individual creative development, individual ownership and tendency of improvement of the society are main factors. However these factors are reflected by various variables behind individualism/collectivism of various cultures. [15][16][17][18][19] [20][21][22][23][24].

2.3 Software Piracy; Socio-Political Factors

Regarding Socio-political factors, the software piracy motives are related to level of education, openness, globalization, democracy, corruption, political right, country openness index, democracy index, civil liberties and Freedom of expression.

However Marron et al. [25] identify that education affect the rate of piracy rate when considered for economic, cultural and institutional factors [10], whereas Depken et al. have not described any relationship between education and rate of piracy [5]. Even Ginarte et al. [6] and Yang et al. [26] found same outcome but according to Ginarte et al. [6] this kind of relationship exist strongly, but they considered only poor countries not for all [27][28].

2.4 Software Piracy; Technological Factors

Regarding technological factors behind Software piracy, according to Bezman et al. there are causes like IT infrastructure, dispersion of online services, number of Internet vendors, TVs, telephones, Computers and users of internet for each 1,000 persons. Moreover all such variables related to other Computers and online users in a state that means there is less likely unlicensed software will be used due to the much availability of network and range [28]. Even in case of computer and TV penetration or number of Internet users are concerns, the outcome is very different. In some cases piracy is being done at high rate and some case it is very low[29][30], however with use of high rate of multimedia, entertainment and high density of software industry are the motives which positively influenced the motion picture piracy rate [32].

2.5 Software Piracy; Global Scenario

Software piracy is a global issue, but there are some factors which influence, due to which, the rate of piracy differs from country to country. Increasing use of unlicensed software's is big problem for software companies facing today. This does not only affect software Companies but also for content owners has caused a lot of panic. Development Technological tools such as computers, software make our lives easier, but the abuse of this tool as software piracy has created a serious problem for IT industry advancement. Software piracy is a serious crime due to which intellectual properties are insecure [33]. In recent twenty years, the world has accomplished much advancement very frequently in different areas of information technology [34][35]. Due to this frequent & fast development, software companies' are in progress. To compete in the business & IT industry, companies have developed a large number of software, and they are easily available through the internet and other sources due to which criminal activities like software piracy also has been started. Ishwor Khadka have discussed five different forms of software piracy that includes Hard disk loading when a computer is purchased, 'Soft lifting' (end user piracy), Software counterfeiting (Reseller piracy), Downloading of copyrighted software via electronic bulletin boards (internet piracy) and Software rental [35]. Software organizations are struggling against piracy for many years. Technological advancement in the area of IT helps anybody to duplicate and circulate registered works anywhere and anytime. This same technology has led to large-scale commercial copyright infringement an important form of theft and fraud. In the last two decades, the software piracy trend becomes a serious issue for the software vendors due to which their investments & businesses are at the stake throughout the world and same in Pakistan. According to Institute of Electrical and

Electronics Engineers (IEEE), "the concept of a failure is defined as "deviation of the delivered service from compliance with the specification". Musa Karakaya et al.[34] have defined the nine factors which are behind the software piracy including public awareness, high software prices, risk of penalties, moral factors, opportunity, social factors, previous behavior, gender, author remoteness. Kallol Bagchi et al. and Zlatko J. have defined five different factors due to piracy differs in different countries. These factors are Economic, Technical, Regulatory, Social/Cultural and Legal Factors [27][36]. Andrea Stropková described effects of piracy at three levels that include National, organizational and individual levels [37].

2.6 Software Piracy; Pakistan's Scenario

The higher rate of software piracy is affecting the software organizations as it reduces the sales and profit of the licensed software and also the opportunity for the advancement of the new versions of software. Number of software organizations and government agencies are working to reduce the rate of piracy, but the effect is not yet encouraging. In Pakistan, up till now, there is no legislation has been made to stop the use of pirated software to save the intellectual property and to avoid financial loss. In Pakistan like other areas IT industry is also facing many challenges. One of them, the most important and burning issue is the highest rate of software piracy in Pakistan. According to Business Software Alliance (BSA) surveys 1996-2015 average rate of piracy in Pakistan was 85% [1]. Software piracy is the violation of copyright laws. There is no study specifically designed to know the causes in the Pakistan. One of the main reasons of software failure in Pakistan is software piracy [33]. Pakistan Telecommunication Corporation (PTC) identified the risk of using unauthorized software's in the article "Reporting suspected piracy of PTC software". It is available on the internet that unauthorized software may contain malware (viruses, adware, spyware), may not work properly or fail entirely, violation of the law may result in heavy fines and/or criminal penalties, may result in damage to reputation, negative publicity and lost business [38].

3 RESEARCH METHODOLOGY

3.1 Problems with the existing approaches

There are many reasons behind software piracy due to different forms of software piracy actions like misuse of software or software piracy can be done while hard disk loading when a computer is purchased, 'soft lifting' (end user piracy), software counterfeiting (reseller piracy), downloading of copyrighted software via electronic bulletin boards (internet piracy) and software rental. Moreover causes behind software piracy and unauthorized copying can be involved some personal motives which are different person to person, or business to business. However, Teoh Wei Quan, et. al [39] believed that it is involvement of factors like poor intellectual property rights enforcement, uniform pricing regardless of location, expanded global internet access, that are causes of high rate of software piracy [39]. By having same problem statement but different approach, Glass et al. found very interesting results. They

have identified the effects of specific factors on the intentions of personal participation in software piracy using equity theory. On the basis of this study they concluded that their study using this approach is more beneficial as compared to the study based on ethical decision [40]. Another approach adopted by Gupta et al. and described that ethics as a aspect is fixed in a set of factors (attitudes, legal aspects, social support, perception of economic loss and age) that affect software piracy [41]. While adopting target group approach, some researchers described that students of colleges and universities are the most frequently used as a target population for software piracy studies [42][43].

3.2 Scope of research

The significance of this research is obvious due to multiple dimensions covered in this research. It is matter of fact that in Pakistani software sector, the average highest rate of software piracy is about 85% since two decades according to Business Software Alliance (BSA) surveys 1996-2015 [1]. So the aspects covered in this research is very significant for policy makers who really want to find out main causes that promote software piracy's highest rate in Pakistan. As software piracy tends to endorse unsafe properties of intellectuals. This study gives a food of thought to investors either local or foreigners to take serious note about their investment in Pakistan software industry. This research study gives a comprehensive piece of information to the workers in software industry, top-class management, as it highlights LTREASC intentions, causes & factors behind software piracy in Pakistan. Although at small scale, this study covers some aspects of prevailing investment trends in software development, measures to save the Intellectual property, ways to grow-up foreign investment in local IT companies and features of public awareness about software piracy. But by covering LTREASC intentions, causes & factors behind software piracy in Pakistan, this study makes a way to encourage and support innovation by discouraging trend of using pirated software in Pakistan.

3.3 Objectives

The rationale of the study and problem statement leads to formulated current study aims:

- To find out legal intentions, causes & factors
- To search technical intentions, causes & factors
- To check regulatory intentions, causes & factors
- To explore economic intentions, causes & factors
- To discover social/cultural intentions, causes & factors
- To know Major effects of software piracy over software industry and software users in Pakistan.
- To recommend Possible solutions to reduce bad effects of software piracy in Pakistan

3.4 Research Questions

The research queries and questions, based over research objectives of this study are as following:

- What are legal intentions causes & factors?
- What are technical intentions causes & factors?
- What are regulatory intentions causes & factors?

- What are economic intentions causes & factors?
- What are social/cultural intentions causes & factors?
- What are major effects of software piracy over software industry and software users in Pakistan?
- What are possible solutions to reduce or minimize bad effects of software piracy in Pakistan?

3.5 Research Hypothesis

Based over problem statement and research objectives, the hypotheses formulated for current research study are as following

Null hypotheses	Alternative hypotheses
H0: There is no significant relationship of ill-legal intentions over software piracy in Pakistan.	H1: There is a significant relationship of ill-legal intentions over software piracy in Pakistan.
H0: There is no significant relationship of non-technical intentions over software piracy in Pakistan	H2: There is a significant relationship of non-technical intentions over software piracy in Pakistan
H0: There is no significant relationship of non-regulatory intentions over software piracy in Pakistan.	H3: There is a significant relationship of non-regulatory intentions over software piracy in Pakistan.
H0: There is no significant relationship of non-economic intentions over software piracy in Pakistan.	H4: There is a significant relationship of non-economic intentions over software piracy in Pakistan.
H0: There is no significant relationship of non-social/non-cultural intentions over software piracy in Pakistan.	H5: There is a significant relationship of non-social/non-cultural intentions over software piracy in Pakistan.

Table 3.1 Research Hypotheses

3.6 Research Design

For this research study, a master plan that can specify all research procedures is needed. So for carrying a proper research strategy both exploratory research and descriptive research methods have been adopted. It is matter of fact that both descriptive and exploratory research methods are equally important as descriptive research deals with question like who is doing?, what at?, where? and when? and how much?. However, exploratory research method focuses over actual "why" and "how". In current study the actual "how" is needed to be focused, it means how LTREASC intentions causes & factors affect software piracy in Pakistan. So for major concerns and findings in exploratory research method is being done to adopt where as for some minor but important issues like who (internet users) and how much (software piracy) comes under descriptive research methods. According to Kumar descriptive research systematically describes a situation, problem or phenomenon with purpose of describing what is prevalent in relation to problem which is being studied. Descriptive research study forms viewpoint of its objectives, and its design helps to give better understanding of problem that is being investigated. It also helps that what is prevalent regarding to consum-

ers. He believes that aim of descriptive research is to describe or define, what is prevalent regards to group of the people, team or community, logics and the situation or its outcome. He also believes that these theories can be categories which has been described above, and also suggests that an integration of the descriptive and explanatory research can be utilized in writing report research [44]. This research is focusing over a quantitative mode of research that mainly uses questionnaire as basic tool for data collection. It is good and appropriate technique for getting respondents' insights. After getting these insights, the framework and recommendations have been established. Meanwhile secondary data has been analyzed by using the critical review and framework development techniques. Only reliable resources for the secondary data have been considered. In addition, the interpretation of the data has been done by using Cronbach's coefficient or "alpha" statistic, widely acceptable reliability measurement for statistic for multi-item scales. Primary data has been gathered by survey of the research participants. Special efforts have been made for the true interpretation of the data by ensuring data analysis that does not show any biasness and predefined results. This descriptive based research design is very supportive in collecting empirical investigation of the phenomenon using scientific method. As this study needs to gather data numerically to see the gap between the current alarming situation of software piracy in Pakistan and main LTREASC intentions causes & factors affect software piracy in Pakistan. The current situation can be easily addressed by using this design as these highly concerned groups of research respondents have given their opinions about their due role and active participation in finding causes behind software piracy in Pakistan. An inference which has been drawn after statistical analysis by applying formulas through any suitable software, so by this descriptive and quantitative based research design gets more feasible for attainment of objectives related to target population scattered throughout all over provinces of Pakistan. Descriptive data analysis means describes data statistically whereas; exploratory data analysis typically involves fitting models to see whether "anything is there". One will usually first perform descriptive statistics, and then either exploratory data analysis or standard hypothesis tests if we already have hypotheses.

3.7 Research Population

The target population is those people who are part of software industry or having IT background from all over the Pakistan. This target population has been divided into five stratum. Each stratum includes 200 participants from Punjab, Sindh, Baluchistan, Khyber Pakhtunkhwa, AJK/Gilgit & Biltistan.

3.8 Research Sample

In a survey, a sample size is 60. Who are IT industry personnel's or the people have IT background has been extracted from each stratum of target population

3.9 Research Sampling Technique

For current research, the technique of sampling has been used is stratified sampling. In such sampling, the target population

gets broken down into categories and afterwards random sampling is done for each stratum. Mostly proportions of the sample sizes extracted from each stratum remained at same proportion so for current study the sample size is almost same but randomly selected from each category/stratum of target population. It is matter of fact that when the population is located in far off places, having prominent groups of diversified nature and characteristics; it is recommended to divide it into different stratum. In Stratified sampling the overlapping groups are divided into sub-population called strata. If the sample in each stratum is a simple random sample, the whole procedure is described as stratified random sampling [45]. The main reason behind using the stratified sampling for current research design is to give a uniform and identified stratum extracted from target population. Moreover this sampling technique helps to yield out more accurate results than simple random sampling. Additionally it also helped to show different tendencies within various categories of same target population [45].

3.8 Research Data Sources

It is matter of fact that both primary and secondary data is equally important for current research study.

3.8.1 Primary Data Sources:

Datasets for current research study are collected from the following research participants:

- 217 datasets are collected from the personnel’s working in different software organizations as a software developers, web designers, programmers, network administrators etc from each stratum.
- 54 datasets are collected from research scholars, Ph. D & MS Scholars of CS/IT department.
- 29 data sets are collected from college & university students of Masters level & BS(Hon) having CS/IT discipline.

3.8.2 Secondary Data Sources:

For the literature review, conceptual frame work and Operationalization of variables, the main secondary sources are included as following

- Historical reviews
- Annual reviews & reports
- Articles of the eminent scholars
- Reviewed Publications
- Research articles in educational Journals
- Official documents, policy statements

4 DATA ANALYSIS

4.1 Analysis of data

Here are implementation details with the help of data analysis of collected data.

4.1.1 Reliability of Data Tool

As Reliability estimates and evaluates overall stability of measures, internal consistency of measurement instruments,

and inter-rater reliability of instrument scores. So that is why reliability of data tool has been applied for questionnaire formulated for current research study.

For checking internal consistency of data instrument, it is needed to check degree to which all items/ questions in a scale are hang-together. It can be done by Cronbach’s coefficient or “alpha” statistic, widely acceptable reliability measurement for statistic for multi-item scales. It works as following

- Total scale variance = sum of item variances and all item covariances
- $[k/(k-1)] * [1-(\text{sum of item variances}/\text{total scale variance})]$
- Where k = number of items
- Range between 0 and 1
- Criteria for assessment

0.90 or > = high reliability

0.80-0.89 = good reliability

0.70-0.79 = acceptable reliability

0.65-0.69 = marginal reliability

The internal consistency of questionnaire formulated for current research study is given in table 4.1, which is 0.916. However, reliability scale for each item of questionnaire has shown in table 4.2.

Cronbach's Alpha	No of Items
.916	30

Table 4.1: Reliability Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Total Correlation	Cronbach's Alpha if Item Deleted
Province of Pakistan	68.96	368.222	.073	.916
Gender	70.51	375.716	-.098	.912
Age	68.81	374.571	-.027	.915
Level of Education	68.70	378.070	-.112	.916
Occupation/Job/Nature of work	68.89	370.604	.104	.912
I think the legal factor behind software piracy in Pakistan is copyright protection system,	69.55	349.673	.529	.907
I think the legal factor behind software piracy in Pakistan is membership rules & regulations	69.25	346.785	.628	.906
I think the legal factor behind software piracy in Pakistan is strict trade regulation rules & regulations	69.44	347.792	.555	.907
I think the legal factor behind software piracy in Pakistan is poor commitment to protection of IPRs,	69.72	353.100	.395	.909
I think the technical factor behind software piracy in Pakistan is poor IT infrastructure	68.98	345.802	.610	.906

I think the technical factor behind software piracy in Pakistan is competition among Internet service providers,	69.45	348.388	.666	.905
I think the technical factor behind software piracy in Pakistan is more internet users per 1,000 persons.	69.21	345.446	.672	.905
I think the technical factor behind software piracy in Pakistan is high density of multimedia pirated software users	69.60	351.271	.551	.907
I think the technical factor behind software piracy in Pakistan is high density of entertainment pirated software users	69.16	345.977	.560	.906
I think the regulatory factor behind software piracy in Pakistan is trend towards individualism	69.32	343.034	.674	.905
I think the regulatory factor behind software piracy in Pakistan is trend towards collectivism	69.46	344.584	.725	.904
I think the regulatory factor behind software piracy in Pakistan is trend for ownership of software	69.58	349.254	.513	.907
I think the regulatory factor behind software piracy in Pakistan is trend for intellectual property rights,	69.10	343.183	.594	.906
I think the regulatory factor behind software piracy in Pakistan is trend for protection of software development	69.16	353.798	.396	.909
I think the economic factor behind software piracy in Pakistan is state tax burden	69.48	350.130	.497	.908
I think the economic factor behind software piracy in Pakistan is IT expenditure	69.32	342.715	.618	.905
I think the economic factor behind software piracy in Pakistan is domestic market size,	69.20	340.279	.657	.905
I think the economic factor behind software piracy in Pakistan is foreign direct investments	69.05	342.014	.589	.906
I think the economic factor behind software piracy in Pakistan is level of market/economic freedom	69.13	338.276	.696	.904
I think the social factor behind software piracy in Pakistan is less education	69.09	338.655	.634	.905
I think the social factor behind software piracy in Pakistan is personal attitude	69.19	341.385	.653	.905
I think the social factor behind software piracy in Pakistan is globalization,	69.23	341.841	.655	.905
I think the social factor behind software piracy in Pakistan is corruption	69.04	342.982	.594	.906

I think the social factor behind software piracy in Pakistan is civil liberties	68.94	345.682	.514	.907
I think the legal factor behind software piracy in Pakistan is international copyright convention	69.13	372.685	.005	.916

Table 4.2: Item-Total Statistics

4.2 Descriptive analysis of section 1

This section mainly aims to get general information of survey respondents. The detail of each question of this section one and its responses are as following

	Province of Pakistan /Area you live in	Gender	Age	Level of Education /Literacy	Occupation /Job/Nature of work
Valid N	300	300	300	300	300
Missing	0	0	0	0	0
Mean	2.69	1.13	2.84	2.94	2.75
Std. Error of Mean	.085	.020	.059	.062	.047
Median	3.00	1.00	3.00	3.00	3.00
Mode	1	1	3	3	3
Std. Deviation	1.480	.341	1.017	1.076	.818
Variance	2.189	.116	1.033	1.157	.670
Skewness	.265	2.168	.179	-.081	-.320
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	-1.345	2.719	-.296	-.591	-.333
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	1	4	4	3
Minimum	1	1	1	1	1
Maximum	5	2	5	5	4
Sum	806	340	851	883	825

Table 4.3: Descriptive analysis of section 1

Table 4.3 indicates that overall descriptive statistics of section one of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing general information of research participants. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, some values got negative sign while rest of values of data-set got negative sign. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution whereas the positive sign of Kurtosis indicates that the distribution has heavier tails and a high peak than the normal distribution.

4.3 Descriptive analysis of section 2

	I think the legal factor behind software piracy in Pakistan is copyright protection system,	I think the legal factor behind software piracy in Pakistan is international copyright convention	I think the legal factor behind software piracy in Pakistan is membership rules & regulations	I think the legal factor behind software piracy in Pakistan is strict trade regulation rules & regulations	I think the legal factor behind software piracy in Pakistan is poor commitment to protection of IPRs,
N	300	300	300	300	300
Valid	300	300	300	300	300
Missing	0	0	0	0	0
Mean	2.09	2.51	2.39	2.20	1.93
Std. Error of Mean	.068	.073	.065	.070	.076
Median	2.00	2.00	2.00	2.00	1.00
Mode	2	2	2	2	1
Std. Deviation	1.186	1.268	1.132	1.219	1.324
Variance	1.407	1.609	1.282	1.487	1.754
Skewness	1.181	.715	.790	1.109	1.362
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	.653	-.456	.126	.366	.516
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Sum	627	753	717	661	578

Table 4.4: Descriptive analysis of section 2

Table 4.4 indicates that overall descriptive statistics of section two of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing perceptions of research participants. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, some values got negative sign while rest of values of data set got negative sign. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution whereas the positive sign of Kurtosis indicates that the distribution has heavier tails and a high peak than the normal distribution.

4.4 Descriptive analysis of section 3

	I think the technical factor behind software piracy in Pakistan is poor IT infrastructure	I think the technical factor behind software piracy in Pakistan is competition among Internet service providers,	I think the technical factor behind software piracy in Pakistan is more internet users per 1,000 persons.	I think the technical factor behind software piracy in Pakistan is high density of multimedia pirated software users	I think the technical factor behind software piracy in Pakistan is high density of entertainment pirated software users
N	300	300	300	300	300
Valid	300	300	300	300	300
Missing	0	0	0	0	0
Mean	2.67	2.20	2.43	2.04	2.48
Std. Error of Mean	.069	.058	.064	.062	.075
Median	2.00	2.00	2.00	2.00	2.00
Mode	2	2	2	2	2
Std. Deviation	1.203	1.011	1.115	1.070	1.292
Variance	1.447	1.021	1.243	1.145	1.668
Skewness	.189	.967	.666	1.248	.663
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	-1.146	1.014	.076	1.237	-.638
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Sum	800	659	729	613	744

Table 4.5: Descriptive analysis of section 3

Table 4.5 indicates that overall descriptive statistics of section three of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing perceptions of research respondents. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, some values got negative sign while rest of values of data-set got negative sign. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution whereas the positive sign of Kurtosis indicates that the distribution has heavier tails and a high peak than the normal distribution.

4.5 Descriptive analysis of section 4

	I think the regulatory factor behind software piracy in Pakistan is trend towards individualism	I think the regulatory factor behind software piracy in Pakistan is trend towards collectivism	I think the regulatory factor behind software piracy in Pakistan is trend for ownership of software	I think the regulatory factor behind software piracy in Pakistan is trend for intellectual property rights,	I think the regulatory factor behind software piracy in Pakistan is trend for protection of software development
N Valid	300	300	300	300	300
N Missing	0	0	0	0	0
Mean	2.32	2.18	2.06	2.54	2.49
Std. Error of Mean	.070	.062	.072	.077	.074
Median	2.00	2.00	2.00	2.00	2.00
Mode	2	2	1	1	2
Std. Deviation	1.204	1.071	1.239	1.342	1.281
Variance	1.450	1.147	1.535	1.801	1.642
Skewness	.883	1.043	1.192	.399	.606
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	.093	.904	.499	-1.061	-.724
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Sum	697	655	618	762	746

Table 4.6: Descriptive analysis of section 3

Table 4.6 indicates that overall descriptive statistics of section four of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing perceptions of research respondents. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, some values got negative sign while rest of values of data set got negative sign. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution whereas the positive sign of Kurtosis indicates that the distribution has heavier tails and a high peak than the normal distribution.

4.6 Descriptive analysis of section 5

	I think the economic factor behind software piracy in Pakistan is state tax burden	I think the economic factor behind software piracy in Pakistan is IT expenditure	I think the economic factor behind software piracy in Pakistan is domestic market size,	I think the economic factor behind software piracy in Pakistan is foreign direct investments	I think the economic factor behind software piracy in Pakistan is level of market/economic freedom
N Valid	300	300	300	300	300
N Missing	0	0	0	0	0
Mean	2.16	2.32	2.45	2.59	2.51
Std. Error of Mean	.071	.076	.077	.081	.078
Median	2.00	2.00	2.00	2.00	2.00
Mode	2	1	1	1	1
Std. Deviation	1.230	1.315	1.339	1.403	1.345
Variance	1.513	1.730	1.793	1.968	1.809
Skewness	1.038	.653	.573	.429	.497
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	.118	-.762	-.861	-1.111	-.936
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Sum	648	696	734	778	753

Table 4.5: Descriptive analysis of section 3

Table 4.7 indicates that overall descriptive statistics of section five of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing perceptions of research participants. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, some values got negative sign while rest of values of data-set got negative sign. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution whereas the positive sign of Kurtosis indicates that the distribution has heavier tails and a high peak than the normal distribution.

4.7 Descriptive analysis of section 6

	I think the social/cultural factor behind software piracy in Pakistan is less education	I think the social/cultural factor behind software piracy in Pakistan is personal attitude	I think the social/cultural factor behind software piracy in Pakistan is globalization,	I think the social/cultural factor behind software piracy in Pakistan is corruption	I think the social/cultural factor behind software piracy in Pakistan is civil liberties
N Valid	300	300	300	300	300
Missing	0	0	0	0	0
Mean	2.56	2.45	2.42	2.60	2.70
Std. Error of Mean	.084	.075	.074	.078	.081
Median	2.00	2.00	2.00	2.00	3.00
Mode	1	1	2	1	1
Std. Deviation	1.447	1.304	1.281	1.351	1.405
Variance	2.094	1.700	1.642	1.825	1.975
Skewness	.426	.554	.595	.381	.190
Std. Error of Skewness	.141	.141	.141	.141	.141
Kurtosis	-1.215	-.805	-.733	-1.042	-1.302
Std. Error of Kurtosis	.281	.281	.281	.281	.281
Range	4	4	4	4	4
Minimum	1	1	1	1	1
Maximum	5	5	5	5	5
Sum	767	736	725	781	811

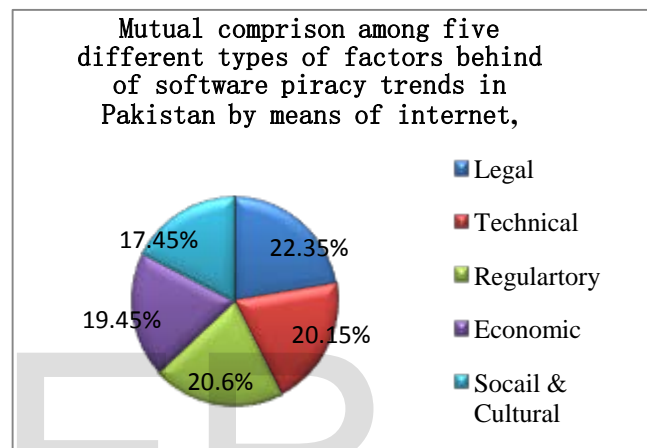
Table 4.8 indicates that overall descriptive statistics of section six of questionnaire formulated is to check critically main intentions, causes & factors behind software piracy in Pakistan, for knowing perceptions of research respondents. This table shows that due to difference of means, data of each variable show much variety of data. The skewness of this whole data set of this questionnaire got positive sign, which mean data set got tail on the right side so its probability and density function is smaller or less fatter than the left side of data. Regarding Kurtosis, all values got negative signs. Kurtosis shows, that how much the peak and tails of a distribution differ from the normal distribution of data, the negative sign of Kurtosis indicates that the distribution has lighter tails and a flatter peak than the normal distribution.

5 DISCUSSION ON RESULTS

5.1 Results

Overall this research study concludes that research participants belong to Punjab, Sindh, Baluchistan, Khyber Pakhtunkhwa and Gilgit & Baltistan have mix type feedback about Software Piracy Trend in Pakistan with respect to explore multiple intentions causes and factors behind of SPTP.

Some research participants believe that legal loops provoke to involve themselves in software piracy behavior among them. However, as significant number of research participants believe that high prices (economical factors) are basic source of motivation to involve them in software piracy behavior among them. However, few research participants believe that for their scandalous intentions, causes & factors behind of software piracy, the rules and regulatory factors are involved. Among five different types of factors including LTREASC intentions Causes & Factors behind of SPTP, the highest contributing factor is legal and the lowest contributing factor is Social & cultural however contribution of all factors are as following.



5.2 Hypotheses Results Summary

Through Pearson's correlation 'r' all the hypotheses formulated for current research have been tested. The variables which have been tested have 'r' value greater than 0, so the relationship present between them is positive linear. No single value of 'r' has negative linear relationship. On the basis of correlation 'r' all the null hypotheses for LTRESC intentions causes and factors have been rejected and alternative hypotheses have been accepted. Detail is as under:

Hypotheses No	Pearson's Correlation		Relationship	Null Hypothesis	Alternative Hypothesis
	Min	Max			
H1	.138	.856	Positive linear	Rejected	Accepted
H2	.427	.736	Positive linear	Rejected	Accepted
H3	.244	.742	Positive linear	Rejected	Accepted
H4	.292	.915	Positive linear	Rejected	Accepted
H5	.523	.954	Positive linear	Rejected	Accepted

Table 5.1 Hypotheses Summary

6 CONCLUSION

6.1: Recommendations

6.1.1 Possible Solutions to Reduce or Minimize the Bad Effects of Software Piracy in Pakistan

For discouraging software piracy, many research participants believe that community or users themselves can take an initiative to handle this issue moreover there are many things that individuals and businesses can do to help stop software piracy.

1. Halting piracy requires the combined efforts of consumers, software producers and government.
2. There is also need of enhancement of awareness level of end-user.
3. Most successful efforts, in this regard, can be involvement of educational programs coupled with enforcement.
4. Through extensive public relations campaign software producers can create awareness among their customers.
5. Educational awareness programs and consumer awareness campaigns would definitely help in creating cognizance of the specific actions that constitute software piracy as well as acts as deterrents.
6. There is need to create and develop moral sensitivity about increasing trend of software piracy in Pakistan.
7. Pakistani nation must understand its legal and social obligations
8. There is also need of giving awareness about terms and conditions of license agreement.
9. Software publishers need to take proactive and positive steps in the form of implementing Software DRM(Digital Rights Management) strategies to protect their products against illegal copying and IP theft.
10. To combat against the physical pirating and sale of unlicensed software the government should raids and the authenticate software as part of the means to obtain a business license.
11. Proper and in-time implementation of the laws are more important.
12. The government must continue to comply with international regulations that regulate software piracy.

6.2 Future Work

Although this research work is very beneficial for software firms who really want to know basic intentions, causes and factors behind software pricey in Pakistan. As the main research objective is to check critically main intentions, causes & factors behind software piracy in Pakistan in terms of LTREASC intentions , causes & factors behind software piracy in Pakistan, but still more work can be done in this regard. For the future work, students of computer science can work at provincial level in order to find intentions, causes and factors behind software pricey in Pakistan. They can also add more variables in their future research other than LTREASC intentions, causes & fac-

tors behind software piracy in Pakistan. Futher more this research is limited to only online users related to IT industry or having IT background from all over the Pakistan have been included as research population. This population has been selected because of easy accessibility of respondents and time conveniences of researcher as well. But For the future work, students of computer science can work over research participants of neighboring countries of Pakistan in order to make a better and comparative analysis of various intentions, causes & factors behind software piracy in Pakistan.

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