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Perception of Factors Affecting the Quality of Higher Education: A Study on Selected Private Universities in Bangladesh

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Abstract
Taking higher education in Bangladesh is not as difficult as it was thought a decade ago. No doubt, expansion of private universities has made it so easy. Through the Private University Act-1992, there has been an unbelievable expansion of private universities in Bangladesh. Nevertheless, this growth, in some respect, is contrasted with the quality of higher education these universities provide. The main purpose of this paper is to find out some factors that greatly affect the higher education. To explore the subject matter of this study, considering the research questions and objectives, both the qualitative and quantitative methods of data collection have been used. To find out the answers of the research questions survey has been conducted with 42 questions for students in 20 private universities in Dhaka, the capital of Bangladesh. After collecting data and information and analyzing, researchers have found that quality of education of all these universities is not same. It differs on the ground of their different size, location, stuffs, courses, funding authority, service rule, financial and managerial capacity etc. Only a few universities are providing quality education but rests of them are not quality concerned, Most of them are depending on part time teachers, poor infrastructures, without service rules etc. In the same time, researchers have found that students' satisfaction level is very low on campus, lab and library facilities, though a few universities are trying to ensure standard classroom facility and library facilities. Most of the students are not aware of their degrees and its sale-ability. At last, based on findings, researchers have offered some suggestions that can be taken into consideration in policy level.

Keywords: Private University, UGC, Quality Education, Bangladesh

1. Introduction

In early 1990s, private sector came forward to establish universities. Since then country experienced a spectacular growth in private universities– they were mostly in and around Dhaka. After deregulation program, private sectors' participation is increasing significantly in Bangladesh, especially in some area of service sectors. As a reform initiative of public sector management, government shifted its policy in early 1990s in higher education sector. This program makes a pressure to public universities and creates a competitive environment in country's higher education. Though 84 universities are (including National University and Open University) are providing higher education it is widely saying that the quality of higher education has declined steadily(UGC,2004). Public university is the best option to the students for higher education and then comes private university. With a few exceptions, public universities are failing to meet the market demand and suffering from low governance. Private university emerged as an alternative to cope up with the expanded demand of higher education. Only a few of them are maintaining standard but a huge allegation are being raised against the rests. It was hoped that Higher Education Quality (HEQ) would be ensured with the competition of both the sectors: Public and Private. However, it is commonly saying that the quality of higher education is declining rapidly. According to academicians, researchers, various committees (UGC led High Powered Committee, 2003) newspaper reports and public perception the quality of education of the private universities is deteriorating sharply.

UGC, the apex body for higher education in its report observed and expressed its concern about the quality of HE institutions. UGC(2007) identified that most of the universities have no quality teachers, fulltime faculties, updated curriculum, infrastructure facilities, libraries, teaching aids, etc. Poor governance, financial mismanagement, profit motive of the owners etc. seriously affect the governance and quality of the private higher educational institutions. Private universities are self financed and only to get approval of new curriculum, awarding degree and some other administrative matters they need to go to the UGC. But unfortunately UGC cannot take action against any allegation due to liberal Private University Act-1992.

It is very difficult to comment definitely on the quality of education in the private universities. There is no evaluation system for this. Of course, the public universities also do not have any system of quality monitoring. One advantage of the public universities is that they draw good quality students and also good quality teachers. They start with a better base; this may not be true for all the private universities of Bangladesh (Andaleeb, 2003).

Quality of education depends on a lot of issues. The broad areas are management, teaching quality, faculty resources,

quality intake, method of teaching, technology support, update curriculum, direct and indirect infrastructure etc. With all these, universities should have specific mission and vision to its goal. We have some successful stories in private universities in Bangladesh. Some are providing quality education and producing high quality graduates. On the other hand it is commonly saying that private universities are responsible for deteriorating the quality of higher education , even some institution are selling certificates. Quality teachers, teaching methods, physical facilities etc. are not at all in support for higher level. According to UGC report (2008), only a few universities have their own campus, but rests of them have been running in rented house in residential or industrial areas of the city. Even after 10 years of having approval they failed to establish permanent campus that was supposed to do within five years of approval. So, quality of the higher education and facilities are the major concerns for PUs in Bangladesh to ensure quality production.

2. Statement of the Problem

Private Universities are providing Higher Education. After 1990, there is a dramatic growth in the country's higher education. Instead of rapid expansion, the quality of education is declining. Private universities are profit-oriented and some allegations are there against them. Islam, Fakhrul (2006),according to newspaper report, they are selling certificates and thus responsible for declining education quality. But all universities are not equal in terms of providing inputs to produce output as productive and employable graduates. It is commonly saying that faculty selection is not based on merit and universities are depending on part-time teachers. On the other side, most of the universities are failing to provide infrastructure facilities like laboratory, classroom, library etc. Universities are running their activities in industrial or residential areas. In the same building, some floors are rented for university and others are for restaurant, beauty parlor, furniture shop and like. Computer Science and communications related subjects are common but there are no sufficient lab facility, networking, ICT infrastructure and library facilities (Rouf, Abdur,2006). To ensure the quality of a program these issues are related. So, quality of education cannot be ensured without quality teacher and other facilities.

3. Literature Review

In Bangladesh, only a few studies have been done to explore the education quality of private universities. Syed Saad Andaleeb (2003) conducted a study in 2003 used 9 factors model to explain the satisfaction of alumni with their education. These factors include quality of the teachers, method and content, peer quality, facilities and resources, the effectiveness of the administration, campus politics, gender and year of graduation. A study by Jamal (2002) explored the role of private universities in human resource development. The aim of the study is to analyze the effectiveness of private universities in promoting quality higher education in Bangladesh and their contribution to human resource development (HRD) in the country. He argued that despite many shortcomings, private universities provide a global flavor to their students. Some of their facilities are of a very high standard. In fact, taking advantages of shortcomings of the Private University Act (PAU) - 1992, many universities have been established that lack essential academic infrastructures. These universities are likely to bring bad name to others who are providing high quality education in the country. Finally he argued that though at a high cost, private universities in Bangladesh definitely have contribution in human resource development. Andrea Bonaccorsi et. al (2007) in the book "University: Strategic Knowledge Creation" identified variables in six broad areas to analyze the quality of higher education. Those areas are; general information on HEIs, revenues, expenditures, personnel, education production and research and technology production. International workshop on the development of measurement for the assurance of quality higher education in Bangladesh (2007) proposed indicators/measures to assess the quality of higher education in Bangladesh. In working paper-2, the workshop proposed some areas with specific parameters. Some of the areas are purpose and objective, faculty, instruction, student service, library, laboratories, infrastructure, research culture, etc. Islam, Zahidul. (2007) established performance evaluation indicators for higher education. The study concluded with 18 important evaluation items and 84 indicators through the Delphi Method. They divided the areas in input, process and output aspect. Every area has some factors or items those are explained by various indicators. According to Shun-Hsing Study factors are 1. Input aspect: Student quality, faculty resources, financial resources, teaching resources, student structure, and development target. 2. Process Aspect: Teaching quality, research results, curriculum planning, tutorship result, retention rate, and 3. Output Aspect: School reputation, financial donation, Strategic Planning for Higher Education in Bangladesh etc. This report pointed out that a large number of private universities are operating in make-shift arrangements in hired accommodation. They have failed to meet the minimum requirements of physical infrastructures, full time qualified faculties, teaching aids and other facilities that are essential for imparting proper education. According to the annual report of the UGC in 2008 students' intake should be merit-based, more transparent and legitimized. Moreover, report focused on the infrastructure and quality faculties. It says, more education facilities should be provided. UGC prescribed rules must be followed at the faculty selection. Masum (2008) in his book "Higher Education Governance in Bangladesh" focused that qualified full time faculty members must be recruited in the private universities, at least 80 percent faculty members should be full time. Ehsan expressed his concern, unless campus facilities are upgraded largely, we cannot expect vibrant academic atmosphere in the private universities. In his book he tried to explore the status of governance in Public and Private Universities in Bangladesh.

4. Scopes and Objectives of the Study

For sampling we selected 20 universities out of 54. Education quality depends on various issues. In this study we have taken only two variables i.e infrastructure and faculty resources as independent variable to explain the dependent variable on Quality of Education. Again infrastructure and faculty resources are also related to a lot of issues. We have taken existing faculties in various levels and categories, benefits they are enjoying, and research activities for analyzing faculty

resources. In infrastructure we have taken campus, classroom, library and laboratory facilities. For analyzing these issues we would use some indicators.

Objectives of this study have been divided into general and specific objective. The general objective of the study is to explore the education quality of Private Universities in Bangladesh.

The specific objectives are;

(a). To explore the infrastructure facilities those are provided by the Private Universities.

(b). To assess the quality of teachers of Private Universities.

5. Significance of the Problem/Study

Despite the rapid increase in the enrolment in higher education during the last decade the quality of education remains a serious cause of concern. UGC reports and assessments observed that both public and private universities suffer from quality problems (Aminuzzaman, 2008). Education, especially higher education, has an important role for the development of a country. The basic objectives of the universities are to provide education, conduct research and to create new knowledge. Andaleeb (2003) says that, higher education has its strategic importance not only as an engine for human resource development and as a facilitator of growth through forward and backward linkages but also serves as an incubator and repository of knowledge with untold potential. Today, it is under intense scrutiny in many countries of the world. Governmental and societal groups are taking a hard look, among other factors, at the performance of higher education institutions (HEIs) and the quality and value they deliver (Islam, 2007). With the exception of a few, Private Universities are blamed for deteriorating the quality of education. But, as of today, there is no accreditation body or any other mechanism to assess or to ensure the quality of higher education. The role of UGC is not so sharp due to legal and resource constraints. Ministry of Education is playing ultimate role to institutionalize quality control. Actually, the UGC and the GoB, of course, exercise little control over the quality of education in public universities (Alam et. al, 2002). So, we need formal mechanism to identify the reasons or factors behind the deterioration of quality education.

In this context, the study attempts to explore the quality of education of Private Sector Institutions. The study will explore its goal or assess the quality with some common indicators. This research will help to know the strengths and weaknesses of PUs and what are the causes behind the declining education quality. Every year huge number of students went abroad for higher education a decade ago. So that country lost brilliant youths and foreign currency as well. With the emergence of PUs this trend is negative now. If the PUs can maintain the quality of higher education, the country will be able to protect brilliant students from going abroad. As no significant study has done earlier in this field, this study will help to give at least some thoughts to formulate proper guidelines and policies related to faculty resources and infrastructure facilities.

Methodology and Research Findings

6. Research Methodology

In this study, infrastructure facilities and teacher's quality will be analyzed to explore the quality of education in Private Universities. To conduct the study 20 private universities have taken by using stratified sampling. The study has been conducted based on both primary and secondary data. Primary data has been collected through interviews and Questionnaire survey. Structured questionnaire containing both open and closed ended was used. A survey through a standardized questionnaire was conducted to collect both quantitative and qualitative information from the 136 respondents in private universities. A questionnaire has been used for collecting primary data. We interviewed students and faculty members.

Secondary data and information has been collected besides the primary sources. Secondary data has been taken from journal articles, published books, government documents, education commissions' report, policies, reports of various committees related to higher education etc. a combination of quantitative and qualitative methods have been used In this study. The question might arise why the researchers have used a combination of these methods. Because it is advantageous to a researcher to combine methods to better understand a concept being tested or explored. Each approach has its strengths and its weaknesses, and we think over reliance on a single method research it's not possible to get authenticity. Researchers think if they combine both quantitative and qualitative research, it would provide a general picture of their study areas.

Data, collected from the field, has been presented through descriptions and analysis. The responses of each item of close-ended type have been analyzed in terms of number (frequency) of responses. The frequencies further have been converted into percentages to describe the result of the item to arrive at the findings. The data collected by the respondents to each of the open-ended items has categorized based on their contents into different clusters along with their frequencies and percentages.

7. Data analysis and findings:

In terms of questions and objectives of the research, both the qualitative and quantitative methods of data collection have been used for this study. To find out the answers of the research questions survey has been conducted with a questionnaire containing 42 questions for students and faculty members. After collecting data and information and analyzing, it has been found that the quality education of all the private universities is not same. Universities are different in terms of course offering, funding authority, location, enrolment etc. These pictures are as follows:

Table-1

Classification of respondents, according to their opinion, about their admission into private universities

Type of answer	Respondents'	Percentage
Yes	43	31.61%
No	93	68.39%

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Total	136	100%

This table shows that total 43 respondents (31.61%) out of 136 have been influenced by others to admit into the private universities where as 93 respondents (68.39%) admitted by their own decision. Some factors like no political atmosphere(16.5%), session jam free education(50%), regular keep in touch with class and exam(20.85%), modern and highly equipped education system(12.5%),failure to admit into public universities etc. have influenced them to admit there. But it is surprising that no one has confessed that they have admitted here to achieve the grade easily which is generally thought by some students

Table-2

Classification of respondents, according to their opinion, about the role of their universities to develop higher education in Bangladesh

Type of answer	Respondents'	Percentage
Positive	75	55.15%
Negative	61	44.85%
Total	136	100%

According to this table (55.15%) respondent (75) have shown their positive attitudes about their universities. They think that their universities are trying to play a positive role to the development of higher education in Bangladesh. In the same time, they have emphasized that their respective authority should ensure the parameters of quality education in tertiary level. On the contrary, 44.85% respondents (61) have provided negative answer, which is very significant. They are not satisfied at all with the existing library facilities (12.5%), quality teachers(31.25%), role of the authority(12.5%), unfriendly attitudes(25%), insufficient teaching aids(18.75%) and so on. Such types of responses have sent a question mark to some of the existing private universities.

Table-3

Classification of respondents, according to their opinion, regarding the location of the universities

Type of answer	Respondents'	Percentage
Residential Area	37	27.20%
Non residential area	24	17.65%
Commercial area	75	55.15%
Total	136	100%

Table reveals that 37 respondents (27.20%) have said that their universities are situated in residential areas as well as 75 respondents (55.15%) have pointed out the location of their universities in commercial areas. The causes of the university location are also analyzed by the respondents those who have given answers in this regard. 42.84% respondents think that their authority has established the universities due to the commercial benefit. According to 28.57%, these are for easy communication. Same numbers of respondents (28.57%) think that it is due to draw the attention of the public on the contrary 24 respondents (17.65%) have said that their universities are in the non residential areas

Table-4

Classification of respondents, according to their opinion, regarding the impact to establish the universities in commercial and residential areas

Type of answer	Respondents'	Percentage
Affect the education	124	91.17%
Don't affect	12	08.83%
Total	136	100%

According to the table 124 respondents (91.17%) have given very frustrating opinions about the location of their universities. They think that the normal atmosphere of education is actually hampered due to this problem. Of them 30% think that they can't concentrate themselves in studies properly, 26.64% think that due to the existing students, stuffs and vehicles used by them are creating huge traffic jam in these areas.43.29% have opined about the sound pollution, which greatly hampers their education. It is surprising that 12 respondents (08.83%) do not think that it hampers their study.

Table-5

Classification of respondents according to their opinion about the teacher-student relationship

Type of answer	Respondents'	Percentage
Good	26	19.11%
Satisfactory	55	40.44%
Poor	43	31.62%
Reluctant	12	8.83%
Total	136	100%

The table expresses that only 26 respondents (19.11%) think that existing teacher-student relation is good enough in their universities. 55 participants (40.44%) express their minimum satisfaction about the present relation where as 43 respondents (31.62%) are not satisfied with the existing relation between teacher and student. They think that the present relation is very poor and dissatisfactory. It is very noteworthy that all type of respondents thinks that it is very essential to have smart relation between teacher and students. Of the respondents, those who have given the opinion about the satisfactory relation 60% think that teachers generally try to maintain a minimum relation due to pressure imposed by the authority. Rest of the respondents (40%) has said that they are maintaining this relation provably due to their personal

interest. It is notable that three (12) respondents (8.83%) have not shown any interest about the issue. Their main concern is to achieve the degree anyhow.

Table-6

Classification of respondents on the basis of their opinion in question of library'

Type of answer	Respondents'	Percentage
Yes	113	83.08%
No	23	16.92%
Total	136	100%

According to the table, 113 respondents (83.08%) out of 136 have said that their universities have library of their own where as 23 respondents (16.92%) have said that their universities have no library at all.Among the positive respondents 78% think that they have sufficient modern books, journals and research papers in their libraries on the other hand 22% respondents think that though they have libraries, they are away from such opportunities. Again, among the positive respondents 53% are satisfied with the present atmosphere of the library on the other hand 19% students are less satisfied 28% students have directly said that they are not satisfied at all with the existing atmosphere. Among the dissatisfied students 33.33% think that the space of their library is very small, 22.22% students have said that they have been severely suffering from sound pollution , shortage of teaching materials such as chairs, tables, benches etc.44.44% students have said that their libraries have little upgraded and technological materials.

Table-7

Classification of respondents, according to their opinion, about the environment of the classes

Type of answer	Respondents'	Percentage
Good	37	27.20%
Non residential area	44	32.35%
Commercial area	55	40.45%
Total	136	100%

The table shows that 27.20% respondents are happy with the existing atmosphere of the classes. So they have no complained against this issue. Similarly 32.35%, think that the class atmosphere is somewhat satisfied but rest of them (40.45%) have shown their dissatisfied attitudes regarding this issue.Among the dissatisfied respondents, 35.7% think that the space of their classroom is very small. So its difficult to ensure the sound atmosphere inside the class room for their teachers.14.28% respondents have said about the shortage of different materials like chair, table, computer, internet etc. A distinguished number of students (42.84%) have directly said that they generally suffer from sound pollution. It hampers their concentration inside the classroom. 7.14% respondents have not given any answer.

Table-8

Classification of respondents, according to their opinion about the education system (duration) of their universities

Type of answer	Respondents'	Percentage
Yes	117	86.03%
No	19	13.97%
Total	136	100%

According to the information of the table, most of the respondents (86.03%) face four-month semester education system where as 13.97% said about six-month semester. Among the respondents those who told about four month semester, 35.71% think that this type of four month semester can't ensure quality education. Around same number of students (28.57%) think that this short period of semester encourages students not to enter into the depth of the course content. It also creates non-caring attitudes to the students about the exam, told by 14.29% students. Some students (14.29%) even think that this type of semester system is due to the moneymaking attitude of the owners. A little number of students (7.14%) thinks that it sometimes encourages some students to the unfair means in the exam.

Table-9

Classification of respondents, according to their opinion, regarding the subject matter of co-curriculum activities like seminar, symposium, debate, cultural functions etc

Type of answer	Respondents'	Percentage
Yes	83	61.03%
No	53	38.97%
Total	136	100%

Table shows that 61.03% respondents have given positive response about this issue where as 38.97% respondents have said that they are deprived to enjoy such kind of opportunities from their universities.

Table-10

Classification of respondents based on their responses regarding the refreshment opportunities like restaurants and gymnasium

Type of answer	Respondents'	Percentage
Yes	37	27.20%
No	99	72.80%
Total	136	100%

The table shows that almost three fourth of the respondents(72.80%) have said that their universities are very much away from such kind of opportunities where as 27.20% respondents have given positive response.

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Table-11

Classification of respondents based on their opinion regarding the issue of tuition fee they are to pay for their studies

Type of answer	Respondents'	Percentage
Satisfactory	46	33.83%
Tolerable	37	27.20%
Commercial area	53	38.97%
Total	136	100%

The table shows that approximately one-third (33.83%) students are satisfied with their existing tuition fees.27.20% students think that it is tolerable. However, a notable number of students (38.97%) think that they are not happy with the present amount of tuition fee. According to them, it is burden for their family

Table-12

Classification of respondents based on their opinion regarding the issue of subjects their universities have been dealing with.

Type of answer	Respondents'	Percentage
Job market related	83	61.03%
Subject related to art and culture	15	11.03%
Subjects related to social science	10	7.35%
Subjects related to economics	11	8.09%
Subjects related to religion and Ethics	17	12.50%
Total	136	100%

The table clearly shows that most of the universities (61.03%) have been dealing with the subjects related to the market demand. Few universities (11.03%) have been dealing with the subjects related to Art and Culture. Same number of respondents (7.35%) has talked about the subjects related to Social science, (8.09%), Economics,(12.50%), Religion and Ethics. And this number of responses is very alarming.

Table-13

Classification of respondents based on their responses regarding the issue of teaching stuff.

Type of answer	Respondents'	Percentage
Full time stuff	63	46.32%
Part time stuff	73	53.68%
Total	136	100%

The table shows that most of the universities (53.68%) have been carrying on their academic activities with the part time teachers and (46.32%) have been carrying on their academic activities with the full time teachers. Among them 25% have said that they cannot get proper help from them in time of need. 56.25% respondents have said that their teachers are not available even in the campus hour.18.75% students have observed that their full time teachers are to take a huge work load due to the little number of full time teachers.

Table-14

Classification of respondents on the basis of their responses regarding the issue of play ground

Type of answer	Respondents'	Percentage
Yes	11	8.09%
No	125	91.91%
Total	136	100%

The table clearly shows that most of the universities (91.91%) have no playground of their own. So they can't arrange different sports according to their demand. Only a few universities (8.09%) have their own playground but most of them are not in proper distance from the campus. Their universities have prepared the playground only to fulfill the criteria set by the UGC, not for the students' demand, some students perceive.

8. Recommendations:

Improving the quality of higher education in Bangladesh is a difficult job, much difficult than the teachers of a university in developed countries. But it would be easy if the people concerned in this area try to find out the root causes of the factors affecting the quality of education. According to the findings and data analysis, researchers have tried to offer some suggestions in the light of the problems they have got during their study:

a) A strong Private University Act is essential to ensure quality education in this field.

b) UGC should play a vital role ensuring them to follow specific guideline needed for library considering space, sitting arrangement, reading environment, budget allocation for resource collection, electronic catalog system, online resources use, up to date journals, software for searching and using books, alternative power supply facility, photocopy facility, sufficient number of books etc.

c) Govt. should offer subsidy to some universities to open some other subjects like literature, history, philosophy, sociology, political science etc rather than the subjects which have the market demand to maintain the social balance.

d) Universities should ensure their permanent campuses, playground, restaurant, gymnasium etc. And UGC should monitor these issues strictly.

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e) Universities need to ensure the club activities that help the students to develop their leadership quality to meet mental thirst, to develop patriotism and create opportunity to involve in social work.
f) As UGC, an apex body, cannot fight against irregularities with weak legal strength and logistics, a new act with the consultation of stakeholders is immensely needed for this sector.
g) A unified service and teachers' recruitment rules can be formulated under the guidance of UGC and private universities must follow these rules.
h) Before finalizing any new act a national debate can be arranged with the participation of various stakeholders.

9. Conclusion:

That private universities have opened a new era in the field of higher education is undeniable. But higher education must be ensured in terms of quality education. However, most of the universities are very away from such kind of infrastructure facilities like insufficient lab facilities, ICT instrument, teaching aids, laboratories, classrooms, restaurants, debate club, playground, quite and calm atmosphere etc.

To check the financial motive and at the same time ensuring quality education is really a difficult job. Nevertheless, every private university must fulfill the minimum requirements set by the UGC in terms of quality and infrastructure. What is the most essential is to take collective efforts of these universities in the growth of higher education in Bangladesh.

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Appendex-1:

List of Private Universities according to UGC list

1. Ahsanullah University of Science and Technology	27. Manarat International University
2. America Bangladesh University	28. Metropolitan University, Sylhet
3.American International University Bangladesh	29. North South University
4.ASA University Bangladesh	30.Northern University Bangladesh
5.Asian University of Bangladesh	31.Premier University, Chittagong
6. Atish Dipankar University of Science & Technology	32.Presidency University
7. Bangladesh Islami University	33. Prime University
8.Bangladesh University	34.Primeasia University
9.Bangladesh University of Business & Technology (BUBT)	35.Queens University*
10.BGC Trust University Bangladesh, Chittagong	36. Royal University of Dhaka
11. BRAC University	37.Shanto Mariam University of Creative Technology
	38. Southeast University

12. Central Women's University	39. Southern University of Bangladesh , Chittagong
13.City University	40. Stamford University, Bangladesh
14 Daffodil International University	41. State University Of Bangladesh
15. Darul Ihsan University	42.Sylhet International University, Sylhet
16.Dhaka International University	43. The Millenium University
17. East Delta University , Chittagong	44.The Peoples University of Bangladesh
18.East West University	45. The University of Asia Pacific
19. Eastern University	46 United International University
20.Gono Bishwabidyalay	47.University of Development Alternative
21.Green University of Bangladesh	48. University of Information Technology & Sciences
22.IBAIS University	
23. Independent University, Bangladesh	49. University of Liberal Arts Bangladesh
24. International Islamic University, Chittagong	50. University of Science & Technology, Chittagong
25. International University of Business Agriculture & Technology	51. University of South Asia
	52. Uttara University
26. Leading University, Sylhet	53.Victoria University of Bangladesh
	54. World University of Bangladesh

Appendeex-2:

Questionnaire

on

Factors Affecting the Quality of Higher Education: A Study on Selected Private Universities in Bangladesh

Declaration

It is ensured that all your personal profile and information would be concealed.

Please give your answers and opinions without hesitation because it is simply a research work. Please provide your answer by your own ideas. You are cordially requested not to be influenced by others to give the answers. Your cooperation is very essential for us.

Thank you for your nice cooperation.

Personal information of the interviewers

Name: Age: Educational qualification:

Father's name: Mother's name:

Father's educational qualification: Mother's educational qualification:

Father's monthly income: Mother's monthly income:

Name of your own University:

Questions

1. Have you been influenced by anyone/anybody to admit into the Private University?
   a) Yes b) No
2. If the answer is yes, by whom have you been influenced?
   a) Parents b) Friends c) Teachers d) None e) Others (write):
3. What is the reason of your decision to study in Private University?
   a) Session jam free education. b) Non political atmosphere
   c) Modern and high quality education. d) Due to failure to admit into Public Universities
   e) Others (Please write):
4. As a student of Private University what is your opinion about the role of these universities to develop Higher education in Bangladesh?
   a) positive. b) Negative c) No comment d) others (write):
5. Please point out the location of your University campus.
   a) Residential area b) Commercial area/ market place. c) Open and non residential area
   d) Highly residential and road side area e) others (please write)
6. What do you think about the decision of the owners to establish the university in residential / commercial / road side areas?
   a) To draw the attention easily b) For easy communication c) Lack of farseeing power.
   d) Commercial and professional out look. e) Others (please write).
7. Is the normal atmosphere of education hampering for establishing the university in these areas?
   a) Yes b) No
8. In case of problems what are they like?
   a) Sound pollution b) Lack of concentration of the students due to the surroundings
   c) Traffic jam d) Hew and cry e) Others (please write):
9. Do you think student- teacher relationship is important to fulfill the aims of Higher Education?
   a) Yes b) No.
10. If answer is right then how is the relation between students and teachers in your university?
    a) Cooperative b) Non cooperative c) Reluctant d) Patron-client e) others

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11. What is the quality, according to you, of the teachers of your University?
a) Good b) Satisfactory c) Average d) Not good e) Others.
12. If the quality of the teachers is not satisfactory, what is the reason?
a) Insufficient salary provided by the owners to the teachers b) Insecurity of the job
c) To carry on the education by the part time teachers appointed by violating the of rules
d) Lack of sufficient training and motivation e) No extra bonus or opportunities for the teachers.
13. Is any evaluation of the students accepted?
a) Yes b) No
14. If the answer is yes, is it implemented?
a) Yes b) No.
15. Is there any counseling period (visiting period for the students to solve the problems) in your University?
a) Yes b) No
16. If the answer is yes, what is your opinion/ evaluation about this issue?
a) Good b) Satisfactory c) Average d) Not satisfactory e) Others (write):
17. If the counseling period is not sufficient, who/what is responsible for that?
a) Lack of interest of the teachers. b) Lack of self interest of the students
c) Lack of interest of the authority (not to adjust the time to the routine)
d) No separate office regarding this issue. e) Others (please write):
18. Do you think that students would be benefited by this counseling session?
a) Yes b) No.
19. If the answer is yes, how?
a) It creates enthusiasm to search knowledge. b) It creates inspiration to share the knowledge
c) It helps to adjust the atmosphere d) It boosts students to present them in the best way.
e) Others (please write):
20. Is there any library to your University?
a) Yes b) No.
21. If yes, are there sufficient modern books, journals and research papers in this library?
a) Yes b) No
22. How is the environment of the library?
a) Good b) Satisfactory c) Average d) Not satisfactory e) Others (please write):
23. What are the reasons for dissatisfactory atmosphere of the library?
a) Space of the library is small b) Shortage of materials (chairs, tables, benches etc.)
c) Sound pollution d) Lack of technological opportunities (computer, internet, electricity etc.)
e) Lack of updated and upgraded materials.
24. How is the environment of the classes?
a) Good b) Satisfactory c) Average d) Not satisfactory e) Others (please write)
25. What is the reason for dissatisfied atmosphere of the class rooms?
a) Space of the class room is small b) Shortage of materials (chairs, tables etc.)
c) Lack of technological opportunities (computer, internet, fan, electricity etc.)
d) Sound pollution e) Lack of updated and upgraded materials.
26. What types of exam system are there in your university?
a) 4 month semester b) 6 month semester
27. What is your opinion about the 4 month semester exam system?
a) It cannot ensure the quality education. b) It encourages the unfair means of the students
c) It creates non-caring attitude to the students about the exam
d) It encourages students not to enter into the depth of the subject. e) Others (please write):
28. How is the atmosphere of the exam?
a) Good b) Satisfactory c) Average d) Not satisfactory e) Others (please write):
29. What are the reasons for this dissatisfactory atmosphere of the exam?
a) Space of the exam room is very small b) Shortage of materials (chairs, tables etc)
c) Sound pollution d) Lack of proper invigilation in the exam. e) Others (please write)
30. Does the higher authority of your university check your progress during the semester?
a) Yes b) No.
31. Don't you think it is helpful for improving your quality and motivation?
a) Yes b) No.
32. What is your reaction and evaluation about the tuition fee of your university?
a) Good b) Satisfactory c) Tolerable d) Burden e) Others (please write)
33. Does your university offer scholarship to the bright and needy students?
a) Yes b) No.
34. Does your university encourage you to arrange seminars, symposium, debate etc?
a) Yes b) No
35. Does your university arrange annual cultural function?
a) Yes b) No

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36. Are there any refreshment opportunities (common room, restaurant etc) during the office hours in your university?
    a) Yes b) No
37 Is there any gymnasium in your university?
    a) Yes b) No
38. What is your overall reaction about the quality of your university?
    a) Good b) Satisfactory c) Average d) Not satisfactory e) Others (please write)
39. What, according to you, are the obstacles to ensure the quality education?
    a) Shortage of sufficient qualified full time teachers
    b) Insufficiency of quality and modern library including necessary books and journals
    c) Necessity of well infrastructural opportunities and play ground
    d) Insufficiency of technological (computer, internet, projector etc) opportunities
    e) Showing disinterest of the authority to arrange the extra curriculum activities (debate, presentation, magazine, wall paper etc) to flourish the knowledge
40. What type of subjects has your university been dealing with?
    a) Job market related. b) Subject related to art and culture
    c) Subject related to social science d) Subject related to economics
    e) Subject related to religion and ethics
41. What type of teachers are there in your universities?
    a) Mostly full time teachers b) Mostly part time teachers c) Mostly foreign teachers
    d) No comment.
42. Does your university have its own play ground?
    a) Yes b) No

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Impact of new financial products on Financial performance of Public Sector Banks in India

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Abstract

In this paper, we analyze the performance of public sector banks in India during the period 1999-2000 to 2008-09. This period covers the old financial products period and new financial products period. Specifically, the paper examines the impact of new financial products on financial performance of public sector banks in India. The empirical results show that impact of new financial product on public sector banks has intensified. The financial performance of public sector banks is greater in new financial products than the old financial products period.

Key words: Banking, public sector banks, new financial products period, old financial products period.

Introduction:

The word 'Bank' is said to be derived from French word "Bancus" or "Banque", i.e., a bench. It is believed that the early bankers, the Jews of Lombardy, transacted their business on benches in the marketplace. Others believe it is derived from German word "Back" meaning a Joint Stock Fund.

Banking in India originated in the last decades of the 18th century. The first banks were The General Bank of India, which started in 1786, and Bank of Hindustan, which started in 1790; both are now defunct. The oldest bank in existence in India is the State Bank of India, which originated in the Bank of Calcutta in June 1806, which almost immediately became the Bank of Bengal. This was one of the three presidency banks, the other two being the Bank of Bombay and the Bank of Madras, all three of which were established under charters from the British East India Company. For many years the Presidency banks acted as quasi-central banks, as did their successors. The three banks merged in 1921 to form the Imperial Bank of India, which, upon India's independence, became the State Bank of India in 1955.

New financial products in the recent years

ICICI Bank has launched `Global Indian Credit Card' for NRIs. It is an international credit card denominated in Indian rupees and will cater to NRIs visiting India. It can be issued in both India and overseas. The card is available in two variants — Silver with maximum credit limit of Rs 1,00,000 and Gold with maximum credit limit of Rs 3,00,000. The cards also provide insurance, which includes household insurance, baggage insurance and hospitalisation benefits for both primary and add-on cards up to Rs 20 lakh. The card will be accepted at 22 million merchant establishments and the re-payment for purchases can be made through an automatic debit of the customer's savings account.

Bank of Rajasthan (BoR) has launched international credit card operations in December 2005. Bank has joined hands with Visa International to facilitate real-time transaction through Visa gateway. Bank of Rajasthan will offer three types of international credit cards - Silver Card, Gold Card and Platinum card. Their features include hospitalisation expenses covered up to Rs 50,000, baggage insurance expenses up to Rs 30,000, purchase protection up to Rs 40,000 and 30 per cent credit limit against cash advance. It has also tied up with Electra Card Services (ECS) to provide complete back-end support for the bank's credit card business.

SBI Card in March 2005 launched a credit card, SBI Social Card, the first affinity card in the country to feature four non-governmental organizations (NGOs). The social card allows the cardholder to donate to the NGOs every time they use it. The card will earn the customers double reward points. While one half will go to the NGOs. SBI Card will donate 20 per cent of the annual fees or renewal fees to the NGOs. Moreover, customers also have the option to issue standing instructions for a fixed amount to be donated to any of the NGOs.

The non-governmental organisations that have the tie-up with SBI Card are Cancer Patients Aid

Association, National Association for the Blind, SOS Children's Villages of India and World Wildlife Fund, India.

National Securities Depository Ltd (NSDL) and IDBI Bank have launched country's first online direct tax payment facility. This facility will enable individuals as well as corporate tax payers, to make payments for income tax, corporation tax, gift tax, tax deducted at source (TDS) etc over internet. The details entered by the assessee would be validated by NSDL and control would be passed to IDBI bank through a secure payment gateway. The bank will debit the customer account after authentication and completes the payment of tax to the government as an agency bank for which it will be paid a service charge.

IDBI bank also plans to migrate this facility to other channels like mobile phones and ATMs. State Bank of India (SBI), Corporation Bank, Punjab National Bank and Bank of India are expected to soon roll out online direct tax payment facility.

List of Public sector banks in India:

Nationalised Banks

1 Allahabad Bank
2 Andhra Bank
3 Bank of Baroda
4 Bank of India
5 Bank of Maharashtra
6 Canara Bank
7 Central Bank of India
8 Corporation Bank
9 Dena Bank
10 IDBI Bank Ltd.
11 Indian Bank
12 Indian Overseas Bank
13 Oriental Bank of Commerce
14 Punjab & Sind Bank
15 Punjab National Bank
16 Syndicate Bank
17 UCO Bank
18 Union Bank of India
19 United Bank of India
20 Vijaya Bank

State Bank Group

21 State Bank of Bikaner & Jaipur
22 State Bank of Hyderabad
23 State Bank of India
24 State Bank of Indore
25 State Bank of Mysore
26 State Bank of Patiala
27 State Bank of Travancore

Objective of the study:

The objective of the study is to find the impact of new financial products on performance of public sector banks in India.

Research methodology

The present paper is concerned with the Indian banking industry. Total 27 public sectors banks have been selected for to know the impact of new financial products on performance of public sector banks. The period of the study is for 10 years i.e from 1999-00 to 2008-09. The period is divided into old financial products period from 1999-00 to 2004-05 and new financial products period from 2005-06 to 2008-09.

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Reserves and Surplus of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	31,818.73	100	17,334.98	100	14,483.75	100
2000-01	35,358.25	111.12	18,998.94	109.59886	16,359.31	112.949
2001-02	42,276.10	132.87	23,253.09	134.1397	19,023.01	131.34
2002-03	51,407.16	161.56	29,310.14	169.0809	22,097.02	152.564
2003-04	64,566.94	202.92	37,853.46	218.3646	26,713.48	184.438
2004-05	79,139.46	248.72	47,411.18	273.50006	31,728.28	219.061
2005-06	1,02,714.03	322.81	60,441.49	348.66778	36,624.28	252.865
2006-07	1,23,210.48	387.23	73,729.42	425.32163	41,905.56	289.328
2007-08	1,61,721	508.26	93,484	539.27954	60,140	415.224
2008-09	1,94,762	612.1	1,14,721	661.78905	71,341	492.559
Total	8,86,974.15		4,01,816.70		3,40,415.69	
Mean	88,697.415	278.76	40,181.67	231.79531	34,041.56	235.033

The above table exhibits the Reserves and surplus of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show continuous increase in reserves and surplus amounts from 31,818.73 crores in the year1999-00 with the 100 trend in percentage to 194,762 crores in the year 2008-09 with the 612.1 trend in percentage. During the old financial products period from 1999-00 to 2004-05 Reserves and surplus are below the mean of 278.76 and in the new financial products period from 2005-06 to 2008-09 Reserves and surplus are above the mean of 278.76 for the public sector banks.

Nationalized banks show continuous increase in reserves and surplus from 17,334.98 crores in the year 1999-00 with 100 trend percentage to 1,14,721 crores in the year 2008-09 with the 661.79 trend percentage. During the old financial products period from 1999-00 to 2004-05 reserves and surplus are below the mean of 231.79 and in the new financial products period from 2005-06 to 2008-09 reserves and surplus are above the mean of 231.79 for the nationalized banks.

On the other hand, the State bank Group also shows continuous increase in reserves and surplus from 14,483.75 crores in the year 1999-00 with 100 trend in percentage to 71,341 crores in the year 2008-09 with the 492.55 trend in percentage. During the old financial products period from 1999-00 to 2004-05 reserves and surplus are below the mean of 235.03 and in the new financial products period from 2005-06 to 2008-09 reserves and surplus are above the mean of 235.03 for the State bank Group.

Borrowings of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	19,425.33	100.00	8,864.93	100.00	10,560.40	100
2000-01	20,084.40	103.39	8,679.36	97.91	11,405.04	107.9982
2001-02	19,363.03	99.68	9,311.23	105.03	10,051.80	95.18389
2002-03	22,431.04	115.47	10,838.48	122.26	11,592.56	109.7739
2003-04	30,256.50	155.76	13,441.07	151.62	16,815.43	159.231
2004-05	42,874.14	220.71	19,398.71	218.83	23,475.43	222.2968
2005-06	1,15,250.06	593.30	30,635.56	345.58	37,084.29	351.1637
2006-07	1,21,772.60	626.88	31,045.30	350.20	48,322.92	457.5861
2007-08	1,56,357	804.91	47,943	540.82	64,591	611.634

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2008-09	1,58,305	814.94	51,647	582.60	62,240	589.3716
Total	7,06,119.10		2,31,804.64		2,96,138.87	
Mean	70,611.91	363.50	23,180.46	261.48	29,613.88	280.4238

The above table exhibits the borrowings of Public sector Banks, Nationalized Banks, State Bank Group and it's Trend Percentages from 1999-00 to 2008-09. Public sector banks show increase in borrowings from 19,425.33 crores in the year 1999-00 with the 100 trend in percentage to 158,305 crores in the year 2008-09 with the 814.94 trend in percentage even there is a slight decrease of 19,363.03 crores in the year 2001-02 with the 99.68 trend in percentage. During the old financial products period from 1999-00 to 2004-05 borrowings are below the mean of 363.50 and in the new financial products period from 2005-06 to 2008-09 borrowings are above the mean of 363.50 for the public sector banks.

Nationalized banks show continuous increase in borrowings from 8,679.36 crores in the year 2000-01 with 97.91 trend in percentage to 51,647 crores in the year 2008-09 with trend in percentage 582.60. During the old financial products period from 1999-00 to 2004-05 borrowings are below the mean of 261.48 and in the new financial products period from 2005-06 to 2008-09 borrowings are above the mean of 261.48 for the nationalized banks.

On the other hand, the State bank Group also shows continuous increase from the year 1999-00 with the borrowings amount of 10,560.40 crores with the 100 trend in percentage to 62,240 crores in the year 2008-09 with 589.37 trend in percentage. During the old financial products period from 1999-00 to 2004-05 borrowings are below the mean of 280.42 and in the new financial products period from 2005-06 to 2008-09 borrowings are above the mean of 280.42 for the State bank Group.

Total liabilities of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	8,90,600.05	100.00	5,54,205.72	100	3,36,394.33	100
2000-01	10,29,769.59	115.63	6,26,892.12	113.115	4,02,877.47	119.763
2001-02	11,55,397.68	129.73	7,06,109.02	127.409	4,49,288.66	133.56
2002-03	12,85,235.70	144.31	7,91,281.43	142.778	4,93,954.27	146.838
2003-04	14,71,077.38	165.18	9,21,953.66	166.356	5,49,123.72	163.238
2004-05	16,92,578.55	190.05	10,65,503.85	192.258	6,27,074.70	186.411
2005-06	20,14,874.09	226.24	12,34,462.40	222.744	6,91,846.91	205.665
2006-07	24,39,985.92	273.97	15,30,351.44	276.134	8,05,795.15	239.539
2007-08	30,21,924	339.31	18,80,271	339.273	10,10,959	300.528
2008-09	37,66,716	422.94	23,14,102	417.553	12,80,212	380.569
Total	1,87,68,158.96		1,16,25,132.64		66,47,526.21	
Mean	18,76,815.89	210.74	11,62,513.26	209.762	6,64,752.62	197.611

The above table exhibits the total liabilities of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show continuous increase in its total liabilities from 890,600.05 crores in the year 1999-00 with the 100 trend in percentage to 3766,716 crores in the year 2008-09 with 422.94 trend in percentage. During the old financial products period from 1999-00 to 2004-05 total liabilities is below the mean of 210.74 and in the new financial products period from 2005-06 to 2008-09 total liabilities is above the mean of 210.74 for the public sector banks.

Nationalized banks show continuous increase in total liabilities from 554,205.72 crores in the year 1999-00 with 100 trend in percentage to 2314,102 crores in the year 2008-09 with trend in percentage 417.53. During the old financial products period from 1999-00 to 2004-05 total liabilities are below the mean of 209.76 and in the new financial products period from 2005-06 to 2008-09 total liabilities are above the mean of 209.76 for the nationalized banks.

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On the other hand, the State bank Group also shows continuous increase from the year 1999-00 with the total liabilities of 336,394.33 crores with the 100 trend in percentage to 1280,212 crores in the year 2008-09 with 380.56 trend in percentage. During the old financial products period from 1999-00 to 2004-05 total liabilities are below the mean of 197.61 and in the new financial products period from 2005-06 to 2008-09 total liabilities are above the mean of 197.61 for the State bank Group.

Cash and balances with RBI of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	70,791.53	100.00	45,577.96	100.00	25,213.57	100
2000-01	69,866.39	98.69	45,341.37	99.48	24,525.02	97.2691
2001-02	71,407.46	100.87	44,120.06	96.80	27,287.40	108.225
2002-03	65,166.62	92.05	46,054.48	101.05	19,112.14	75.801
2003-04	84,241.76	119.00	58,079.66	127.43	26,162.10	103.762
2004-05	87,616.41	123.77	62,396.21	136.90	25,220.20	100.026
2005-06	1,12,769.50	159.30	79,060.86	173.46	31,028.55	123.063
2006-07	1,42,211.48	200.89	91,977.73	201.80	44,827.28	177.79
2007-08	2,29,679	324.44	1,48,271	325.31	74,714	296.325
2008-09	2,24,141	316.62	1,41,443	310.33	74,107	293.917
Total	11,57,891.15		7,62,322.33		3,72,197.26	
Mean	1,15,789.11	163.56	76,232.23	167.26	37,219.72	147.618

The above table exhibits the cash and balances with RBI of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show fluctuations in its cash and balances with RBI from 70,791.53 crores in the year 1999-00 with the 100 trend in percentage to 65166.62 crores in the year 2002-03 with 92.05 trend in percentage and then it show a continuous increase in its cash and balances with RBI till 2007-08 with the amount 229,679 crores with the trend in percentage 324.44. During the old financial products period from 1999-00 to 2004-05 cash and balances with RBI is below the mean of 163.56 and in the new financial products period from 2005-06 to 2008-09 cash and balances with RBI is above the mean of 163.56 for the public sector banks.

Nationalized banks show decrease in cash and balances with RBI from the year 1999-00 to 2001-02 and there is a continuous increase from the year 2002-03 with the cash and balances with RBI amount of 46054.48 crores with trend in percentage of 101.05 to 141,443 crores in the year 2008-09 with trend in percentage of 310.33. During the old financial products period from 1999-00 to 2004-05 cash and balances with RBI is below the mean of 167.26 and in the new financial products period from 2005-06 to 2008-09 cash and balances with RBI are above the mean of 167.26 for the nationalized banks.

On the other hand, the State bank group has very less cash and balances with RBI in the year 2002-03 with 26,162.10 crores and the 75.80 trend in percentage and it shows a continues increase from the year 2003-04 to 2008-09 with the cash and balances with RBI amount of 74,107 crores with 293.91 trend in percentage. During the old financial products period from 1999-00 to 2004-05 cash and balances with RBI are below the mean of 147.61 and in the new financial products period from 2005-06 to 2008-09 cash and balances with RBI are above the mean of 147.61 for the State bank Group.

Fixed Assets of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage

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1999-00	10,019.73	100.00	7,126.45	100.00	2,893.28	100
2000-01	10,456.26	104.36	7,411.10	103.99	3,045.16	105.249
2001-02	10,440.08	104.20	7,551.19	105.96	2,888.89	99.8483
2002-03	10,592.98	105.72	7,667.66	107.59	2,925.32	101.107
2003-04	11,531.49	115.09	8,181.99	114.81	3,349.50	115.768
2004-05	12,552.02	125.27	9,088.12	127.53	3,463.90	119.722
2005-06	14,668.92	146.40	9,907.32	139.02	3,950.71	136.548
2006-07	20,195.16	201.55	13,455.22	188.81	3,961.58	136.923
2007-08	28,797	287.40	21,440	300.85	4,591	158.678
2008-09	33,743	336.77	25,407	356.52	5,512	190.51
Total	1,62,996.64		1,17,236.05		36,581.34	
Mean	16,299.66	162.68	11,723.60	164.51	3,658.13	126.435

The above table exhibits the fixed assets of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show continuous increase in its fixed assets from 10,019.73 crores in the year 1999-00 with the 100 trend in percentage to 33,743 crores in the year 2008-09 with 336.77 trend in percentage. During the old financial products period from 1999-00 to 2004-05 fixed assets are below the mean of 162.68 and in the new financial products period from 2005-06 to 2008-09 fixed assets are above the mean of 162.68 for the public sector banks.

Nationalized banks show continuous increase in fixed assets from 7,126.45 crores in the year 1999-00 with 100 trend in percentage to 25,407 crores in the year2008-09 with trend in percentage 356.52. During the old financial products period from 1999-00 to 2004-05 fixed assets are below the mean of 164.51 and in the new financial products period from 2005-06 to 2008-09 fixed assets are above the mean of 164.51 for the nationalized banks.

On the other side, the State bank group also shows continuous increase from the year 1999-00 with the fixed assets of 2,893.28 crores with the 100 trend in percentage to 5,512 crores in the year 2008-09 with 190.51 trend in percentage even though there is some decrease in the years 2001-02 and 2002-03 and there is a very less fixed assets in the year 2001-02 with the amount of 2888.89 with the trend in percentage of 99.84. During the old financial products period from 1999-00 to 2004-05 fixed assets are below the mean of 126.43 and in the new financial products period from 2005-06 to 2008-09 fixed assets are above the mean of 126.43 for the State bank Group.

Other Assets of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	57,717.59	100.00	31,667.21	100.00	26,050.38	100
2000-01	57,860.11	100.25	37,029.00	116.93	20,831.11	79.9647
2001-02	59,462.32	103.02	38,075.24	120.24	21,387.08	82.0989
2002-03	57,299.91	99.28	33,221.50	104.91	24,078.41	92.4302
2003-04	58,308.21	101.02	34,332.05	108.42	23,976.16	92.0377
2004-05	60,483.70	104.79	35,593.35	112.40	24,890.35	95.547
2005-06	73,174.63	126.78	36,673.43	115.81	32,199.70	123.605
2006-07	78,360.13	135.76	38,552.10	121.74	33,804.30	129.765
2007-08	1,02,619	177.80	43,426	137.13	55,039	211.279
2008-09	1,04,707	181.41	49,984	157.84	49,840	191.322
Total	7,09,992.60		3,78,553.88		3,12,096.49	
Mean	70,999.26	123.01	37,855.38	119.54	31,209.64	119.805

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The above table exhibits the other assets of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show continuous increase in its other assets from 57,717 crores in the year 1999-00 with the 100 trend in percentage to 104,707 crores in the year 2008-09 with 181.41 trend in percentage and even there is a decrease in other assets in the year 2002-03 with the amount 57,299.91 crores with the trend in percentage of 99.28. During the old financial products period from 1999-00 to 2004-05 other assets is below the mean of 123.01 and in the new financial products period from 2005-06 to 2008-09 other assets are above the mean of 123.01 for the public sector banks.

Nationalized banks show continuous increase in other assets from the year 1999-00 to 2002-03 and there was some decrease in other assets in the year 2003-04 with amount 33,221.50 crores with the trend in percentage of 104.91 and then show a continuous in increase in other assets till the year 2008-09 with the amount of 49,984 crores with the trend in percentage of 157.84. During the old financial products period from 1999-00 to 2004-05 other assets is below the mean of 119.84 and in the new financial products period from 2005-06 to 2008-09 other assets are above the mean of 119.84 for the nationalized banks.

On the other hand, the State bank group shows decrease in other assets from the year 1999-00 to 2004-05 with the amount of 24,890.35 in the year 2004-05 with the trend in percentage of 95.54 and then show a continues increase in other assets till the year 2008-09 with amount of 49,840 crores with the trend in percentage of 191.32. During the old financial products period from 1999-00 to 2004-05 other assets are below the mean of 119.80 and in the new financial products period from 2005-06 to 2008-09 other assets are above the mean of 119.80 for the State bank Group.

Total Assets of Public sector Banks, Nationalized banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09.

(Amount in Crores)

Year	Public Sector Banks	Trend in percentage	Nationalized Banks	Trend in percentage	SB Group	Trend in percentage
1999-00	8,90,600.05	100.00	5,54,205.72	100.00	3,36,394.33	100
2000-01	10,29,769.59	115.63	6,26,892.12	113.12	4,02,877.47	119.763
2001-02	11,55,397.68	129.73	7,06,109.02	127.41	4,49,288.66	133.56
2002-03	12,85,235.70	144.31	7,91,281.43	142.78	4,93,954.27	146.838
2003-04	14,71,077.38	165.18	9,21,953.66	166.36	5,49,123.72	163.238
2004-05	16,92,578.55	190.05	10,65,503.85	192.26	6,27,074.70	186.411
2005-06	20,14,874.09	226.24	12,34,462.40	222.74	6,91,846.91	205.665
2006-07	24,39,985.92	273.97	15,30,351.44	276.13	8,05,795.15	239.539
2007-08	30,21,924	339.31	18,80,271	339.27	10,10,959	300.528
2008-09	37,66,716	422.94	23,14,102	417.55	12,80,212	380.569
Total	1,87,68,158.96		1,16,25,132.64		66,47,526.21	
Mean	18,76,815.89	210.74	11,62,513.26	209.76	6,64,752.62	197.611

The above table exhibits the total assets of Public sector Banks, Nationalized Banks, State Bank Group and its Trend Percentages from 1999-00 to 2008-09. Public sector banks show continuous increase in its total assets from 890,600.05 crores in the year 1999-00 with the 100 trend in percentage to 3766,716 crores in the year 2008-09 with 422.94 trend in percentage. During the old financial products period from 1999-00 to 2004-05 total assets was below the mean of 210.74 and in the new financial products period from 2005-06 to 2008-09 total assets was above the mean of 183.83 for the public sector banks.

Nationalized banks show continuous increase in total assets from 554,205.72 crores in the year 1999-00 with 100 trend in percentage to 2314,102 crores in the year 2008-09 with trend in percentage of 417.55. During the old financial products period from 1999-00 to 2004-05 total assets are below the mean of 209.76 and in the new financial products period from 2005-06 to 2008-09 total assets are above the mean of 209.76 for the nationalized banks.

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On the other side, the State bank group also shows continuous increase in total assets from the year 1999-00 with the amount 336,394.33 crores with the 100 trend in percentage to 1280,212 crores in the year 2008-09 with 380.56 trend in percentage. During the old financial products period from 1999-00 to 2004-05 total assets are below the mean of 197.61 and in the new financial products period from 2005-06 to 2008-09 total assets are above the mean of 197.61 for the State bank Group.

Conclusions:

Economic development of any country is mainly influenced by the growth of the banking industry in that country. The current study has been conducted to examine the impact of new financial products on performance of public sector banks in India during the period 2000-09. The study revealed that

- The public sector banks, nationalized banks and state bank group have fewer reserves and surplus amounts in the old financial products period and during the new financial products have more reserves and surplus amounts.
- The public sector banks, nationalized banks and state bank group have less borrowing in old financial products period and during the new financial products have more borrowings amounts.
- The public sector banks, nationalized banks and state bank group have less total liabilities amounts in old financial products period and during the new financial products have more total liabilities amounts.
- The public sector banks, nationalized banks and state bank group have less cash and balances with RBI amounts during the old financial products period and during the new financial products have more cash and balances with RBI amounts.
- The analysis during the old financial products period the public sector banks, nationalized banks and state bank group have less fixed assets amounts and during the new financial products period have more fixed assets amounts.
- The analysis during the old financial products period the public sector banks, nationalized banks and state bank group have less other assets amounts and during the new financial products period have more other assets amounts.
- The analysis during the old financial products period the public sector banks, nationalized banks and state bank group have less total assets amounts and during the new financial products period have more total assets amounts.

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"TRENDS AND PATTERNS OF FLOW OF FDI IN DEVLOPED COUNTRIES AND DEVLOPING COUNTRIES: A COMPARISON."

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ABSTRACT

Foreign direct investment (FDI) in India has played an important role in the development of the Indian economy. It has in lot of ways facilitated India to achieve a certain degree of financial stability, growth and development. The objective of the paper is to analyse the trends of Inflows during 1991-2011(study period) in India and to know about the global scenario and to examine the relationship of liberalised regime pursued by the countries with the level of FDI stock. To empirically test this relationship, Regression analysis was carried out between FDI Restrictiveness Index (FDI Index) and level of FDI stock and the results reveal a significant relationship between this index and the level of FDI stock. This index measures statutory restriction, all discriminatory measures affecting foreign investors, including market, access restrictions and departures from national treatment and gives scores to the respective countries in this endeavour. This study will give more insights about the policy framework to be followed by the countries to increase the flow of FDI inflows especially in the developing countries as for them this is the engine for economic growth.

Key words: discriminatory measures, Investment, Trade, Economic Growth, Restrictiveness index

SECTION 1: INTRODUCTION

Foreign direct investment (FDI) in India has played an important role in the development of the Indian economy. It has in lot of ways facilitated India to achieve a certain degree of financial stability, growth and development. This money has endorsed India to focus on the areas that needed a boost and economic attention, and address the various problems that continue to challenge the country. Foreign direct investment is considered to be one of the important measures of increasing economic globalization. Many policy makers and academicians contend that foreign direct investment (FDI) can have important positive effects on a host country's development effort. FDIs are permitted through financial collaborations, through private equity or preferential allotments, by way of capital markets

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through euro issues, and in joint ventures. FDI is not permitted in the arms, nuclear, railway, coal or mining industries.

The objective behind allowing FDI is to harmonize and complement domestic investment, for achieving a higher level of economic development and providing more opportunities for upgradation of technologies as well as to have an access to global managerial skills and practices. Therefore Foreign Direct Investment (FDI) has become a battle ground in the emerging economies. In addition to the direct capital financing it supplies, FDI can be a source of valuable technical know-how while nurturing the linkages with local firms, which can help the economy on the path of the development. Based on these arguments, industrialized and developing countries have offered incentives to encourage foreign direct investments in their economies. Foreign direct investment (FDI) in India has played a very important role in the growth of the Indian economy even during the time of the recession. FDI in India has facilitated India to achieve a definite degree of growth, development and financial stability. FDI has allowed India to centre on the areas that may have required economic attention and many other challenging issues faced by the Indian economy. There are many factors that have attracted investment in India such as stable economic policies, availability of cheap and quality human resources.

The vast literature on foreign direct investment and multinational corporations has been surveyed many times. For recent surveys see Markusen (1995) and Caves (1996).There is a considerable decrease in the tariff rates on various importable goods. Further, the explosive growth of FDI gives opportunities to Indian industry for technological upgradation, gaining access to global managerial skills and practices, optimizing utilization of human and natural resources and competing internationally with higher efficiency. Most importantly FDI is central for India's integration into global production chains which involves production by MNCs spread across locations all over the world. (Economic Survey 2003-04). The shift of the power centre from the western countries to the Asia sub –continent is yet another reason to take up this study.

Last two decades there has been an impressive growth of FDI in the global landscape. This shows a noticeable change in the expansion strategy of both developed and developing countries which has stirred FDI in many ways. There are number of rewards which are linked with FDI as this is a win-win situation both for home and host countries as they derive payback from open vast global network especially to take advantage of research and development from advance countries, increase foreign exchange, Technology diffusion and knowledge transfer, Managerial skills, increase technical know-how, access to markets, skills and practices etc. It is considered as the main explanation for bridging all the scarcities in new economic liberalised global regime and the only way to integrate with the world economy in the track of growth. The objective of the present paper is to analyse the trends and patterns of FDI in developed and developing countries with special reference to India for the

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period 1991-2011and to find out whether there exists a significant relationship between OECD FDI Regulatory Index (which is a tool for benchmarking countries measuring reforms and assessing its impact on FDI) and FDI stock. The result which is revealed from the study will give more directions to move on the path of liberalisation to further increase the FDI inflows, which is having a significant role to play in the developing countries.

This period is very important for a many reasons mainly because we opened our doors to MNCs in a liberalised regime. During this period there was a inclusive change in policy frame work and the outlook of developed and developing countries towards FDI owing to its benefits it has in the host country and was also considered as an important source of external finance.

To achieve the objective of the study, this paper is divided into six sections. Section 1 i.e. is the present section gives the insights of nature and flows of FDI scenario in India relating to policy issues and its importance. Section 11 gives brief review of literature, followed by section 111 which gives research objectives, hypothesis, data and methodology. Section 1V entails results and interpretations. Summary is included in Section V, followed by references are covered in last section.

SECTION 11: REVIEW OF LITERATURE

The complete literature centered on economies pertaining to empirical findings and Growth and development of any economy in the post liberalization period. Morris Sebastian44 (1999) Morris Sebastian presented 14 case studies of firms in the textiles, paper, light machinery, consumer durables and oil industry in Kenya and South East Asia . This study concluded that the home-grown private corporate sector is the major source of investments. The current system of tariff and narrow export policy are other reasons that have motivated market seeking FDI. Wealth seeking FDI has started to create a substantial portion of FDI from India. Naga Raj R45 (2003) presented the trends in FDI in India in the 1990s and compared them with China. Based on the analytical conversation and comparative experience, the study concluded by suggesting a more realistic foreign investment policy framework is required to expect increased flow of FDI. Nayak D.N (2004) observed that India does not outline very much in the investment plans of Canadian firms due to indifferent attitude of Canadians towards India and lack of information of investment opportunities in India and there was a suggestion that regular publications in this regard will go a long way in increasing the flow of investment in India. Chandan Chakraborty, Peter Nunnenkamp8 (2004) assessed the growth implications of FDI in India by subjecting industry – specific FDI and output data to Granger causality tests within a panel co -integration framework and suggested that FDI is unlikely to work wonders in India if only remaining regulations were relaxed and still more industries opened up for FDI.

Kulwinder Singh38 (2005) critically analyzed fdi in India and concluded that the impact of the reforms in India on the policy environment for FDI presents a mixed picture. Also the industrial reforms have gone far; though they need to be supplemented by more infrastructure reforms o make India a better

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investment center. Nirupam Bajpai and Jeffrey D. Sachs47 (2006) concluded that a restricted FDI regime, high import tariffs, exit barriers for firms, stringent labor laws, poor quality infrastructure, centralized decision making processes, and a very limited scale of export processing zones make India an Unattractive investment spot. Balasubramanyam V.N Sapsford David (2007) compared the levels of FDI inflows in India and China, and found that FDI in India is one tenth of that of china. According to their findings the country may need much larger volumes of FDI than it currently attracts if it were to attain growth rates in excess of 10 per cent per annum. Finally, they conclude that India is now in a position to implement the FDI Package efficiently and also rely on sources other than FDI for its requirements of capital owing to its potential. Basu P., Nayak N.C, Vani Archana5 (2007) studied the qualitative shift in the FDI inflows in India in – depth in the last fourteen odd years and came on the conclusion that the country is not only cost – effective but also hot target for R&D activities. It was also found that R&D as a significant determining factor for FDI inflows for most of the industries in India. The study also concluded strong negative influence of corporate tax on FDI inflows. A S Shiralashetti and S S Hugar (2009) analyzed the initiatives of The Government of India to attract FDI inflows, to boost the Indian economy since economic liberalization on the basis of different parameters such as year-wise, country-wise, sector-wise and region-wise FDI inflows. The study concluded though FDI inflows into India have raised, yet it is very less compared to some developing countries like China, Russia, Mexico, Brazil and Chile, etc.therefore, there is an urgent need to adopt inventive policies and good corporate Governance practices correlated with international standards, by the Government of India, to attract more and more foreign capital in various sectors of the economy to make India a developed country. Narayan Chandra Pradhan (2011) in his studies observed that although there is governance of manufacturing sector in the East Asian economies, the FDI to India has flown principally to the services sector. This reflects the service led growth of the Indian economy. Dr. P.S. Vohra; Ms. Preeti Sehgal(2011) analyzed the trends and patterns of foreign investment in India and concluded that Indian has proved itself as the Investment attractive country especially in the service sector which provides low employment opportunities. The study asserted that foreign investments assisted the Indian Economic Growth But it assisted only the internal growth not in the external India's Export level is still low as compare to Import. There are very few comprehensive studies available which analyses the relationship of liberalized regime and the level of FDI Stock, to bridge this gap a modest attempt is done in this direction to empirically test this relationship.

SECTION 111: OBJECTIVES OF THE STUDY

The objective of the present study is to evaluate the trends and flows of FDI in India and developed countries, to have a comparative view. To achieve the objective of the paper, the study has been taken

up for the period 1991-2011(post liberalization period).

Hypothesis of the study

- FDI flows have shown a marked rise in the study period in both India and developed countries and liberalised regime has shown a positive impact of total inflows of the economy.
- There exist a significant relationship between OECD FDI Regulatory Restrictive Index and the stock of FDI.

RESEARCH METHODOLOGY

DATA COLLECTION

To achieve the objectives of the study secondary data is used which is collected from various sources i.e. World Investment Reports, publications from Ministry of Commerce, Asian Development Bank's Reports, Reserve Bank of India bulletins, Economic and Social Survey of Asia and the Pacific, United Nations, Asian Development Outlook, Country Reports on Economic Policy and Trade Practice-Bureau of Economic and Business Affairs, U.S. Department of State and from websites of World Bank, IMF,OECD, WTO, RBI, UNCTAD, EXIM Bank etc. Time series data and the relevant data have been collected for the period 1991 to 2011.

SECTION IV: ANALYSIS AND INTERPRETATIONS OF RESULTS

FDI is as an engine of capital, technology, managerial skills, technological progress & capacity, access to foreign markets and in maintaining economic growth and development for developing countries, where as for developed countries it is considered as a tool for accessing the market of emerging economies. It is also considered as tool of filling the savings, foreign exchange reserves, revenue, trade deficit, management and technological gaps. Its impact on economic growth depends on country's domestic policy and foreign policy.

TRENDS AND PATTERNS OF FOREIGN DIRECT INVESTMENT (FDI):

It refers to foreign direct investment. Economic growth has a profound effect on the domestic market as countries with expanding domestic markets should attract higher levels of FDI inflows. There is a clear indication from the data that foreign investors showed keen interest in Indian economy because of liberalised regime pursued and followed by Indian economy. There was a constant upsurge in FDI equity flows reaching the peak in 2008-09, showing a decline in 2010 and 2011 and showing slight signs of recovery in January 2012 taking the cumulative equity inflows of FDI to a record level of 243055 US Dollars. (Figure 1, Table 1).This trend proves that India is now considered a good investment centre which is evidenced from their infusion of investment in Indian economy. There are a number of factors contributing to this contemporary trend with special reference to being its

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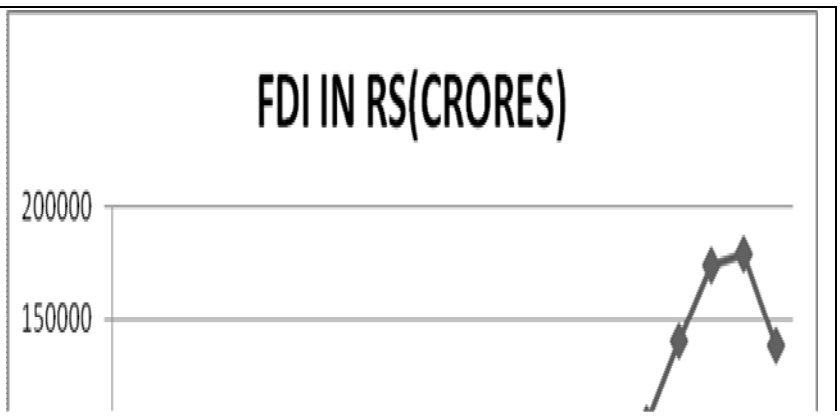
demographics' with a young population there is a huge consumer base that is to be tapped, the growing middle class, increased urbanization and awareness, rising disposable incomes see figure 1 and table 1 . There is fall in the investment in the year 2010-11, for this many global factors are responsible but it will recover very quickly owing to the advantages FDI can give to the emerging economies like India. Now this is showing a clear sign of recovery showing positive global scenario. After a dismal performance in 2010-11, foreign direct investments into India are back on track. "During April and May 2011, FDI flows were up 77 percent from the previous year to $7.8 billion, breaking with the poor performance of last year. This is also corroborated by rising mergers and acquisitions of Indian companies by foreign companies at $23.3 billion in the first half of 2011-12. The government is finally taking steps to relax FDI norms for multi-brand retail. The Committee of Secretaries has recently recommended up to 51 percent foreign investment in the sector and a commitment of at least $100 million investments. If this relaxation in norms finally becomes policy, retailing giants like Wal-Mart and CarreFour will enter this market. When large investments pour in, the general climate for inflows improves". (http://www.firstpost.com).

TABLE 1

YEARS	FDI IN RS(CRORES)
1990-91	174
1991-92	316
1992-93	965
1993-94	1838
1994-95	4126
1995-96	7172
1996-97	10015
1997-98	13220
1998-99	10358
1999-00	9338
2000-01	18406
2001-02	29235
2002-03	24367
2003-04	19860
2004-05	27188
2005-06	39674



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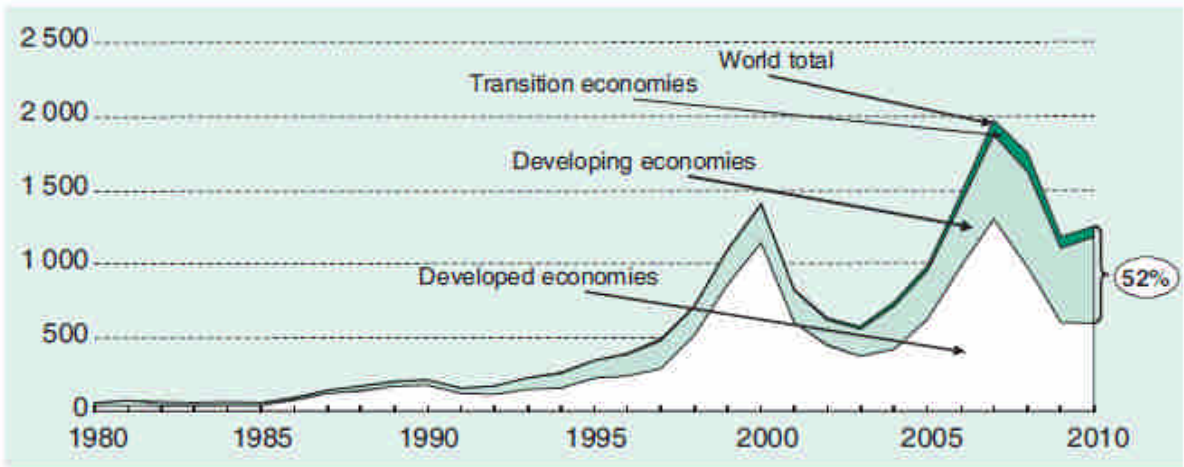
2006-07	**103367**
2007-08	**140180**
2008-09	**173741**
2009-10	**179059**
2010-11	**138462**

Source:Dipp.nic.in

EVALUATION OF GLOBAL FDI:

There is a moderate rise in FDI flows to $1.24 trillion in 2010 which is below 15 per cent below their pre-crisis average. There was an unprecedented rise in FDI of developing and transition economies together attracted more than half of global FDI flows. There was a record level of Outward FDI to these economies reaching at a record level mainly to South. On the contrary there was a continuous fall in FDI inflows to developed countries. Emerging economies emerged as a major recipient of both FDI and as outward investors in 2010. There has been a shift in international production and consumption trends to emerging economies. TNCs are increasingly investing in both efficiency- and market-seeking projects in these emerging economies because of this reason. More than half of global FDI inflows in 2010 were absorbed by these countries. There was also a strong rise in FDI outflows from developing and transition economies, by 21 per cent as is seen in the following figure

Figure I.3. FDI inflows, global and by group of economies, 1980–2010
(Billions of dollars)



Source: UNCTAD, based on annex table I.1 and the FDI/TNC database (www.unctad.org/fdistatistics).

Services FDI subdued Sectoral patterns. FDI in services, which accounted for the bulk of the decline in FDI flows due to the crisis, continued on its downward path in 2010. There was a fall in the share of FDI inflows in this sector. All the main service industries (business services, finance, transport and communications and utilities) fell but at different speeds. The declining trend was sharpest in the financial industry. There is strong interaction of domestic industrial policies with the FDI policy

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nationally and internationally .The challenge is to manage this interaction so that the two policies work together for development of the economy i.e. between building stronger domestic productive capacity on the one hand and avoiding investment and trade protectionism on the other.

The moderate recovery of FDI flows in 2010 revealed an uneven pattern among components and modes of FDI. Cross-border mergers and acquisitions (M&As) rebounded gradually, yet green field projects – which still account for the majority of FDI – fell in number and value. Increased profits of foreign affiliates, especially in developing countries, boosted reinvested earnings – one of the three components of FDI flows – while uncertainties surrounding global currency markets and European sovereign debt resulted in negative intra-company loans and lower levels of equity investment – the other two components of FDI flows. While FDI by private equity firms regained momentum, that from sovereign wealth funds (SWFs) fell considerably in 2010.FDI inward stock rose by 7 per cent in 2010, reaching $19 trillion, on the back of improved performance of global capital markets, higher profitability, and healthy economic growth in developing countries. Majority of FDI – fell in number and value. Increased profits of foreign affiliates, especially in developing countries, boosted reinvested earnings – one of the three components of FDI flows – while uncertainties surrounding global currency markets and European sovereign debt resulted in negative intra-company loans and lower levels of equity investment – the other two components of FDI flows. While FDI by private equity firms regained momentum, that from sovereign wealth funds (SWFs) fell considerably in 2010(http://www.unctad-docs.org).

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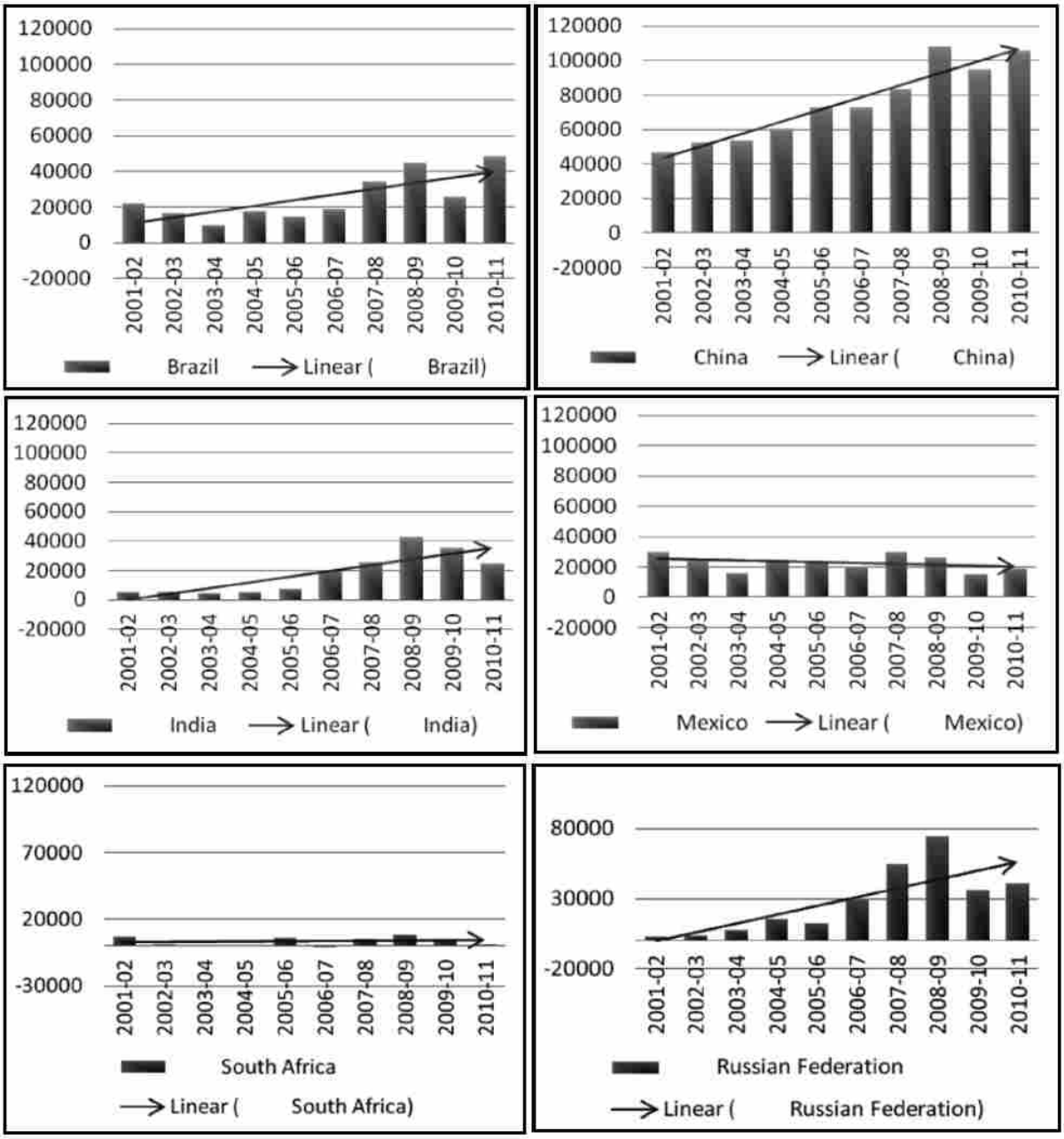
FDI trends in various EME's (Emerging Market Economies) in US $ Millions



Source: UNCTAD

- To analyse and test the hypothesis of relationship between OECD Regulatory Restrictiveness Index and FDI stock let us first define **OECD FDI Regulatory Restrictiveness Index**

OECD FDI Regulatory Restrictiveness Index, A tool for benchmarking countries, measuring reform and assessing its impact. FDI Index measure, statutory restriction, all discriminatory measures affecting foreign investors, including market, access restrictions and departures from national treatment. It does not cover , degree of implementation, Institutional quality .It takes into accounts four types of restrictions namely Sectoral equity limits, Screening restrictions on key personnel: managers, directors and other restrictions: land, reciprocity, capital repatriation, branches, etc. These are weighted in the following ways each restriction is given a score based on an assessment of its importance. Aggregate score is weighted average of

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sectoral scores

FDI Index: data & coverage

OECD countries: information based on reservations under the OECD Code of Liberalisation of Capital Movements and the National Treatment Instrument

Countries adhering to the OECD Declaration on International Investment and Multinational Enterprises • Argentina, Brazil, Egypt, Latvia, Lithuania, Morocco, Peru, Romania •

Other countries currently requesting adherence

Other non-OECD countries (China, India, Indonesia, Russia, Saudi Arabia, South Africa, Ukraine), based on OECD Investment Policy Reviews, national sources, GATS and other international agreements, APEC

Sectors

Agriculture, forestry, fishing

Mining & quarrying

Manufacturing (5 sub-sectors)

Electricity (generation, distribution)

Construction

Distribution (wholesale, retail)

Transport (surface, water, air)

Hotels & restaurants

Information & communication (fixed & mobile telecoms, broadcasting, other media)

Financial services (banking, insurance, other finance)

Professional services (accounting & auditing, legal, architecture, engineering)

Real estate

This index helps in measuring

Relative FDI restrictiveness of each country

changes in restrictiveness over time

A country's performance in attracting FDI for a given level of restrictiveness

the effect of FDI liberalisation on FDI inflows.

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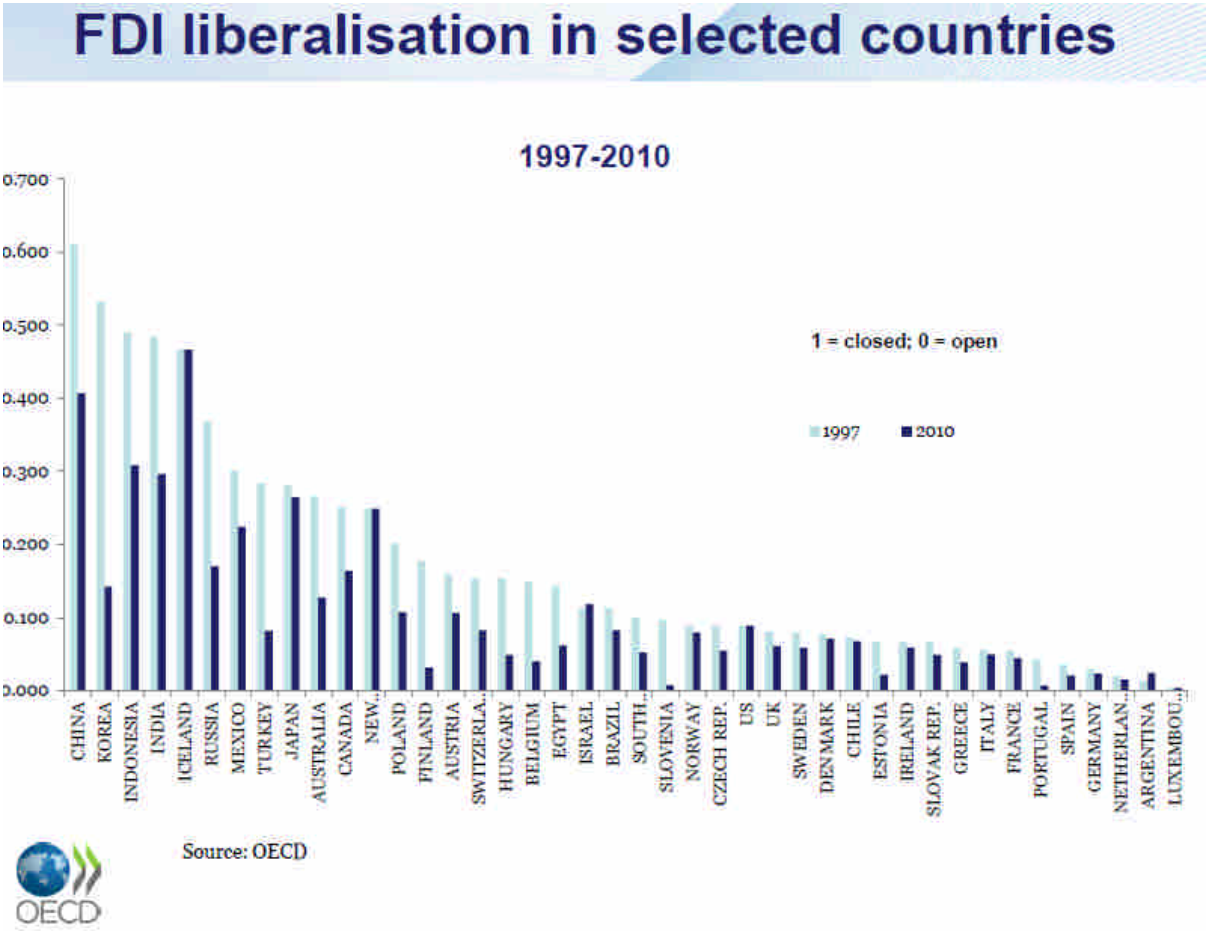

A regression was carried out on 2009 FDI STOCK AND 2010 FDI INDEX ,the relationship was found significant i.e. the economies which are more open receive more FDI investments and vice versa,

	2010 FDI INDEX	**FDI/STOCK 2009**
Argentina	0.025	0.261
Australia	0.128	0.461
Austria	0.106	0.422
Brazil	0.083	0.251
Canada	0.164	0.393
Chile	0.068	0.743
China	0.407	0.200
Czech Republic	0.055	0.661
Denmark	0.072	0.485
Egypt	0.062	0.354
Estonia	0.022	0.823

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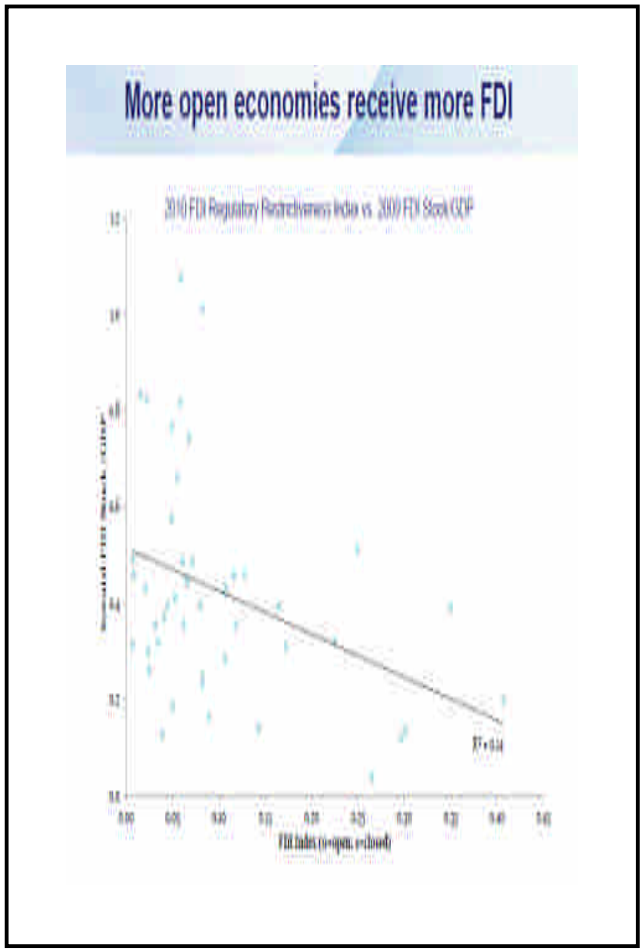
Finland	0.032	0.355
France	0.045	0.396
Germany	0.023	0.300
Greece	0.039	0.128
Hungary	0.049	0.766
India	0.297	0.119
Indonesia	0.308	0.135
Ireland	0.059	1.074
Israel	0.118	0.354
Italy	0.050	0.186
Japan	0.265	0.039
Korea	0.143	0.141
Latvia	0.065	0.448
Lithuania	0.041	0.372
Mexico	0.225	0.320
Morocco	0.067	0.446
Netherlands	0.015	0.832
New Zealand	0.249	0.512
Norway	0.080	0.395
Peru	0.107	0.283
Poland	0.108	0.432
Portugal	0.007	0.493
Romania	0.008	0.459
Russia	0.195	0.310
Saudi Arabia	0.350	0.392
Slovakia	0.049	0.574
Slovenia	0.007	0.314
South Africa	0.052	0.412
Spain	0.021	0.430
Sweden	0.059	0.817
Switzerland	0.083	1.012
Turkey	0.082	0.233
Ukraine	0.116	0.458
UK	0.061	0.487
US	0.089	0.164



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Dependent Variable: FDIINDEX2010
Method: Least Squares
Date: 04/02/12 Time: 17:17
Sample (adjusted): 5 48
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDISTOCK2009	-0.163488	0.059614	-2.742422	0.0089
C	0.175245	0.029185	6.004631	0.0000

R-squared	0.151873	Mean dependent var	0.104682
Adjusted R-squared	0.131679	S.D. dependent var	0.098047
S.E. of regression	0.091364	Akaike info criterion	-1.903542
Sum squared resid	0.350590	Schwarz criterion	-1.822442
Log likelihood	43.87791	F-statistic	7.520880
Durbin-Watson stat	1.680366	Prob(F-statistic)	0.008925

Dependent Variable: FDISTOCK2009
Method: Least Squares
Date: 04/02/12 Time: 17:34
Sample (adjusted): 5 48
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDIINDEX2010	-0.928954	0.338735	-2.742422	0.0089
C	0.528858	0.048325	10.94371	0.0000

R-squared	0.151873	Mean dependent var	0.431614

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Adjusted R-squared	0.131679	S.D. dependent var	0.233716
S.E. of regression	0.217786	Akaike info criterion	-0.166222
Sum squared resid	1.992085	Schwarz criterion	-0.085122
Log likelihood	5.656880	F-statistic	7.520880
Durbin-Watson stat	1.892709	Prob(F-statistic)	0.008925

The regression results are displayed below once taking FDI as dependent and another regression equation by taking fdi index as dependent, both show significant relationship of the two equations, clearly showing if economy is more open with less of restrictions the inflow of FDI will be more and vice-versa. This leads to the acceptance of the hypothesis that there is a significant relationship between Regulatory Restrictive Index and the level of FDI stock.

SECTION V: SUMMARY AND CONCLUSION

FDI is as an engine of capital, technology, managerial skills, technological progress & capacity, access to foreign markets and in maintaining economic growth and development for developing countries, where as for developed countries it is considered as a tool for accessing the market of emerging economies. There is a clear indication from the data that foreign investors showed keen interest in Indian economy because of liberalised regime pursued and followed by Indian economy. There was a constant upsurge in FDI equity flows reaching the peak in 2008-09, showing a decline in 2010 and 2011 and showing slight signs of recovery in January 2012 taking the cumulative equity inflows of FDI to a record level of 243055 US Dollars. There are a number of factors contributing to this contemporary trend with special reference to being its demographics' with a young population there is a huge consumer base that is to be tapped, the growing middle class, increased urbanization and awareness, rising disposable incomes There is fall in the investment in the year 2010-11, for this many global factors are responsible but it will recover very quickly owing to the advantages FDI can give to the emerging economies like India. India is now opening its policies even more to attract the foreign investment inflows .When large investments pour in, the general climate for inflows improves". There is a moderate rise in FDI flows (global view) to $1.24 trillion in 2010 which is below 15 per cent below their pre-crisis average. There was an unprecedented rise in FDI of developing and transition economies together attracted more than half of global FDI flows. There was a record level of Outward FDI to these economies reaching at a record level mainly to South. Emerging economies emerged as a major recipient of both FDI and as outward investors in 2010.There has been a shift in international production and consumption trends to emerging economies. TNCs are increasingly investing in both efficiency- and market-seeking projects in these emerging economies. There is strong interaction of domestic industrial policies with the FDI policy nationally and internationally .To empirically test the relationship of liberalised regime represented by OECD FDI Regulatory Restrictiveness Index and

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the level of FDI Stock regression (OLS) was carried out. Regression results show significant relationship of the equations, clearly showing if economy is more open with less of restrictions the inflow of FDI will be more and vice-versa.

SECTION VI : REFERENCES

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DRIVERS OF MOTIAVTION AND ITS IMPACT ON EMPLOYEES PRODUCTIVITY

A comparative study of Public & Private Universities Teachers KPK Pakistan.

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Abstract

This research examines the relationship of teacher's drivers for motivation and dependency of productivity on motivation. This research is a comparative study of public and private universities teachers in Peshawar region Research analyzed the drivers of motivation of teachers in both sectors and on basis of their motivation how productivity is influenced. Most of the research emphasize that there are certain factors responsible for productivity. But before productivity it is important to create motivation because productivity is strongly depended upon motivation. Results of the study show that productivity of university teachers is strongly dependent upon teacher motivation. While their motivation is positively and strongly dependent upon the factors like Job environment, Salary, Leadership, Stress, Trust/Credibility and Organizational Policies.

Key Words: Motivation, Productivity, Job environment, Salary, Leadership, Stress, Trust/Credibility and Organizational policies.

Introduction

Owais (2011) describe the word motivation is an outcome of *motive,* since this word applies that any need, idea and psychological emotional and natural condition state that quickly forces man to take action. So the satisfaction of need is an outcome of motive. There is a great use of exchangeable use of desire, need and want etc as psychologists have used it regularly. One of the definitions of motivation can be the agreeableness to swell up the energy for attainment of individual and organizational goals or rewards

According to Park (1985) motivation is "a driving force which compels a person to take action." One definition for motivation can be those psychological factors that verify the route of a person's level of

efforts supported by the determination of a person in the face of obstacles. From the direction I mean that a person's behavior reflects the several possibilities of actions in which an individual might engage in while consistency (persistence) refers to the condition in which hurdles and obstacles are faced by an individual keeps trying to get over with it or gives up. The productivity of a person for a particular job is depended upon motivation. Greater the motivation greater the productivity and vise versa.

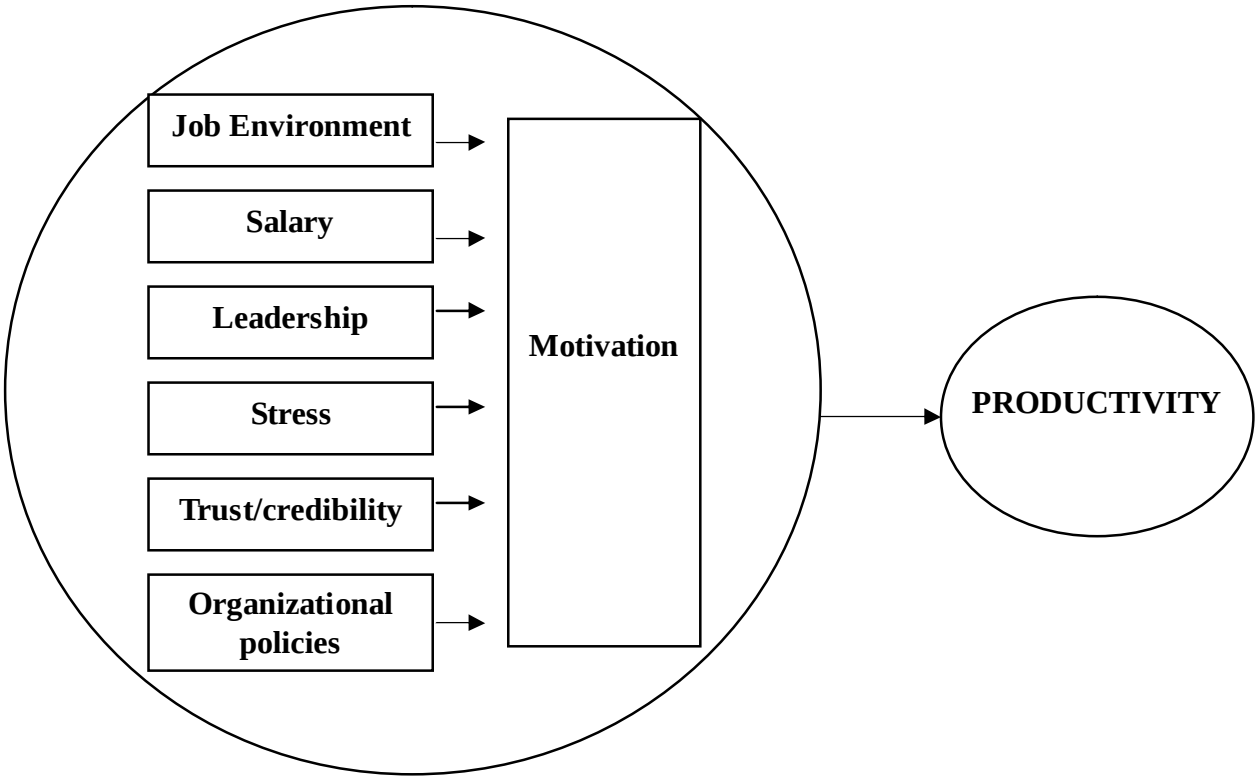
The relationship between job satisfaction and task and contextual performance has gain much acceptance. Researchers have investigated that overall job satisfaction was positively related to task and contextual performance (Edward et al, 2008). The relationship among organizational learning culture job satisfaction and organization commitment has been studied by author. He investigate positive relationship between job satisfaction and organization commitment, and learning organizational culture can be a predictive variable that has strong influence on employee attitude (Kinjerski & Skrypnek, 2008). Researcher examined relationship between trust, organization commitment and turnover intention. They found weak impact of organization commitment and trust on turnover and strong impact of work commitment on turnover. The alterations in variables related to organizations i.e. salary, contribution of employees in developing policies and work environment can be developed to high up the commitment towards organization that might in turn lead to satisfaction and commitment of employees (Hanif and Kamal, 2009). Researcher examined the impact of organizational culture types on job satisfaction. He examined four organizational culture types, adhocracy, clan, hierarchy and market. Job satisfaction was positively related to clan and adhocracy and negatively related to market and hierarchy culture (Lund). The paper investigate the impact of trust and recognition on job satisfaction and motivation, result show that different dimension of work motivation and satisfaction are significantly correlated and trust and recognition that had great impact on motivation of employees (Qaiser & Usman, 2010). According to Ali (2005) there is divine need for the management of the colleges to have a strong focus on four *facets* of job satisfaction like *promotion, pay, contingent rewards* and associated fringe benefits to add to the satisfaction level of lecturers at college level and decrease the *turnover intention*. Karimi (2006) has spotted that one of the most important feature of motivation is the *work itself* while the situation of work has proved to be the lowest factor of motivation for faculty members. The framework of job has added least to the satisfaction of faculty while the *content* of job has added more satisfaction to the faculty. The characteristics related to motivation of job and hygiene has been found to have considerable relation to the satisfaction with job as a whole.

A satisfied employee is a *productive employee*. Since many people in shape of employees use up most of their time of their lives at work place. So work place satisfaction is also one of the major contributor towards job satisfaction of employees. According to Velnampy (2004) *Job attitude* and *employee performance* of public sectors organizations reported that job satisfaction has affected employee performance from future perspective through involving their selves in job, since satisfaction and commitment is an outcome of high performance on the job as well. Therefore the management of the organization desiring to create greater level of job satisfaction to built teamwork and loyalty between employees. Only compensation is not of greater importance for retaining employees and made them feel like home teamwork is also one of the significant aspect that has affected job satisfaction in which high importance is give to the *autonomy of job in* addition to the behavior of leaders. Talking about gender the results above has clearly stated that, female job satisfaction differs in comparison to male job satisfaction. Researcher studied that pay is positively associated with increased job satisfaction (Artz 2006). Organizational performance from the perspective of satisfaction with job, salary and in the context of *job satisfaction, pay satisfaction and trust in management and peer*s that leads to the commitment for organization like an antecedent of organizational performance. The inclination towards work environment can be measured by the use of three dimensional framework of work environment setting like *system maintenance, goal orientation and relationship dimensions*. Mentioning from the perspective of corporate level, the growth and efficiency in shape of productivity

has been affected by affected by several actors like human resource employed, the use of technology the goals that organization want to achieve but the most important factor is stress. Stress on employees has led to de motivated workforce that has ultimately affected the productivity of the organization. It also depends upon the physical environment and its affect on health and employees' performance (Billings & Moos, 2000). The trust from manager and supervisors towards their employees had positive effect on the citizenship behavior of nurses (Baykal & Altuntas 2009). Leader Member Exchange (LMX) relationship had significant effect on Citizenship Behavior (Kanika 2006). In the study procedural justice fully mediated the relationship between Perceived Contribution of LMX and OCB. Talking about the justice dimensions procedural justice and interactional justice had significant mediation effect between Perceived contribution to LMX and OCB while Distributive Justice did not. The reason for the absence of relationship between OCB and LMX is that the diversity of employee skills as it becomes almost impossible to treat all of them equally. Organizational Citizenship Behavior was positively affected by collectivism and Trust also had positive Impact on OCB (Wang 2007). The employees who have shown citizenship behavior, they have experienced great success through their careers. The relationship of Trust and Collectivism was also positive with Organizational Citizenship Behavior. There was positive relationship with the survivor's of merger hope and trust with the normative commitment. There was no significant relationship found between the survivors' hope and trust with the continuance commitment Ozag (2006).

Theoretical Frame work of the study

There are two variables discussed in this study, i.e. independent and dependent variables. The below figure shows that productivity depends upon Motivation. While Motivation depends upon Job environment, Salary, Leadership, Stress, Trust/Credibility and Organizational policies. so it important to fine the impact of motivation on productivity and motivation dependency on other six variables as shown in below figure.



Research Framework of the Study

Reliability

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To find the reliability of the research instrument a scale reliability test has been calculated.

Table 1 Reliability of the Scale of the study			
S.No	**Variables**	**PUBLIC UNIVERSITIES**	**PRIVATE UNIVERSITIES**
		Cronbach's Alpha	**Cronbach's Alpha**
1	Productivity	0.721	0.709
2	Motivation	0.777	0.871
3	Job environment	0.960	0.911
4	Salary	0.954	0.901
5	Leadership	0.830	0.812
6	Stress	0.831	0.866
7	Trust/Credibility	0.939	0.901
8	Organizational Philosophy	0.944	0.979

A pilot study is also conducted on city university teachers to fine the accuracy of research instrument. After distributing 160 questionnaires among teachers of public and private universities in KPK Pakistan. The Cronbach's Alpha for variables are as below in table 1.

The research instrument in shape of questionnaire was well established but for conformity reliability has been calculated to carry study towards analysis.

CORRELATION ANALYSIS

To find the relationship between dependent and independent variables correlation analysis has been calculated. Table 2 below show different results of the study.

Table 2 Correlation Analysis for Variables of the study.						
S.No	**Dependent Variables**	**Independent variable**	**PUBLIC UNIVERSITIES**		**PRIVATE UNIVERSITIES**	
			R	**R Square**	**R**	**R Square**
1	Productivity	Motivation	0.911	0.	0.978	0.956
2	Motivation	Job environment	0.681	0.463	0.642	0.412
3	Motivation	Salary	0.757	0.573	0.733	0.537
4	Motivation	Leadership	0.713	0.508	0.679	0.461
5	Motivation	Stress	0.651	0.423	0.813	0.660
6	Motivation	Trust/Credibility	0.557	0.310	0.721	0.519
7	Motivation	Organizational policies	0.765	0.585	0.644	0.414

As shown in table 2, there is a strong association between productivity and motivation with correlation coefficient (r = .911 Public) and (r = .978 Private) which mean that motivation has a significant impact on productivity of teachers both at public and private universities.

Survey demonstrate that there is a moderate relationship between motivation and job enviornment with correlation coefficient (r = .681 Public) and (r = .642 Private). Result of the study shows that there is a strong relationship between motivation and salary with correlation coefficient (r = .757 Public) and (r = .733 Private). Which mean that on basis of salary public universities teachers are more motivated in comparison of private teachers. Finding of the study shows that there is a strong relationship between

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motivation and leadership with correlation coefficient (r = .713 Public) and (r = .679 Private). Which mean leadership styles has more influence on public university teacher motivation in comparison of private universities teachers. Survey demonstrate that there is a moderate relationship between motivation and stress with correlation coefficient (r = .651 Public) and (r = .813 Private).which mean that stress factor is more causing motivation of private university teachers in comparison of public universities teachers. Results of the study demonstrate that there is a moderate relationship between motivation and trust with correlation coefficient (r = .557 Public) and (r = .721 Private). Which mean that trust and credibility has more influence on private universities teachers in comparison of public universities teachers. Survey demonstrate that there is a strong relationship between motivation and organizational philosophy with correlation coefficient (r = .765 Public) and (r = .644 Private). Which mean that in comparison of private university teachers motivation, public universities teachers motivation is more influenced by organizational policies.

Hypotheses and Regression Equations of the study

Following are the hypotheses related to the relationship transactional, relational and turnover intention the following hypothesis has been generated.

H.1. Motivation and productivity has a strong relationship with each other.

H. 2. Motivation depends upon job satisfaction of an employee.

H.3. Salary increases the motivation of employee.

H.4. Leadership style and motivation has a significant relationship.

H.5. Stress has a significant impact on employee motivation.

H.6. There is a significant relationship between trust and motivation of an employee.

H.7. Organizational policies have an impact on employee motivation.

Table 3 shows that the overall model is highly significant (P= 0.000). Which mean that there is a significant relationships exist between Motivation and Productivity in public university teachers (t-statistic = 29.433 and P-value= 0.00) which mean that motivation has a significant impact on productivity of public universities teachers.

Table 3 Regression Results for Variables of the study.

S. No	Dependent Variables	Independent variable	Adjusted R square	F	B	St. Error	T	P. Value
1	Productivity (Public)	Motivation (Public)	0.493	0.128	0.788	0.276	29.433	0.000
2	Productivity (Private)	Motivation (Private)	0.341	0.894	0.217	0.316	47.821	0.000

In case of private universities teachers there is a significant relationship exist between motivation and productivity (t-statistic = 47.821 and P-value= 0.000). Which mean that motivation has a significant impact on private university teachers' productivity.

As Shown in table 4 below that over all model is highly significant (P= 0.000). All the six variables

have a significant relationship with motivation both in public and private sector universities.

Table 4 Regression Results for Variables of the study.

PUBLIC UNIVERSITIES								
S. No	**Dependent Variables**	**Independent variable**	**Adjusted R square**	**F**	**B**	**St. Error**	**T**	**P. Value**
1	Motivation	Job environment	0.69	17.611	0.231	0.250	22.343	0.000
2	Motivation	Salary	0.38	8.296	0.419	0.293	20.922	0.000
3	Motivation	Leadership	0.26	4.231	0.332	0.244	18.833	0.000
4	Motivation	Stress	0.52	7.116	0.713	0.285	39.149	0.000
5	Motivation	Trust/Credibility	0.31	17.211	0.927	0.315	22.329	0.000
6	Motivation	Organizational policies	0.46	16.931	0.514	0.123	42.176	0.000
PRIVATE UNIVERSITIES								
1	Motivation	Job environment	0.45	0.118	0.861	0.250	43.211	0.000
2	Motivation	Salary	0.61	0.849	0.270	0.293	35.127	0.000
3	Motivation	Leadership	0.78	3.360	0.448	0.244	13.258	0.000
4	Motivation	Stress	0.59	9.913	0.897	0.285	52.147	0.000
5	Motivation	Trust/Credibility	0.53	11.801	0.048	0.315	21.364	0.000
6	Motivation	Organizational policies	0.63	17.439	0.514	0.123	26.219	0.000

Table 4 shows that there exists a significant relationship between job environment and motivation in public university teachers (t-statistic = 22.343 and P-value= 0.000) which means that job environment has a significant impact on motivation of public universities teachers. Results show that there exist a significant relationship between salary and motivation (t-statistic = 20.922 and P-value= 0.000). Findings of the study describes that there is a relationship between leadership and motivation (t-statistic = 18.833 and P-value= 0.000). Results indicate that stress has an impact on motivation in public sector universities teachers (t-statistic = 39.149 and P-value= 0.000). The public sector university teachers' motivation is affected with trust and credibility (t-statistic = 22.329 and P-value= 0.000). Organizational policies also have an impact on teachers motivation in public sector universities (t-statistic = 42.176 and P-value= 0.000). Hence it applies that motivation of teachers in public sector universities is influenced by organizational policies.

In case of private university teachers there is a significant relationship exist between job environment and motivation in private university teachers (t-statistic = 43.211 and P-value= 0.000) which mean that job environment has a significant impact on motivation of private university teachers. Results show that there is a significant relationship between salary and motivation (t-statistic = 35.127 and P-value= 0.000). Findings of the study describe that there is a relationship between leadership and motivation (t-statistic = 13.258 and P-value= 0.000). Results show that stress has an impact on motivation in private sector university teachers (t-statistic = 52.147 and P-value= 0.000). The private sector university teachers motivation has been affected by trust and credibility (t-statistic = 21.364 and P-value= 0.000). Organizational policies also has an impact on teachers motivation in private sector universities (t-statistic = 26.219 and P-value= 0.00). Which mean that motivation of teachers in private sector is strongly influenced by organizational policies.

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Conclusion

Findings of the study show that motivation is strongly associated with the productivity of employees as in this case from the perspective of university teachers of public and private sector. Since motivation was measured by six factors. Hence the results show that on individual basis job environment, salary, leadership, stress, trust/credibility and organizational philosophy has been found to have significant relationship with motivation for both public and private sector universities of Peshawar (Khyber Pkhtoonkhwah). In short the study has provided strong evidence that motivated staff specifically from university level perspective both in public and private sectors has strongly affected the productivity of these employees, highly motivated university teachers in public and private sectors have shown greater productivity.

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IT Resources and the Strategic Conditions to Maintain Sustainable Competitive Advantage

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Abstract

There are many studies that attempt to investigate the influence of IT resources on the firm's performance. However, there is scarcity in research that explores the necessary strategic conditions that allow IT resources to facilitate sustainable competitive advantage (SCA). Therefore, based on the literature of resource-based view (RBV), the objective of this theoretical paper is to remedy this gap. The findings indicate that IT resources need the following four conditions in order to be able to facilitate SCA: (1) IT resources should support and be supported by the corporate strategy, (2) IT resources should enable information systems application strategy, (3) Alignment mechanism is essential to maintain SCA, and (4) IT resources should be supported by top management commitment. This paper contributes to research and practice by enhancing the RBV by including the necessary conditions to maintain SCA. Therefore, this investigation will expand the researchers' mindset to include not only IT resources but also the required conditions when thinking of maintaining SCA, and offer practitioners a greater chance of gaining SCA.

Keywords: Resource-based view, strategic alignment, sustainable competitive advantage.

1. Introduction

Organizations want not only to gain competitive advantages, but also want these advantages to last for the longest possible time. Many IT applications offer the possibility for competitive advantage, however, over time competitors will be able to imitate these applications; they become a prerequisite for doing business, and the competitive advantage only lasts a short time. Some IT applications may provide only limited advantages to the first movers before competitors copy these applications (Vitale, 1986). Many competitors are not only imitating the applications, but also hire the same contractors and outsource to the same vendors (Ross et al., 1996). Nevertheless, many firms like Wal-Mart and Federal Express have established that the ability "to apply IT to business opportunities" enhances their competitiveness (Ross et al., 1996). These firms have the ability to apply IT applications for continually changing business opportunities.

Competitive advantage is defined as gaining a return-on-investment (ROI) above the industry average (Porter, 1985). According to Barney (2012), a competitive advantage is implementing an effective strategy not "simultaneously" implemented by current or future competitors. Sustained competitive advantage is implementing an effective strategy not "simultaneously" implemented by current of future competitors and those competitors being unable to "duplicate" the advantages of this strategy. "A competitive advantage is sustained only if it continuous to exist after efforts to duplicate the advantage have ceased" (Barney, 1991). Most innovative application of IT will turn to strategic necessities that most companies need to have, and in rare conditions the innovative application will be SCA. Strategic necessity is the IT investment that is implemented not for competitive advantage but because it becomes an important part of doing business.

There are many studies that attempted to link IT resources and the firm's performance. Ross et al., (1996)

suggested that the combination of three IT assets, namely IT human resources, technology base, and relationship, determine the quality of IT delivery, development, and support processes. They argued that the difference is not in the technologies itself but in these three IT assets and how they are implemented in the firm. Clemons and Row (1991) developed a resource-based theory arguing that differences in strategic resources among firms to develop IT innovation are important to maintain sustainable competitive advantage (SCA). They proposed the "strategic necessity" hypothesis which means IT alone cannot lead to SCA; however it may assist other resources to acquire SCA. Neo (1988) asserted that "existing systems" are important for implementing IT for competitive intentions. Many studies show that IT has a positive impact on acquiring competitive advantage (Chao, C. and Chandra, 2012; N'Da et al., 2009; Kettinger et al., 1994; Feeny and Ives 1990; Clemons and Weber, 1990; Li and Ye, 1999).

Literature shows that IT resources alone are not likely to achieve SCA. Thus, in order for IT resources to help gaining and maintaining SCA, certain strategic conditions should be satisfied. Although there are many studies that investigate the influence of IT resources on competitive advantage, there is scarcity in research that explores the strategic conditions that allow IT resources to facilitate SCA. Therefore, the objective of this paper is to remedy this gap. This objective is achieved by exploring the related literature of the resource-based view (RBV). By extending the RBV theory by including several strategic conditions, the contribution of this paper is expanding the researchers' mindset to include not only IT resources but also the required strategic conditions when thinking of maintaining SCA, and offering practitioners a greater chance of gaining SCA.

The rest of this paper is arranged as follows. Section 2 is an overview of RBV. In section 3, we explore the strategic conditions for IT resources to maintain SCA; and finally we conclude in section 4 with a summary and future research direction.

2. Overview of Resource-Based View

The focus of RBV is resources. Resources include everything in the organization that benefit both the customers and the organization. One classification of resources is tangible and intangible resources. These resources include communication within an organization, and manager's skills (Waserman et al., 1999). Another classification is human resources (e.g. chief executive commitment), business resources (e.g. suppliers relationships), and IT resources (computer hardware) (Thomas and Anne, 1997). Clemons and Row (1991) defined resources as "any long-lived productive capability" which includes tangible assets such as databases and hardware, and intangible assets such as IT skills, patents, and managerial expertise.

In fact, firms consist of different types of resources such as business and technical resources. In order for these resources to lead to a competitive advantage, they should possess unique characteristics, in which case they become strategic resources. These strategic resources are also called "distinctive competence" (Hayes and Wheelright, 1984), "competitive advantage" (Porter and Millar, 1985), "asset stock accumulation" (Dierickx and Cool, 1989), "capabilities" (Stalk et al., 1992), and "core capabilities" (Clark et al., 1994).

In order to understand these resources, we need to understand their unique characteristics. For example Barney

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(1991) listed four of them: rareness, value, non-substitutability, and inimitability. Rareness and heterogeneity mean that strategic resources are not the same among firms but are unique. A unique IT resource is a prospective source of competitive advantage and firms need to build their strategies around these unique capabilities. As Clemon and Row (1991) argue, "Information technology can lead to sustainable competitive advantage when it is used to leverage differences in strategic resources". Valuable resources are valuable when they help in implementing strategies that improve the firm's efficiency. Non-substitutability means that the resource should have no substitute in order to lead to SCA. If there is any other resource that may lead to the same strategy, the first resource loses its ability to lead to SCA. Immobility (inimitability) means these differences among resources should last for a long time; if the resources are mobile, then competitors can easily acquire them. SCA cannot be obtained when strategic resources are evenly distributed (homogeneity) across competing firms or are highly mobile (Barney, 1991).

For example, technological applications, such as knowledge bases, and inventory applications, all provide future opportunities; these applications might not be unique and they are easy to copy, but at the same time these applications might rely on a unique infrastructure that competitors will be at a cost disadvantage when imitating such infrastructure (immobility). Thus a follower can copy the application of the first-mover, but will not be able to copy the original distinction that the system relies on for success (Feeny and Ives, 1990). According to Mata et al., (1995), "if a firm without a resource or capability does face a cost disadvantage in obtaining, developing, and using it compared to a firm that already possesses that resource (i.e., resource immobility), then the firm that already possesses that resource can have a sustained competitive advantage". In fact, if this differentiation of the infrastructure is really a unique advantage, it would be very hard for a competitor to challenge. Resources uniqueness is not only critical, but also a firm's structure uniqueness is important as Clemons and Row (1987) argued that the advantage of the application comes from "unique structural characteristics of the innovating firm".

RBV shows that having IT resources that possess unique characteristics (e.g. rareness, value, non-substitutability, and inimitability) may lead to competitive advantage; however, this advantage may not be sustainable. Depending alone on the unique characteristics of IT resources is not likely to generate SCA. Certain strategic conditions should exist to interact with characteristics of IT resources to raise the opportunity of achieving SCA.

3. Exploring the Strategic Conditions for IT Resources to Maintain SCA

Some researchers found that IT management is the important key to get SCA. For example, Ray et al. (2001) found that managerial IT skills improved performance of customer service; Mata et al. (1995) adopted resource-based theory to explore whether IT can lead to SCA, and if so, how this can be done. After discussing the theory assertions, the relationship between SCA and the five IT attributes: customer switching costs, access to capital, proprietary technology, technical IT skills, and managerial skills; the authors concluded that only managerial IT skills are likely to lead to SCA. In addition, Pereira (1999) tried to explore whether enterprise resource planning (ERP) technology provides SCA. He found that ERP could lead to SCA if high management skill is applied.

Implementing ERP is not enough; changing the organizational culture toward teamwork, and changing business processes to fit ERP capabilities are required. Also, Waserman et al. (1999) examined the source of competitive advantage from an across-functional perspective; they argued that high performance results from well-managed organizational capabilities include tangible assets and intangible assets.

Therefore, IT should be used to support a firm's objectives, for example IT can be used to meet internal and

external customers' business objectives. As Thomas and Anne (1997) suggested, IT affects a firm's strategies that have IT implications. Much IT research seems to support a strong relationship between IT and a firm's strategies and that firms should integrate strategic power with IT capabilities (Beath and Ives 1986). There seems to be a general consensus that firms should integrate IT with overall strategic planning efforts (e.g. Bakos and Treacy, 1986; Beath and Ives, 1986; Clemons and Row, 1991; Holland et al., 1992). Thus, the first strategic condition can be stated as follows:

Strategic condition 1: IT resources should support and be supported by the corporate strategy

IT is an important component of a firm's strategy. According to Porter and Millar (1985), in order to have a competitive advantage, there are three generic competitive strategies: cost leadership, differentiation, and focus. Other researchers expanded these three to include more strategies; for example, Barney (1997) noted that IT resources might be used to implement different types of strategies such as cost leadership, product differentiation, vertical integration, and strategic alliance strategies. If these resources are heterogeneous and immobile among competing firms, these resources have the potential for SCA. IT resources might have the ability to enable a unique strategy to lead to SCA. IT can be used to develop product quality, improve customer service, or decrease costs (Clemons and Row, 1991).

A clear example for cost leadership strategy is Wal-Mart; careful management of inventory systems at Wal-Mart led to minimizing storage costs. A company may apply a differentiation strategy by offering unique products or services that are valued by its customers. Again, IT resources make this possible and thus can enable this strategy to acquire SCA. For example, FedEx gained competitive advantage from its competitors by a differentiation strategy. As Keller et al. (2002) noted, "This type of differentiation would be supported by FedEx's heavily promoted tracking capabilities, which distinguish it not only from fax and e-mail, but from other overnight delivery carriers as well". As a general example, e-commerce firms seek to sustain competitive advantage by implementing one or more of Porter's strategies (Lumpkin et al., 2002); the authors noted that, "the Internet offers overall cost leaders new ability to reduce costs in primary activities such as marketing and support activities such as purchasing"; the authors gave a differentiation example from Dell Computer Corporation; Dell allows customers to configure their own computers according to their own specifications. Finally, a focus strategy is implemented when the firm is focusing on a particular geographic market, product

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line, or group of customers. By implementing a focus strategy, the Internet has opened new markets for small firms to compete. Therefore, the second strategic condition can be summarized as follows:

Strategic condition 2: IT resources should enable information systems application strategy

On the other hand, IS alignment is the bridge that links the IS view to different views in the organization and its environment (Avial et al., 2009). Alignment is one of the important factors that assist the recognition of strategic IT application (Neo, 1988). The corporate strategic vision should be aligned with the IS strategic vision and the IT products and services need to be aligned with the firm's strategic objectives. Business and IT integration is very important for firms to accomplish their competitiveness (Wegmann, 2003). Firms need to have functional integration at the internal level and external levels. Strategic fit should be maintained between internal IS application strategy and external IT infrastructure, and between internal corporate strategy and external business strategy. As Clemons (1986) suggests, consistency between IS management and strategic planning is important not only for selecting the IT opportunities, but also for protecting these opportunities. IS scope and governance should be consistent with business scope and governance. This consistency should be at all organization levels: top management, middle management, and lower IS management. Top management, for example, provides the required long-term and strategic planning; middle management understands customer requirements and company opportunities; IS management understands the current IT resources, and its competences that are already in place. By doing so, IT applications will allow top-managers to discover and implement opportunities to react to strategic needs better, faster, and cheaper than their competitors. Accordingly, the third strategic condition is summarized in the following sentence:

Strategic condition 3: Alignment mechanism, that includes functional integration between internal and

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external levels, and strategic fit between applications strategy and IT infrastructure, is essential to maintain SCA

Top-management needs to be involved in "establishing IT priorities". This is why many firms are forming teams of senior managers to act as "IT steering committees" which articulate organizational strategies at the corporate/business level and specify how IT supports them. Henderson and Venkatraman (1999) noted the strong relationship between chief executive officer (CEO) commitment and successful IT implementation. CEOs need to support the need of IT, and have their IT vision enter into the organization's strategy. Neo (1988) reported the "management vision and support" as a factor that differentiates between successful IT implementations and unsuccessful IT implementations. Benjamin et al. (1984) talked about the concept of the "senior management entrepreneur" who deals with IT as the heart of business thinking; these managers want to know how the firms' strategic decisions are affected by IT. For example, top management support makes the required IT resources available for implementation. Integrating IT strategy with business strategy and process becomes easier. In addition, there will be guaranteed IT investment over time (Kettinger et al., 1994). Without top management support, important projects may fail. For example, in 1992, Eastman Kodak had decided to implement SAP for its global operations and financial management; the project was discontinued after two years; "key manager, including the chief financial officer, never fully supported the project" (Pereira, 1999). Consequently, the fourth strategic condition is summarized as follows:

Strategic condition 4: IT resources should be supported by top management commitment

From the above discussion, we conclude that corporate strategy, IS strategy, alignment mechanism, and top management commitment are the strategic conditions that can allow IT resources to gain and maintain SCA. Figure 1 summarizes the findings.

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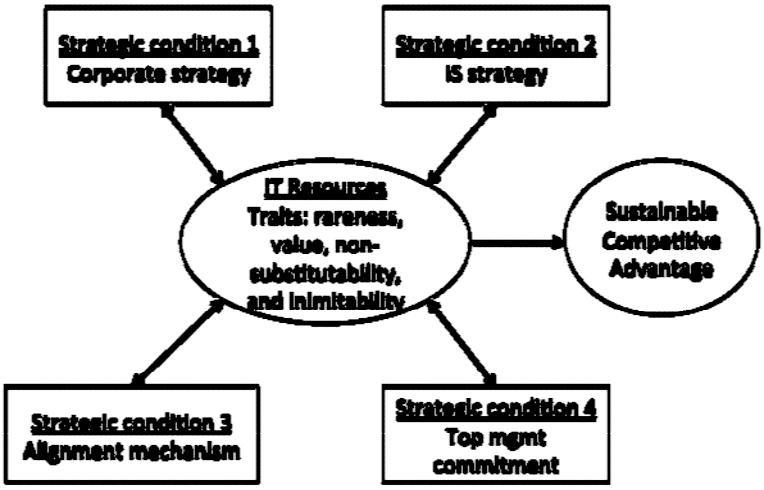

Figure 1: The strategic conditions for IT resources to maintain SCA

4. Conclusion

Having IT resources that possess unique characteristics is not likely to generate sustainable competitive advantage. Four strategic conditions, in addition to the unique IT resources, should be available to have a chance of gaining and maintaining SCA. First, the strategic IT resources should enable important business strategies to acquire SCA by making appropriate IS application strategies possible. Second, IT resources need to support and be supported by corporate strategy. In addition, IT resources need to enable IS strategy. In order to guarantee consistency between business and IS strategies, functional integration is required between internal IS application strategy and corporate strategy. Moreover, strategic fit is also needed between internal IS application strategy and external IT infrastructure, and between business and corporate strategy.

This paper contributes to research and practice by enhancing the RBV by including the necessary conditions to maintain SCA. Therefore, this investigation will expand the researchers' mindset to include not only IT resources but also the required conditions when thinking of maintaining SCA, and offer practitioners a greater chance of gaining SCA. Since this paper is based mainly on literature, the scope of the future research can be empirically validating the findings of this research. In a case study context, for instance, the individual and the accumulative influence of the strategic conditions on IT resources as well as on gaining SCA can be evaluated.

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A calibrated hybrid for the single machine scheduling problem with objective of minimizing total weighted tardiness with dependent setup

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Abstract:

This paper tackles single machine scheduling problem with dependent setup time with objective of minimizing total weighted tardiness in which a hybrid algorithms is investigated to solve the problem based on Genetic Algorithm (GA) and Simulation Annealing (SA) methods. Because of high sensitivity of GA to initial values of its parameters a regression model is developed to identify the impressive factors on its function and calibrate parameters by changing the factors.
Finally a software code that generates the optimal solution is used to check the verification of proposed approaches.

Keywords: *scheduling; single machine; total weighted tardiness; hybrid algorithm; genetic algorithm calibration*

1-introduction

In this paper the problem of sequencing of *N* jobs on a single machine with dependent setup time is considered and the aim is finding a schedule of jobs that minimizes total weighted tardiness. This problem is denoted as $1/s_{ij}/\sum w_i T_i$ in literature.
Lawler [14] showed that the problem of total tardiness even without setup time is NP-hard. So, it can't be solved in reasonable time using common optimizing algorithms.
Generally, there are two class of heuristics have been used to solve the problems of tardiness and lateness: one is constructive and the other is improvement methods.
Constructive methods include static and dynamic ones use some priori rules like SPT and EDD in order to generate a near optimal solution.
Lee et al [15] offered a constructive for minimizing total weighted tardiness that was named ATCS and had a reasonable run time, but its efficiency was not desirable especially for large scale of jobs.
On the other hand, improvement methods try to improve the value of objective function using some heuristics. Holsenback [11] presented an improvement algorithm for minimizing weighted tardiness and solved the problem for 50 jobs. Feo [9] used greedy method and considered the distinct penalty for any lateness and Valente [21] offered a new beam search for the problem of total weighted tardiness that its efficiency and its run time was very ideal for low and medium numbers of jobs.
Sen et al [18] studied about the importance of weight factor and showed that it increases the complexity of problem exponentially.
Cicirello [7] accomplished a comprehensive research in field of tardiness problem and solved it using four different heuristics for 60 jobs. Another research is related to Tan et al [19] that solved the problem o total tardiness without weight factor using SA, Genetic search, Branch and Bound and a new heuristic method. According to their results, Branch and Bound could reach the global optima, but was not desirable for more 25 jobs because of increasing the run time. On other hand, Genetic search could be efficient for great value of jobs.
Khorshidian et al [13] studied the single machine scheduling problem in which the preemption and machine idle time was allowed and presented a model for minimizing the tardiness and earliness

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simultaneously. They showed the proposed model was a NP-hard one and modified a Genetic algorithm for solving it.
Allahverdi [1] compared the dependent and independent setup time consideration and concluded that although dependent setup time can liken the problem to real industry, but it causes to more additional computations in solving process.
Lue and Chu [16] presented a Branch and Bound for minimizing the maximum lateness that generated the upper and lower bounds using some priori rules.
In recent years, some meta-heuristics are presented for tardiness problem. Tasgetiren et al [20] offered a new algorithm that was Discrete Differential Evolution and its function was like to greedy approach. Der Chou [8] presented an experienced learning genetic algorithm for the problem without setup time and compared their results with popular J.E Beasley's OR library. Anghinolfi and paolucci [3] offered a discrete PSO and finally, a Memetic algorithm was investigated by Franka et al [10].
Generally the hybrids that have been used in literature of scheduling can be classified in two groups include low and high level hybrids.
In Low level hybrids first, one heuristic or meta-heuristic method generates the initial solution and the other algorithm tries to reform the solution of objective function. In other words, a algorithm is replaced by initial method, but High level hybrids performs based on only one algorithm and the other methods are used for searching the neighborhood solutions without any changes on basic algorithm parameters. M'Hallah [17] presented sets of high and low level hybrids using dispatching rules, hill climbing, simulation annealing and an evolutionary algorithm based GA in the problem of minimizing total tardiness. Almeida and Centeno [2] offered a compound algorithm using Tabu search, SA and Hill climbing to minimize total tardiness and Cheng et al [6] presented a hybrid based ant colony and four elimination rules that was known as a high level hybrid.
GA is a very suitable Meta heuristic that has wide applications to solve the optimization problems. But its sensitiveness to the initial values of parameters has a very important role in the function of algorithm and with undesirable parameters the algorithm may be trapped in to local optimums. In literature of single machine scheduling the calibration of GA is often accomplished by experiments and based on best our knowledge there are few papers in this field of scheduling problems. Bahalke et al [5] used a design of experiment (DOE) approach for this reason. They considered four impressive factors on GA included the type of investigated mutation operator, type of cross over operator, population size of each generation and a restarting criterion that was defined for improving the efficiency of algorithm. They also considered the interactions between the defined factors.
In this paper we develop a regression model that not only can consider the interactions, but also can determine the effect of each factor on function of algorithm numerically.
We also offer a hybrid based on GA and SA methods to generate the near optimum solution. The proposed hybrids are firstly used for solving the problem with setup time and weight factor in problem of single machine scheduling. The remaining sections of this paper are as follows:
In section 2, the problem is defined. In section 3, the solution methods are illustrated and finally the computational results are presented in section 4. In order to check the verification of proposed methods some statistical tests are accomplished. On other hand the global optima solutions for some data sets of problem are presented using a software code that searches all the solution space of the problem and the solutions of hybrid is compared to it.

2- Problem formulation

In this paper the single machine scheduling problem with N jobs with sequence dependent setup times is considered. The machine works with no idle and all the jobs are ready for processing at time zero. We aim to find a sequence of jobs that minimizes the total weighted of tardiness.
The variables and parameters of problem are defined as follows:

N	Number of jobs are ready to scheduled
p_i	The processing time of ith job
w_i	The weight factor of ith job
T_i	The tardiness of ith job

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c_i	The completion time of ith job
d_i	The due date of ith job
s_{ij}	The setup time of job j when is processed exactly after job i

The basic model of the problem is as below:

$$Min \sum_{i=1}^{n} (W_i T_i) \quad (1)$$

St:

$$\sum_j x_{ij} = 1 \quad (2)$$

$$c_0 = 0 \quad (4)$$

$$C_j \geq C_{j-1} + p_j + \sum_i \sum_{h \neq i} x_{ij} x_{h,j-1} S_{h,i} \quad (5)$$

$$T_i \geq \sum_{j=1}^{n} c_j x_{ij} - d_i \quad \forall i \quad (6)$$

$$T_i \geq 0 \quad \forall i \quad (7)$$

Where decision variables are as follows:

$$x_{ij} = \begin{cases} 1 & \text{If job i is executed in priority j} \\ 0 & \text{Otherwise} \end{cases}$$

Equation (1) introduces the objective function and tries to find a schedule of jobs that can minimize the value of total weighted tardiness. Constraint (2) states that in each priority just one job could be planned. Constraint (3) assures that each job lies just in one priority. Constraint (4) mentions that machine is available from time zero. Constraint (5) declares that in any sequence, the completion time of proceed job is grater or equal to the sum of completion time of prior job, the processing times of scheduled proceed jobs and the setup times between them. Constraint (6) demonstrates the computation of tardiness and finally constraint (7) states that the tardiness has a positive value.

3- Solution method

3-1. Genetic Algorithm

This algorithm firstly presented by Holland at University of Michigan and is one of the most powerful Meta heuristics that can be used as a useful tool to solving many optimization problems. The main idea of this approach is to use of natural genetic concepts and try to code the optimization problem using chromosomes and gens.

The fitness function is also described as below for each sequence:

$$f(i) = \frac{1}{\sum W_i T_i} \quad (8)$$

Where W_i demonstrates the weight factor of job i and T_i is the tardiness of the job that is located in ith position in the sequence.

We use of roulette wheel mechanism for selecting the suitable parents in each generation and two operators are used in order to obtain the neighborhood points of the current solution that are described follows:

- Mutation operator: in each generation, a random chromosome is selected using roulette wheel and then two random integer values are generated in [1-N] interval. Afterwards, the positions of generated

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numbers are changed in the sequence and the selected chromosome is replaced by this one in next generation.

- Cross over operator: in each generation, two chromosomes are selected using roulette wheel and the first one is considered as father and the other is as mother chromosome. Then a random number in [0-1] interval is selected. If the random number be lower than 0.5 then the first job is selected of father chromosome and otherwise, the first job is selected of the mother and the selected job is located in a new chromosome (child chromosome). This process is iterated until that all the jobs transformed into child chromosome. Afterwards, one of the parents is replaced by child randomly and the other is remained in the population for next generation.

3-2. Simulation Annealing

Simulated annealing is among the most popular iterative methods that have been applied widely to solve many combinatorial optimization problems. In fact, SA is a class of optimization Meta heuristics that performs a stochastic neighborhood search of the solution space. The immense advantage of SA over classical local search methods is its ability to avoid getting trapped in local optima while searching for a global optimum. The underlying idea of this Meta heuristic arises from an analogy with certain thermodynamically processes (cooling of a melted solid).

It should be noted that SA procedures could be proportionately different in alternative problems but the basic principle of the SA can be described as follow:

Start from a current solution x, another solution y is generated by taking a stochastic step in some neighborhood of x while the degree of neighborhood is optional and apparently changes from problem to another. If this new proposal improves the value of the objective function, then y replaces x as the new current solution. Otherwise, the new solution y is accepted with a probability (Notice the difference with classical descent approaches, where only improving moves are allowed and the algorithm may end up quickly in a local optimum.) The probability came from a significant formula in metallurgy process that is shown as below:

$$P(\Delta E) = \exp(\Delta E / T) \qquad (9)$$

The value of T decreases in the course of iteration. Hence the probability of accepting worse solution will decrease too. In fact, reduction in control parameter leads to maintain current solution and just accept the improving solutions while the algorithm is running in the last iterations. All the mentioned procedures enable SA to avoid getting trapped in local optima. Detailed discussions of simulated annealing can be found in van Laarhoven and Aarts [22], Aarts and Lenstra [4]. In this paper, we consider control parameter (T) equals to 1000 and cooling schedule equals to 0.995. Another parameter that is highly effective on final solution is *nerp* that presents the number of running iterations in each temperature. In this paper, nerp is considered constant and is equal to 5 on each temperature.

3-3 using methods as hybrid

In this section, each two of the proposed methods are considered as a hybrid separately. It means that the initial solution is generated by one of them and another algorithm tries to reform the solution until the stopping condition of second algorithm is met.

Van Laarhoven and Aarts [22] showed that the sensitivity of SA to its initial sequence and its values of parameters is less than other meta-heuristics, therefore the probability of trapping in local optima for it is lower than other algorithms.

Base on this fact, SA is used to generate and order the initial sequence and afterwards GA try to reform the obtained solution separately.

4- Computational results

This section is divided to three parts in which the first part presents an approach to calibrating the parameters of proposed GA using a regression model. In second part the results of solving the problem using proposed approaches are presented and finally the third part offers the verification of proposed algorithms.

4-1 Calibration of GA parameters

In this section an approach is presented in order to adjust the GA parameters using a regression model. For this purpose four factors are considered as impressive operators on the function of algorithm include rate of mutation, rate of cross over, number of chromosomes in each generation and number of iterations that lead to stop the algorithm. The value of objective function that is generated by GA also is considered as the response variable.

The values that are considered for any factor are based on table 1.

Table 1- the values for proposed factors in regression model

factor	Considered Values
Mutation rate	0.2, 0.4, 0.6, 0.8
Cross over rate	0.2, 0.4, 0.6, 0.8
Number of chromosomes	20,30,60
Number of iterations	1000,2000,5000

According to these factors three different scenarios are described. In all computations the confidence level considered equal to 0.95. The scenarios are as follows:

Scenario A

Let suppose the function of GA is only related to the considered factors with a linear relationship and the interactions between them are not considered.

Figure1 depicts the regression model and its computations in this situation.

Regression Analysis: scenario A

```
* cross over is highly correlated with other X variables
* cross over has been removed from the equation.


The regression equation is
z = 7583 + 518 mutation - 5.92 num of chro - 0.0679 num of itter


Predictor        Coef  SE Coef     T     P
Constant       7583.3    130.5  58.11  0.000
mutation        518.2    161.2   3.22  0.003
num of chro    -5.915    2.120  -2.79  0.009
num of itter  -0.06791  0.02120  -3.20  0.003


S = 216.223   R-Sq = 47.0%   R-Sq(adj) = 42.0%


Analysis of Variance

Source         DF      SS     MS    F     P
Regression      3  1326797  442266  9.46  0.000
Residual Error  32  1496078   46752
Total          35  2822874


Source       DF  Seq SS
mutation      1  483294
num of chro   1  363875
num of itter  1  479628
```

Fig 1- the analysis of scenario A

Since the sum of mutation and crossover rates equal to 1 their values are correlated to each other. So the crossover rates are not considered in the equations. In predictor analysis, the P-values of all factors are less than α-level that indicates all the factors are impressive on value of objective function.

The p-value of analysis of variance is also less than α-level that means there are statistically significant relation between the factors and value of objective function. The value of R-square parameters is equal

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to 47% that implies the described factors can explain 47% of variances of value of objective function.

Scenario B

Let suppose the function of GA is related to interactions between factors as well as them that show a nonlinear relationship.

Regression Analysis: Scenario B

```
* cross over is highly correlated with other X variables
* cross over has been removed from the equation.


The regression equation is
z = 7714 + 426 mutation - 6.51 num of chro - 0.141 num of itter
    - 3.43 mut.num of chro + 0.0818 mut.num of itter
    + 0.00086 num of itter.num of chro


Predictor                  Coef   SE Coef     T     P
Constant                 7713.9    287.3  26.85  0.000
mutation                  426.0    472.0   0.90  0.374
num of chro              -6.505    6.340  -1.03  0.313
num of itter            -0.14051  0.07114  -1.98  0.058
mut.num of chro           -3.433    9.747  -0.35  0.727
mut.num of itter         0.08177  0.09747   0.84  0.408
num of itter.num of chro  0.000865  0.001282   0.67  0.505


S = 222.269   R-Sq = 49.2%   R-Sq(adj) = 38.7%


Analysis of Variance

Source         DF      SS     MS    F     P
Regression      6  1390171  231695  4.69  0.002
Residual Error  29  1432703   49404
Total          35  2822874


Source                 DF  Seq SS
mutation                1  483294
num of chro             1  363875
num of itter            1  479628
mut.num of chro         1    6127
mut.num of itter        1   34768
num of itter.num of chro   1   22479
```

Fig 2- the analysis of scenario B

Based on figure 2 although the P-value of analysis of variance is less than α but in predictor analysis all the P-values of factors are greater than α. this fact implies that the proposed model cannot explain the statistical relationships properly and is not effective.

Scenario C

Let suppose the function of GA is related to the square of considered factors as well as them and with consider of interactions.

Regression Analysis: Scenario C

```
* cross over is highly correlated with other X variables
* cross over has been removed from the equation.


The regression equation is
z = 7967 - 264 mutation - 8.4 num of chro - 0.218 num of itter
```


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```
    - 3.4 mut.num of chro + 0.082 mut.num of itter
    + 0.00086 num of itter.num of chro + 0.000012 num of itter . num of itter
    + 0.023 num of chro. num of chro + 690 mut. mut


Predictor                       Coef    SE Coef      T      P
Constant                      7966.7      562.9  14.15  0.000
mutation                        -264       1083  -0.24  0.810
num of chro                    -8.42      24.30  -0.35  0.732
num of itter                 -0.2183     0.1919  -1.14  0.266
mut.num of chro                -3.43      10.16  -0.34  0.738
mut.num of itter              0.0818     0.1016   0.81  0.428
num of itter.num of chro    0.000865   0.001336   0.65  0.523
num of itter . num of itter 0.00001249 0.00002841   0.44  0.664
num of chro. num of chro       0.0233     0.2841   0.08  0.935
mut. mut                       689.6      965.0   0.71  0.481


S = 231.599   R-Sq = 50.6%   R-Sq(adj) = 33.5%


Analysis of Variance

Source          DF      SS      MS     F      P
Regression       9  1428283  158698  2.96  0.015
Residual Error  26  1394592   53638
Total           35  2822874


Source                     DF  Seq SS
mutation                    1  483294
num of chro                 1  363875
num of itter                1  479628
mut+num of chro             1    6127
mut+num of itter            1   34768
num of itter+num of chro    1   22479
num of itter . num of itter 1   10362
num of chro. num of chro    1     360
mut. mut                    1   27390
```

Fig 3- the analysis of scenario C

In this case the P-value of model is less than 0.05, but like the second scenario, all the P-values of predictor analysis factors are greater than α. this fact implies that the proposed model is not effective.
By comparing the proposed Scenarios, it can be concluded that scenario A is the best effectiveness model that can be used to determine the estimation values of GA parameters. According to this scenario less rate of mutation operator can yield to better solution. So in proposed GA the rate of cross over should be considered more than mutation. Generally increasing the number of chromosomes and iterations reforms the function of algorithm that number of chromosomes is more impressive than other.
Finally the normal probability plot is drown for each scenario is depicted below:

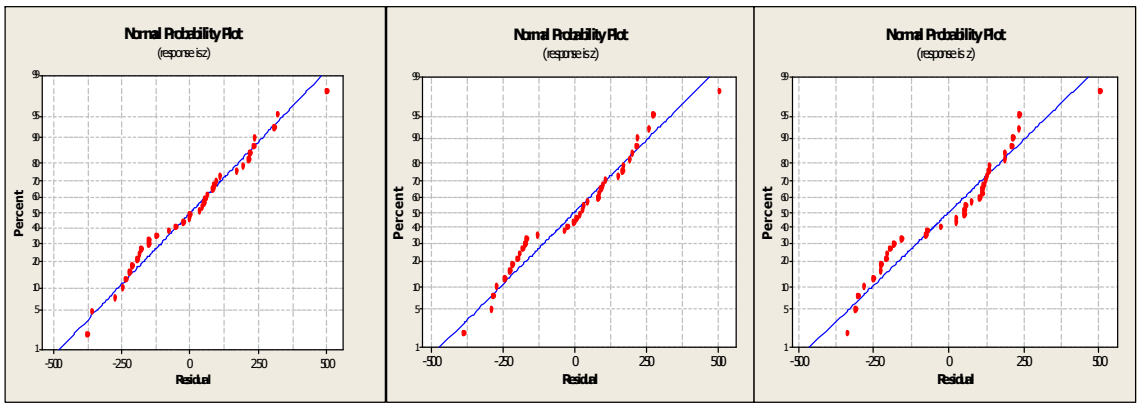

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Fig4- the plot of Scenario A fig5-the plot of scenario B fig6- the plot of Scenario c

Based on these plots it can be noticed that in scenario A the variations of response variable is less than the other scenarios.

4-2 the results of solving the model

This problem is coded by Visual Basic 6 on the system with cpu core i 7,1.6 GHZ and with 4 GB of RAM. the required values of parameters are generated according to julai et al [12] where processing times are selected from uniform distribution [1-100], weight factors from uniform distribution [1-10], setup times from uniform distribution [1-100] and finally due dates are generated from uniform distribution [0-$\rho\sum p_i$] and ρ is a controlling parameter for due dates and has the values of 0.2, 0.4 and 0.8.

We solve the problem for three scales of job numbers include small, medium and large that their values are 10, 25 and 50.

Each sample is run 10 times and the best solution for each scale and ρ parameter is offered as the value of the objective function.

Table 2 shows the values of objective function when the hybrid algorithm is used. As mentioned, SA is investigated to generate and order of initial population and GA is used to reform the solution separately.

Table2- the comparison between hybrid algorithms

N	ρ	GA	SA + GA	SA
10	0.2	6654	6359	6767
	0.4	37225	37225	37225
	0.8	4092	4067	4092
25	0.2	31463	30466	31756
	0.4	20571	17715	20797
	0.8	12626	12137	12896
50	0.2	134057	133728	134057
	0.4	77417	74985	77417
	0.8	56309	56309	56309

According to table 2, the hybrid of SA and GA are very efficient.

All the proposed methods have a stochastic approach to find the suitable solution, so in order to better comparison, we examine them statistically and the results are shown in table 3.

Table 3-Examining the hybrids statistically

N	algorithm	best	average	worst	SD	SD/average
10	**SA**	37225	37646	37969	319.8409	0.008496
	SA+GA	37225	37434	37722	207.7677	0.00555
25	**SA**	18032	20042.2	21981	1366.025	0.068157
	SA+GA	17308	18148.6	19362	907.9671	0.05003
50	**SA**	138881	142733.6	147482	2848.804	0.019959
	SA+GA	134080	139061.3	146432	3986.411	0.028667

In table 3, *N* denotes the number of jobs and the second column demonstrates the kind of used method. For all data sets, Each method was run 10 times and the best, average and worst values were written on column 3 till 5. Two last columns also demonstrate the standard deviation and coefficient of variation respectively.

According to statistical examinations, it can be concluded that the hybrid of SA and GA performs effectively rather than simple SA, but its variation of solutions is more than of SA.

4-3 checking the verification of solution approaches

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To check the verification of proposed hybrid, the optimal solutions for some data sets of problem are obtained using a software code that is generated by c# and searches all solution spaces to find optimal solution. The results are compared to the values of each method that are shown in table 4.

Table4- verification of proposed hybrids

N	Global optima		SA + GA			SA		
	VOF	Time (sec)	VOF	Time (sec)	%Error	VOF	Time (sec)	%Error
4	433	0	433	0	0	433	4	0
6	933	0	933	1	0	933	9	0
8	1276	0	1276	1	0	1276	14	0
10	2455	0.1	2455	2	0	2455	16	0
12	3961	2	3961	2	0	3961	18	0
15	7633	255	7633	3	0	7633	19	0

Where first column shows the number of scheduled jobs, VOF demonstrates the value of objective function and %Error shows the percentage of error due to each approach that is calculated as:

$$\%error = \frac{vof(hybrid) - vof(global\ optima)}{vof(global\ optima)} * 100 \qquad (10)$$

This comparison shows that the proposed hybrid presents the optimal solution till 15 jobs but the hybrid of SA and GA performs much faster in compare to simple SA. The run time of proposed software is very suitable until 12 jobs but its value increases exponentially for grater job numbers so that for 20 jobs and more the problem cannot be solved using it.

5-Conclusion

In this paper, the problem of Single machine total weighted tardiness problem was considered and because of immense complexity, a hybrid based on GA and SA was used to obtain near optima solution in reasonable time. In order to reform the function of proposed GA an approach based regression model was investigated that calibrated the initial parameters of GA. In computational study section the problem was solved using various data sets that the proposed hybrid presented the best solution. To better comparison of proposed methods they were examined statistically and in order to verification checking, some data sets of problem was solved using a software code generated by C# that generated the optimal solution by searching all the solution space. This comparison demonstrated that both proposed methods could lead to global optima for 15 jobs and the hybrid of SA and GA performed faster.

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Labor Unions' Efforts for Prevention of Environment Deterioration and Climate Change (Review Research)

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Abstract

Labor unions are the organization which, have mandate of only struggling to secure financial and non-financial benefits for their members, like rise of wages, bonuses, insurance benefits, overtime payment, job security, comfortable work place, recreational facilities and decreasing fear of employer through collective bargaining. But many researchers have also discovered that unions also have rendered services beyond collective bargaining. This study explored the role of labor unions in prevention of climate change and protection of environment by exerting many types of efforts. Labor unions have contributed reasonable part in conservation of climate and green environment.

Introduction

The Australian Bureau of Statistics has defined labor union as: "An organization, consisting predominantly of employees, the principle activities of which include the negotiation of pay and conditions of employment for its members", (ILO 'World Labor Report 1997-1998'). " So core business of labor unions is to organize for fair terms and conditions of work, negotiate on behalf of the work force, provide services for members, network, and mobilize them (Knowles and Eade, n.d.), and labor unions are rarely recognized for their roles and activities outside of industrial matters (Snell et al. n.d).

Many researchers have reported that general perception about labor unions is not positive (Khan 2010). They believe that unions are largely responsible for low productivity and lower production. Employers allege that labor unions, only talk about workers' rights and ignore their obligations (Ghayur, 1996).

But according to Khan (2008, 2010,) Khan and Khan 2011) unions are also playing role beyond collective bargaining in 'Environment & Climate Change', 'Energy Resources Planning & Management', Public Health & Sustainable Development', Poverty Alleviation, and Training, Education & Skill Building and also for the benefit of employers. Therefore many researchers have admitted the unions' role beyond their definitional mandate.

When union activities surrounding non-industrial matters serve as a focal point they are often analyzed or discussed in relation to productive relations and the vested interests of trade union

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organizations.

Research Methodology

This research article has been developed from literature about role of labor unions for environment protection published in research journals in the form of research articles, working papers of institutions and universities, research reports of various organizations and books of labor unions concerned scholars and environment concerning scientists.

Environment and Climate Problem

Gabaglio & Sapir (2002) had expressed that the most serious problem is climate change resulting from emissions of greenhouse gases, due to use of fossil fuels used to obtain energy which is a basic resource to social and economic development. But its use and transformation have caused significant environmental problems, ranging from urban pollution to acid rain, marine pollution and nuclear waste. Leeuwen (2009) has also reported that at a recent UN leadership forum, Secretary General Ban Ki-moon told more than 100 international leaders that climate change is the pre-eminent geopolitical and economic issue of the 21st century.

Ryder's (2009) report disclosing the fact that an average 262 million people per year were affected by climate-related disasters during 2000-2004, underlines the scale of the threat. The world is beginning to run out of time; we cannot wait any longer for the worst effects of climate change to be avoided, or at least reduced. Ryder asserted that urgent action to tackle climate change is the only way for massive economic, social and environmental damage or even catastrophe to be averted.

Kojola, (2009) revealed that in March 2008 the American labor union, (American Federation of Labor-Congress of Industrial Organizations) AFL-CIO 's Executive Council issued a statement saying, "It is time for our nation to take bold steps to meet the 21st century challenges related to climate change. Scientific evidence has confirmed that human use of fossil fuels is undisputedly contributing to global warming, causing rising sea levels, changes in climate patterns and threats to coastal areas." The Federation now backs a cap and trade policy, along with investment incentives for clean energy.

Labor Unions' involvement in Environmental and Climate

Issues

Gabaglio & Sapir (2002) expressed that the labor movement's stance on climate change has evolved in the past eight years, as unions are beginning to recognize the job benefits from a green economy and reconsider their stance on clean energy, the environment and climate change. Environmental issues have been raised in collective bargaining by trade unions. Topics like hazardous substances, traffic, waste handling have been put on agendas. Workers' representatives and trade unions have acquired rights to take environmental initiatives and to participate in drafting environmental management plans.

According to European Trade Union Council (ETUC, 2002) the Johannesburg Earth summit provided the platform for the development of a global action plan, in which the involvement of trade

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unions in the development and implementation had been assured.

According to Inoue (1999) in Japan before Rengo (a large Japanese labor union) was established, trade unions were already active in environmental protection. They had been campaigning against water pollution, air pollution and deforestation since the 1960s. Rengo has expanded the scope of its environmental policy to include global issues since around 1992 when Rengo sent a delegation to the Global Environment Summit held in Rio de Janeiro. The pillars of Rengo's environmental policy are prevention of global warming, control over hazardous chemicals, and the promotion of waste management/ recycling. It also advocates environmental standards for industry and respect for the natural environment. Rengo's approach is to structure a recycling society, and the organization has gradually developed a way of promoting environmentally sustainable business and industry, community living and personal lifestyle.

About USA Kojola (2009) reported that, before the mass environmental movements, of the late 1960s, labor was one of the strongest supporters of pollution control because of occupational and public health concerns. In the early 20th century, unions and environmental groups began to make connections between hazardous materials in the workplace and in the environment. By the 1970's labor support in USA helped to pass 'The Clean Air Act 1970' and 'The Clean Water Act 1972'. Environmentalists for Full Employment was formed in the 1970s and organized several conferences with unions and garnered support for the 'Humphrey-Hawking full employment bill'.

Ryder (2009) has traced that trade union discussions on sustainable development began with preparations for the world's first 'Earth Summit' in Rio de Janeiro in 1992. This process has intensified in recent years, particularly in the course of developing a common policy and strategy relating to the December 2009 meeting in Copenhagen of the United Nations Framework Convention on Climate Change (UNFCCC).

Buffa et al (2008) and Kojola (2009) expressed that in USA unions like the United Steel Workers (USW) rank and file have been militant on environmental issues, promoting environmental improvements, opposing compromises over air quality regulations in the 1970s, even if it meant job loss, playing a key role in the passage of the Clean Air Act, and more recently in global warming mitigation policy.

Labor Unions' Role

Labor unions in several countries exerted efforts for improvement and protection of environment. According to CSD (1998) National trade union centers in Ghana, Eritrea, Zimbabwe, Zambia, Tanzania, India, Malaysia, the Philippines, Barbados, Grenada, Jamaica, among others, have developed policies and action plans on environmentally sustainable development priority issues. In Spain trade unions participated in coalition to present action plan on climate change. In Italy three trade union organizations discussed with local organizations and residents about establishing an inter-regional park to promote tourism, improve agricultural practices and stimulate local industry, whilst saving and cleaning up the environment. Following meetings and discussions, an accord was reached on an organizational structure to set up the park. In UK Transport & General Workers' Union and the General and Municipal Workers' Union arranged a meeting between senior managers and Green-peace to introduce an acid recycling plant to solve the problem of discharge of harmful chemical waste.

Valenduc (2000) reported that in 1995, the 'CSC-union' of 'white collar workers' (CNE) received the yearly award of the environmental associations ("green palm"), as an acknowledgement for its initiatives and actions in the area of prevention and protection of the environment.

Discussants of CSD (2001) quoted in detail example of Japan, Spain and Germany. Japanese Trade Union Confederation (JTUC-RENGO) has initiated a nation-wide program to educate workers and encourage them to adopt more environmental-friendly patterns. Unions have planned, implemented, evaluated and reviewed initiatives, to reduce energy consumption and waste by developing committee structures and educational programs, holding 'clean-up campaigns' in the community, to encourage sustainable behavior and promoting a general understanding of environmental issues. As a second stage, the program is directing attention to domestic behavior, by

encouraging family 'eco-meetings', specific measures to conserve water and energy, and encourage family purchasing which looks for environmentally-friendly products and eco-labels. UGT (Union Generale de Trabajadores) in Spain has applied research into environmental problems to introduce a sustainable development strategy, discussed its impact on specific industrial areas, and effective ways to bring about change in both community and workplace. It examines the economic impact of these problems on specific industrial areas, and upon employment. Finally, it examines the various ways in which trade unionists can employ legal and trade union instruments to bring about change, both in the state of the environment, and in workplace culture. Similarly in Germany unions are collaborating with government and employers' federations in a program of building renovation to contribute to climate protection and sustainable jobs. The Alliance for Labor and Ecology for the Energetic Renovation of Buildings aims to renovate 300,000 flats, creating 200,000 jobs, reducing both CO_2 (Carbon dioxide) emissions and the oil bill of tenants and landlords and the state.

Gabaglio & Sapir (2002) asserted that although European trade unions are primarily recognized as central actors within economic and social spheres, they have also been involved with environmental issues for a long time. As a result of this experience, it is becoming more and more clear, that environmental issue can no longer be regarded as an external cause outside of a union's core domain to be dealt with as part of the trade unions' extended responsibilities. Instead, unions are recognizing that environmental questions are intrinsically connected to core trade union issues concerning resources, risks, democracy and equity. So programmatic trade unions in Europe have adapted their political programs to face the environmental challenge, and have issued statements accordingly. CSD (2008) admitted that workers and trade unions involvement are essential ingredients for change where collaboration with employers and governments could facilitate effective workplace action for environmental protection and community wellbeing.

According to World Summit on Sustainable Development (WSSD, 2002) in Romania**,** the National Free Trade Union Confederation of Romania-Brotherhood (CNSLR-FRATIA) joined a broad local coalition to reduce pollution and in Guatemala, Kenya, and Thailand the International Union of Food and Agricultural Workers (IUF) worked with pesticide companies to assess the Global Crop Protection Federation's Safe Use Projects (SUP) and the Conservation, Hotels, Domestic and Allied Workers Union in Tanzania worked for environmental management and for better working conditions for a sustainable tourism industry.

According to Canadian Labor Congress (2003) **'**The Brotherhood of Locomotive Engineers' (BLE) has worked on lowering diesel emissions and the re-burning of exhaust; lobbied for rail fuel tax reductions; and, pressured employers over sturdier railcars.

Discussants of United Nations Framework Convention on Climatic Change UNFCCC (2006) quoted the examples of unions of Spain, Argentina and Belgium in contribution for environment. In Spain in 2006, the first round of the Social Dialogue Tables was held with representatives of the Spanish trade union confederations, business organizations, along with environment, labor and industry Ministries, wherein, parties assessed the first year positive results of the compliance for the industrial sectors with the National Allocation Plan (NAP). Seven follow up Dialogue Tables were then organized, one for each industrial sector, for the purposes of reviewing the mandatory green house gases (GHG) emissions' reduction in the NAP. In Argentina trade unions & government reached on a 'Sustainable Development Agreement'. At the end of June 2005 the 'Confederación General del Trabajo (CGT)' signed an agreement with the national government of Argentina to jointly implement agreed measures that would address environmental issues. CGT and its affiliates hosted first workshop on "The World of Work and Sustainable Development" to design an initial program of action, with a particular emphasis on the environment and planned five regional meetings where trade union leaders and representatives from the government, social movements and international organizations had to discuss ways of including environmental provisions within collective agreements, links to decent jobs policies and legal frameworks for the environment at the workplace, among other issues. The meetings aimed to provide conclusions and commitments, based on sectoral and regional realities, as a basis for the first "Environmental Commitment" between the government and workers. In Belgium government along with Belgian Trade Unions, has shown how flexible mechanisms can be made to support social and employment policy. According to UNFCCC under the rules for the 2008-2012 year period,

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Belgium must reduce greenhouse gas emissions by 7.5% (compared to their 1990 levels). To do so it has incorporated a set of social criteria within the terms of its call-for-tenders to purchase greenhouse gas emission quotas thereby following recommendations of a technical committee composed of government, trade union, employer and NGO representatives. Through the implementation of the flexible mechanisms policy makers must truly seek a balance between economic, environmental and social impacts. Trade Unions therefore call on governments to legislate new statutory rights that are prerequisites to full participation, i.e., time off and training to carry out duties for environmental representatives, revision of employment rights regulations to formally recognize environmental duties and provide for paid release, among others.

> According to CSD (2001) the European Trade Union Confederation (ETUC) has provided a blueprint for measures to integrate labor market issues into government support for alternative production measures: promotion of new and cleaner technology through taxation and other measures; introduction of eco-labels for clean production; development of eco-efficiency indicators; support for research and development of new and cleaner technology; reduction of obstacles for entrepreneurs of environmental technology; provision of training for eco-entrepreneurs and self-employed; training for workers in environmentally-friendly production; participation of workers in introduction of new, cleaner production; adaptation of organization of work to environmentally friendly production; and further development of ecological management instruments such as the European Eco-Management and Audit Scheme (EMAS).

UNFCCC (2006) also reported that European Trade Union Confederation (ETUC) is leading a group of organizations and governments composed of the French consultancy SYNDEX, the German Wuppertal Institute, the Spanish institute ISTAS and the Italian institute SindNova conducting a study on the implications of climate change and CO_2 reduction, policies for employment and economic activity in 11 European Union (EU) countries.

The project is co-financed by the European Commission and Belgium, Finland, France, Italy, Spain and the U.K. The main objective is to explore how employment, qualifications and vocational training can contribute to a transition towards a low-carbon E U economy, which is fair from the workers' point of view. In addition, the purpose is to promote dialogue about employment and climate change among actors and social partners, within sectors, countries and the EU region.

According to discussants of UNFCCC trade unions called on governments to facilitate the development of such measures by placing climate change within a sustainable development framework which integrates national development and poverty reduction strategies with other environmental priorities; e.g. biodiversity and desertification. Such planning must also be linked to mitigation and adaptation policies, including those for vulnerable groups (i.e. the poor, youth, the unemployed, those who will suffer for their dependency on fossil fuels) because they affect their access to energy, water, sanitation, agriculture, health, education, transport and disaster prevention, etc.

According to proceedings of CSD (2001) representatives of trade unions i.e. International Confederation of Free Trade Unions (ICFTU), the Trade Union Advisory Committee to the OECD (TUAC) and the European Trade Union Confederation (ETUC) and representatives of business, at a Climate Change Conference pledged to work together to obtain recognition by world governments of the need for research into employment implications of climate change or measures to mitigate its effects.

UNFCCC (2006) revealed that the Spanish good practice provides a good example of effective worker and Trade Union participation on climate change decision making, Spanish Government, Unions and Business Created Tripartite Climate Change Plan in 2005. A trend-setting agreement, to institutionalize joint oversight of national compliance to the Kyoto Protocol was adopted by the Spanish government, along with the leading trade union and business organizations in the country. Trade unions urged COP12 (12^{th} Conference of the Parties for UNFCCC) to move forward on the policies: (#1) Promote analysis, discussion and action on employment consequences of climate change policies and consequent events. A joint trade union study on employment consequences of climate change policies in Europe should be employed as a model for other regions.

(#2) Ensure trade union participation in decision-making, as the involvement of workers is essential to

the sustainability of climate change policies affecting both production and consumption.
(#3) To target workplaces as consumers of energy, and other resources and generators of wastes linking clear workplace targets, for energy efficiency and waste minimization, to sectoral and national carbon and waste reduction strategies.
(#4) Encourage public investment to support a long-term shift in energy policy, towards sustainable labor-intensive energy solutions.

In UK a joint government-trade union committee is working through a wide range of strategic policy issues to tackle climate change. For the unions, a key issue is to strengthen union engagement, both in the workplace and at a strategic policy level covering energy and climate change issues. The Green workplaces Project, had key aspects including: designing training courses, setting up frameworks for negotiating and representing members on environmental issues, and developing pilot projects which can be built on in future years. The project is based on the principle that union involvement is crucial both in pushing management to take urgent action on climate change, encouraging behavior change amongst the workforce, and taking collective action to tackle climate change through workplace action. The Trade Unions Sustainable Development Advisory Committee (TUSDAC) was set up in 1998 published a consultation report, Greening the Workplace (in 2005) and a new 10-points guide for union activists (in 2006) (UNFCCC 2006)
Buffa et al (2008) expressed that today U.S. unions are starting to voice their support for policies to reduce global warming. Factors leading to the shift include increasing concern about climate change amongst the general public, concern about worker health and safety, and the influence of such groups as the Apollo Alliance (which is a coalition of labor unions, environmentalists, community groups, and businesses that advocates for clean energy policies that would both address the climate crisis and expand opportunities for U.S. businesses and workers in USA). Organized Labor unions have also participated in regional and national climate change efforts in USA and Canada. Buffa et al (2008) have revealed that the California Labor Federation has joined with other labor federations in the Western U.S. and Canada to participate in the Western Climate Initiative (WCI), a proposed regional cap-and-trade program. Actions have included attendance of California, Oregon, Utah, British Columbia, and Ontario labor representatives at WCI stakeholder meetings in Salt Lake City in May 2008 and San Diego in July 2008 for the purpose of advocating the incorporation of the concerns of working people into the design of the WCI. In June, the British Colombia Federation of Labor, and the Oregon AFL-CIO sent a joint letter to the WCI, expressing their positions on such issues as the auctioning of allowances and the use of offsets. Now that ARB (California Air Resources Board) has proposed coordinating its cap-and-trade program planning process with that of the WCI, organized labor's participation in the development of the WCI cap-and-trade program is more important than ever.

Gabaglio & Sapir (2002) expressed that the labor movement's stance on climate changehas evolved in the past eight years, as unions are beginning to recognize the job benefits from a green economy and reconsider their stance on clean energy, the environment and climate change. In the late 1990s the national AFL-CIO began a process of dialogue around climate change highlighted by John Sweeney appointing Jane Perkins, former president of Friends of the Earth, as environmental liaison to facilitate discussion and work with environmental groups. However, an agreement was not obtained in this initial attempt, although some unions, like the USW, continued efforts to develop an acceptable stance on climate change. Gabaglio & Sapir (2002) revealed that environmental issues have been raised in collective bargaining by trade unions. Topics like hazardous substances, traffic, waste handling have been put on agendas. Workers' representatives and trade unions have acquired rights to take environmental initiatives and to participate in drafting environmental management plans. **Gabaglio & Sapir** further expressed that trade union members, health and safety representatives and works councils have taken initiatives to improve the standard of environmental management through training courses.

Gabaglio & Sapir (2002) and ETUC (2002) also reported that to save soil from pollution and contamination of fertilizers in 1995 the Danish trade union SiD (Specialarbejderforbundet i Danmark)

produced a policy proposal with the objective to reduce the consumption of pesticides by 95% by the year 2000. SiD proposed to have the real social production costs for conventional and organic agricultural product made visible. Meanwhile, the evidence to date shows that the proposals have been effective, as the consumption of pesticides in Danish farming has been reduced by around 75% between 1995 and 2002. SiD proposed a special effort to promote pesticide-free cultivation (also through R&D in new races and seeds), in order to ensure a sustainable Danish production of high-quality fruit and vegetables. As to Danish forestry, it was suggested that labeling would be introduced in order to guarantee that the product (wood) has been produced in an environmentally correct fashion, both with regard to the external environment and the working environment. Respect for the rights of employees must be included in such a labeling system, both with regards to education, training and other working conditions, including the working environment.

According to European Trade Union Council (ETUC, 2002) in Marghera near Venice an area with a lot of textile industry, harbor activity and refineries, due to the effects of the intensive use of chemicals over a long period of time and to the economic downfall of the industry, the area had degenerated into a deplorable state. Representatives from government, regional administration, national trade unions, regional trade unions and industry entered into consultations in order to develop a revitalization plan. The consultations finally led to a complicated agreement that sought to reclaim the area, modernize the enterprises and attract new economic activities. A committee in which all involved bodies participate presently manages the agreement.

Leeuwen (2009) revealed that EI (Education International') and its affiliates insist that climate change is, indeed, a union issue. Education unions are beginning to engage in collective bargaining for measures to reduce the carbon footprint of their schools, colleges and universities. Some member organizations are already recruiting environmental reps, which would work like green shop stewards to promote environmentally positive policies and practices. Change is never easy. But in these times of multiple global crises it's more important than ever that we work in a spirit of collective good will and solidarity to build a new global agreement to mitigate climate change.

Evans (2009) expressed that achieving environmentally and socially sustainable economic growth the trade union movement is urging developed countries to make ambitious commitments on emission reductions, in line with their responsibilities and their capacities. Action to meet these commitments will drive changes in production and consumption patterns, creating new jobs and transforming existing ones. Climate change action is thus one of the main building blocks of a new economic model, which takes account of the fragility of our natural resource base and the need to preserve it for future generations. But securing social sustainability in the shift to the green economy will depend, on achieving a Just Transition.

White Aidan (2009) revealed that the IFJ (International Federation of Journalists) and other Global Union Federations are also working on communications programs with the wider trade union movement, much of it in countries where the impact of climate change is being felt and where there will be potentially disastrous consequences. Unions need to ensure that their messages about how they and their members are responding to the crisis are getting into the communications mainstream. Unions realize more than ever that media have both the reach and credibility to make all stakeholders take climate change issues seriously.

ETUC (2011) reported with reference to the discussants of European Social Partners dialogue on Climate change that in Germany, the purpose of the "Network Resource Efficiency" is to put in place action plans to develop resource efficiency in the industrial sector (energy and raw materials) and thereby to contribute towards the greening of industry. They include the aspects linked to the needs for skills and vocational education/ training. Under this initiative, the DGB (Confederation of German Trade Unions German: *Deutscher Gewerkschaftsbund*) and its member organizations, in cooperation with the Environment Ministry (BMU), launched and carried out some programs to train members of works councils and employees about resource efficiency, primarily in the aluminium industry, involving the trade union organization IG Metall (Industriegewerkschaft Metall) and the German association of aluminium producers GDA.

European Foundation (2011) asserted that trade unions could adopt the green economy in their

strategy and action plans. Trade unions have become much more involved in environmental issues and debates regarding climate change since the 1990s. All trade unions at the European and international levels have published policy papers on climate change – for example, for United Nations climate change conferences in Copenhagen in 2009 and Cancún, Mexico in 2010. They are also active in regard to green issues. At the European level the European Trades Union Confederation (ETUC) adopted a resolution on combating climate change for the conference in Cancun and is involved in the EU social partners' project to develop a joint approach to the social and employment aspects and consequences of climate-change policies.

Conclusion

From the above detailed literature review it can be concluded that environmental deterioration and climate change is the most serious problem of mankind of present time, and many organizations are engaged in its solution. Labor unions are also among these organizations which exert their efforts for the conservation of climate and environment by striving for making environment friendly laws, cooperation other environment friendly organizations by making alliances with them, by giving awareness and imparting environment related education and training to their workers. Unions have also launched campaigns against use of those chemicals in factories and pesticides and fertilizers in agriculture lands that contaminate the soil and pollute the atmosphere and also contributed their efforts in usage of environment damaging vehicles. Unions have also been campaigning against global warming water pollution, air pollution and deforestation in country like Japan.

Therefore it is needed to acknowledge and appreciate the unions' sincere efforts and also help and co-operate unions in their struggle of conservation of climate and green environment. Governments should also award and reward unions for encouragement.

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Using integrated fuzzy AHP and fuzzy TOPSIS methods to explore the impact of knowledge management tools in staff empowerment (Case study in knowledge-based companies located on science and technology parks in Iran)

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Abstract

Employees are critical factors for organization survival Therefore, empowering of them can play an important role in increasing the competitiveness of organizations. Studies show that five dimensions are effective in empowering which includes: "work meaning", "competence", "self-determination", "impact" and "trust". Knowledge management is one of the issues connected to human resource management and employee empowerment and various tools are used in processes related to knowledge management in organizations. The aim of this study is evaluation of knowledge management tools in employee empowerment. Therefore, seven knowledge management tools were selected by asking experts' point of views. The statistical population of this study was considered the Knowledge-based companies located in science and technology parks and ultimately 43 questionnaires were studied. In this study integrated methods of Fuzzy AHP and Fuzzy TOPSIS were used in order to ranking seven tools of knowledge management. Results shows that among of seven tools "by asking experts' point of view" and "In-service training" have greatest effect on employee empowerment and "Job Rotation" and "impact" have minimal effect on employee empowerment.

Keyword : Knowledge Management , Empowerment, AHP ,TOPSIS, Fuzzy

Introduction

With increasing complexity and development of competition in new business world, companies and organizations for their survival seek to maintain and improve their competitive advantage. By development of countries, economy is farther from its traditional structure that was based on low cost production resources such as raw materials and low cost labor and becomes increasingly dependent on knowledge. Where the new economics has been called knowledge economy. In not long past the major value of organization was to tangible assets like real estate equipment and machinery, but today the value of organization arises from its intangible assets that knowledge and human resources are main core of them. Daum research in the review of 500 companies shows that these company's intangible asset value has increased from 38% in 1982 to more than 84% in 1999 [14]. Hence we are seeing increase in international attention to the issue of knowledge management. On the other hand, all experts of management and economy agree that having a high quality workforce is one of the secrets of survival in the third millennium. These scientists believe that the employees are key factor to productivity quality and profit for organizations [5].Therefore the most important source of competitive advantage in organizations are motivated, committed and expert employees [9].So one of the most important areas in management is human resource management. Knowledge management also requires serious attention to human resource in order to effective performance. So that in many studies the most important element in knowledge management is human resources. McCune said that

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the knowledge management is development and deployment of tangible and intangible knowledge resources in organizations [20]. Tangible assets of the company are patents, license and customer and competitor information and the company's intangible assets are knowledge behind employees, including their experience and methods to solve problems. So there is close relationship between knowledge management and human resource. Given the importance of human resources in survival of organizations wide effort is done to empower them to increase the competitiveness power of organizations in this way and able to transform the global economy to gain a larger share of the market. Empowerment is a process of development. A process raises understanding and insight of staff and will improve their efficiency and enables them to identify and understand environmental problems and with controlling them try to resolve problems [11]. Also in many definitions of knowledge management, employee empowerment is mentioned as one of the goals of knowledge management [25][17].Daft is expressed the definition of learning organization: each member organization instead of just trying to improve efficiency must constantly learn new entries and must be able to identify and solve problems in their field activities. In other words, the purpose of learning ability in a learning organization is reinforcing to its people capacity they can do things that it could not before. Various tools are used in implementation of knowledge management that each of these tools are effective in achieving the objectives of knowledge management. According to the type of organization and the expected goals of knowledge management, several tools are used. Tools that sometimes are not known as knowledge management tools. For example, results of research that have been done in the Netherlands in 2000 shows that generally, the 79 tools of knowledge management are used in small and medium enterprise [6]. Tools such as documentation, map of knowledge, education, the report during labor, organizational portals, reference pages and ... are the tools used in knowledge management processes. In our country, numerous studies have been done on knowledge management issues and employee empowerment. But our survey shows that few studies has been done in relationship between knowledge management and employee empowerment and research is not performed about the impact of knowledge management tools in employees empowerment. In this study knowledge-based companies stationed on science and technology parks were selected and studied as statistical population. Fuzzy Analytical Hierarchy Process widely is used on decision problems involving the selection and evaluation of several criteria. Practical applications described in literature shows several advantages in the study of non-quantitative criteria using this method to obtain reliable results. Therefore in this study fuzzy AHP method was used to compare the impact of knowledge management tools on empowerment employees.

1- Employees empowerment

The empowerment can be considered as utilization of the employees' capacities that are not being used. Employees have hidden power through knowledge, experience and their motives and in fact, empowerment is releasing this hidden power. In empowerment should be trying to individual and organizational goals are aligned with each other to achieve the desired result for the organization. So staff in addition to the authority need to education, credit and basic information to be accountable in their decisions [28].

Different views about empowerment are presented. Before presentation of cognitive empowerment perspective in 1990 and its development in later years, empowerment were considered as giving authority, giving decision making power to lower-classes in organization and employee involvement in information, knowledge, rewards and power [8][16]. Generally in the literature on this subject, empowerment means sharing power and empowerment is meant motivational and cognitive. Here we will describe these two approaches.

1-1-1 **Empowerment** means of sharing power

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In this approach one of the important goals of empowerment, is the active participation of employees in the workplace. Employee participation is a process through which power is divided between people [19].Thus empowerment can be considered as a form of decentralization that involves transfer of key decision authority to subordinates [23]. These theorists, say that empowerment, is aligned with organizational power and authority delegated to the staff [21].

1-1-2 Psychological empowerment

Thomas and Velthouse believe psychological empowerment is process to increase internal motivation to do the better job and distinguish between management strategies and organizational factors and staff perception about potency. Given that empowerment is rooted in the needs of individual motivation, they are noted four cognitive empowerment including: "work meaning", "competence", "self-determination" and "impact" [27]. Whetten and Cameron while emphasizing the multifaceted nature of empowerment and verified the above four dimensions, added the "trust" based on Mishra studies [2]. These dimensions are briefly described below.

1-1-2-1 Work meaning

When people feel to pursue important and valuable their occupational goals, they will have to feel meaningful [3]. For this purpose, people at work should feel that their time and energy is considered valuable. Spreitzer says meaningfulness is proportion of the job requirements and beliefs, values and behaviors of individual [18].So regardless of organizational forces, employees tend to try about the goals that have meaning to them. Also, people prefer to work with people who have similar values with them [13].

1-1-2-2 Competence

Competency means that the person fells has required skills and expertise to do jobs. In other words, not only sees his ability to do job, but also is sure to accomplish it successfully. In such conditions employees may feel self-efficacy [27].

Bandura believes that three conditions for the employees' sense of efficacy are essential:

- Belief in the ability to do the job;
- Believe in to have the capacity to apply the necessary effort;
- Believe in that no external prevents cause them not to work [2].

1-1-2-3 Self-determination

Autonomy or having self-determination represents the freedom and independence level of employees in determining the activities required to perform job duties [27]. Whetten and Cameron express that sense of autonomy means to experience a sense of choice in the beginning and to improve the occupational activities. This feeling has a direct relationship with the level of individual control over work. So when people feel to autonomy has willing to participate in activities. So work forces will be replaced by voluntary participation [2].

1-1-2-4 Impact

Impact can be degree of effectiveness on strategic, operational and administrative result of job [18]. Empowering individuals seek change in their working environment, Do not see themselves under control of environment and try to make aligned environment with their goals. In other words, the people who have this feeling try to keep their dominance on everything that they see rather than reactive behavior in the environment [27].

1-1-2-5 Trust

Trust refers to relations between subordinates and upstream. Empower people ensure that will be treated with them in fair, same and based on performance. Trust is highly correlated with a sense of security and this means that empowering people are sure that the authorities will not harm them. The feeling that behavior of others is reliable, information is reliable and authoritative and promises to be practical; all of these are some part of formation and growth of sense of empowerment in people [2].

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1-2 Knowledge Management

Although there are different definitions of Knowledge Management, but generally knowledge management refers to how create, share and retain knowledge in organizations [4]. Researchers in knowledge management, in addition to above are also considered other dimensions. Davenport and Prusak are also considered development and organizing of knowledge [1]. Celemmons also has added identification to other dimensions [12]. Gelinas et al in a more comprehensive definition are considered the knowledge management a process to find, storage, retrieval and distribution of knowledge [17]. From another perspective, knowledge management is an approach to controlling and directing the organization's tangible and especially intangible knowledge assets, so that using knowledge within and outside the organization, production knowledge, value, innovation and improvement in the organization will be facilitated [29].

Knowledge management is closely linked with human resource management. Employees produces the knowledge and maintain and use it. With the arrival of new employees to the organization's knowledge is increased and with leaving the organization - if not the implementation of knowledge management system - the organization loses some of their knowledge. In discussion of organization's intellectual capital, human resources has always been an essential component. For example Boedker and colleagues are considered human capital as one of the three elements of intellectual capital [7].

1-2-1 - Knowledge management tools

Knowledge management includes tens of methods and techniques to get more explicit and implicit knowledge of organization [26]. Different tools are used for knowledge management according to implicit or explicit knowledge, large and small organizations, the geographic concentration or dispersion, the level of knowledge and.... In some views the role of information technology in knowledge management has been very bold and even some people consider the knowledge management as an advanced information management system. But in fact, the knowledge management is far beyond implementation of an information system in organization and information technology has the only role of a facilitator. Therefore, in accordance with the requirements of organization the tools are used in many cases are not based on information technology. With review of knowledge management tools literature it was found that a wide range of tools are used in organizations. For example, Beijerse in his study has identified over 100 tools in knowledge management literature [6].

1-3 - Identify the most widely used tools for knowledge management in Iran

Given the diversity of knowledge management tools we have attempted to initial selection of the influencing tools over employees empowering. In this section, 24 primary tools that seemed to have a greater impact on the empowerment of employees were selected by reviewing the literature among identified tools. The tools are listed in table (1).

Table (1): Effective knowledge management tool on employees empowering [6][22]

Knowledge Management tools			
Communities of practice	After action review	Enterprise Portal	Group problem solving techniques such as brainstorming
Knowledge map	Peer assist	Job Rotation	Quality circles
Training	Site knowledge visit	Career planning	Think tanks
Formal education	Exit interview	Expert advices	Visiting exhibitions
Knowledge center	Best practices	Social network analysis	Discussions with customers
Technical report	Knowledge	Story telling	Coupling older and younger

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	documenting and experiences		employees

Then, using questionnaire design end sending them to a number of professors in universities in industrial and management fields we attempted to identification and selection of useful tools for knowledge management in small and medium knowledge enterprises in country. In this questionnaire five-point Likert item (1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high) was used. According to the results of the 11 questionnaires that came to us 7-fold tools (Table (2)) as useful tools for knowledge management in small and medium firms were found.

Table (2): widely used tools for knowledge management in small and medium enterprises

After action review	Technical report
Training	Visiting exhibitions
Job Rotation	Expert advices
Coupling older and younger employees	

The brief description of each of these tools is given.

After action review
These tools first were developed by America's Army and were exploited. In this knowledge management tool, individuals involved in the issue gather together and to discuss, review and exchange offer after any operation or project. This review can be formal or informal, short, as long as several minutes or several days to be done. After action review is also the best tool to convert tacit knowledge to explicit knowledge and knowledge sharing.

Technical report
In many organizations the work done by experts to be documented after work and this resulted in the loss of much of the information. Therefore technical report is one of the devices to gather tacit knowledge in organizations.

Training
Training is systematic and continuous improvement of employees' knowledge, skills and behaviors that helps to their welfare and their organizations. Training Courses are calculated periods with clear targets in order to improve knowledge or skills in the organization and therefore typically have a high efficiency.

Visiting exhibitions
Visiting exhibitions are one of the identification and knowledge acquisition tools from outside the organization. These tools are used more than other knowledge-based companies. Beijerse in his paper is referred to use of these tools by Dutch companies [6].

Job Rotation
Job rotation is a process in which employees at different levels of an organization move their duty. With rotation in jobs is increased individual knowledge and experience. Also fatigue and boredom of the soul, is diminished and this is leading to intellectual transformation and creativity and innovation.

Expert advices
The purpose of this tool is a systematic and continuous use of expert's opinions in dealing with

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problems. In situations where this tool to be systematically implemented in the organization, people know that how can access to professional views of experts within the organization, belonged to the organizations or outside the organization in dealing with complicated problems [22].

Coupling older and younger employees
This method can benefit to organization in two ways. With this method, young employees are training along experienced staff and benefit from their tacit knowledge and experience. On the other hand the experienced stuff will be familiar with academic and updated knowledge of young employees and enhance their capabilities [6].

1-4 Fuzzy AHP
Basis of hierarchical analysis process is the paired comparisons. This technique was invented by "Thomas L Saaty" and then much has been used for multi criteria decision making [24]. For decision making and the choice among several available options, this approach compared them in pairs based on given criteria and brings their preference on each other in any criterion and after applying the weight of criteria in the results, an option that has the highest score, is selected. This technique is based on four principles that are the reverse condition, the principle of homogeneity, the principle of dependence and expectations filed [15].

1-4-1TOPSIS
TOPSIS method was introduced in 1981 by Hwang and Yoon for the first time [31]. A view of TOTSIS approach to multi criteria decision making problem is geometrical such that considers M alternative as M point in an N-dimensional space of criteria. This method is based on the view that selected alternative must have minimum distance from positive ideal solution (PIS) and have maximum distance from negative ideal solution (NIS). Other features of TOPSIS is its ability to adapt different criteria with different units simultaneously.

1-4-2 Fuzzy Numbers
Fuzzy numbers are a subset of real numbers that in fact, are extended from the confidence intervals idea. By definition, a triangular fuzzy number (TFN) must have the following basic features. Fuzzy number A is a triangular fuzzy number on R if the member function $\mu_{\tilde{A}}(x): R \to [0,1]$ is as follows.

$$\mu_{\tilde{A}}(x) = \begin{cases} (x-L)/(M-L), & L \le x \le M \\ (U-x)/(U-M) & M \le x \le U \\ 0 & otherwise \end{cases} \qquad (1)$$

L and U are respectively top and bottom boundary of $\tilde{A}$ (Figure 1).We show a triangular fuzzy number with $\tilde{A} = (L, M, U)$ and operational rules two fuzzy numbers is as following.

Summation of fuzzy numbers $\oplus$

$$\tilde{A}_1 \oplus \tilde{A}_2 = (L_1, M_1, U_1) + (L_2, M_2, U_2)$$
$$(L_1 + L_2, M_1 + M_2, U_1 + U_2) \qquad (2)$$

Multiplication of fuzzy numbers $\otimes$

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$$\tilde{A}_1 \otimes \tilde{A}_2 = (L_1, M_1, U_1) \otimes (L_2, M_2, U_2)$$
$$(L_1 L_2, M_1 M_2, U_1 U_2) \qquad (3)$$

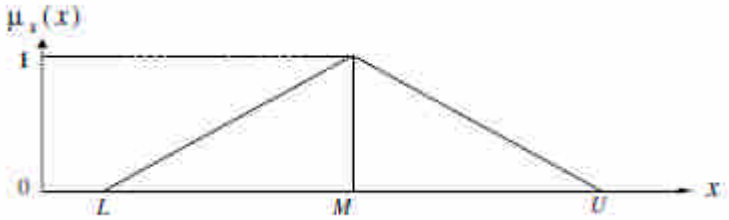

Figure 1: Membership function of triangular fuzzy numbers

Subtraction of fuzzy numbers -

$$\tilde{A}_1 - \tilde{A}_2 = (L_1, M_1, U_1) - (L_2, M_2, U_2)$$
$$(L_1 - U_2, M_1 - M_2, U_1 - L_2) \qquad (4)$$

Division of fuzzy numbers ϕ

$$\tilde{A}_1 \phi \tilde{A}_2 = (L_1, M_1, U_1) \phi (L_2, M_2, U_2)$$
$$(L_1 / U_2, M_1 / M_2, U_1 / L_2) \qquad (5)$$

Reverse of fuzzy numbers

$$\tilde{A}_1^{-1} = (L_1, M_1, U_1)^{-1} = (1/U_1, 1/M_1, 1/L_1) \qquad (6)$$

1-4-3 Linguistic variables

Based on statements of Zadeh, quantifying in traditional method, in logical expression for situations that are defined very hard, is very hard. Thus the linguistic variables in such situations are essential [30]. Linguistic variable is a variable that its value is a word or phrase in natural or artificial language. Here we use from 5 linguistic expression in fuzzy scale that are equally important, a little more important, more important, very important and absolutely important (Figure 2). In this paper the computational method is based on fuzzy numbers that are presented in Table 3. Here every membership function is defined by three parameters of triangular fuzzy numbers.

Table 3: Membership functions of linguistic scales

Fuzzy number	Linguistic variable	Scale of fuzzy numbers
9	Absolutely important	(8, 9,10)
8	Very very important	(7, 8,9)
7	Much important	(6, 7,8)
6	Very important	(5, 6,7)

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5	Important	(4, 5,6)
4	Relatively important	(3, 4,5)
3	Little important	(2, 3,4)
2	Too little important	(1, 2,3)
1	Equally important	(1, 1,1)

1-4-4 Fuzzy AHP and Fuzzy TOPSIS integrated method

In first step, in order to determine the weight of evaluation criteria by FAHP, following are performed. At the first we will establish matrix of paired comparisons to criteria for dimensions of a hierarchical system. Then we ask from respondents to use linguistic expressions to compare paired criteria that to be determined which of criteria are most important.

$$\tilde{A} = \begin{bmatrix} 1 & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ \tilde{a}_{21} & 1 & \cdots & \tilde{a}_{1n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{a}_{n2} & \tilde{a}_{n2} & \cdots & 1 \end{bmatrix} = \begin{bmatrix} 1 & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ 1/\tilde{a}_{21} & 1 & \cdots & \tilde{a}_{1n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/\tilde{a}_{n2} & 1/\tilde{a}_{n2} & \cdots & 1 \end{bmatrix} \quad (7)$$

So,

$$\tilde{a}_{ij} = \begin{cases} \tilde{1},\tilde{3},\tilde{5},\tilde{7},\tilde{9} & \text{Criteria i is more important than criteria j} \\ 1,\ i = j & \\ \tilde{1}^{-1},\tilde{3}^{-1},\tilde{5}^{-1},\tilde{7}^{-1},\tilde{9}^{-1} & \text{Criteria j is more important than criteria i} \end{cases}$$

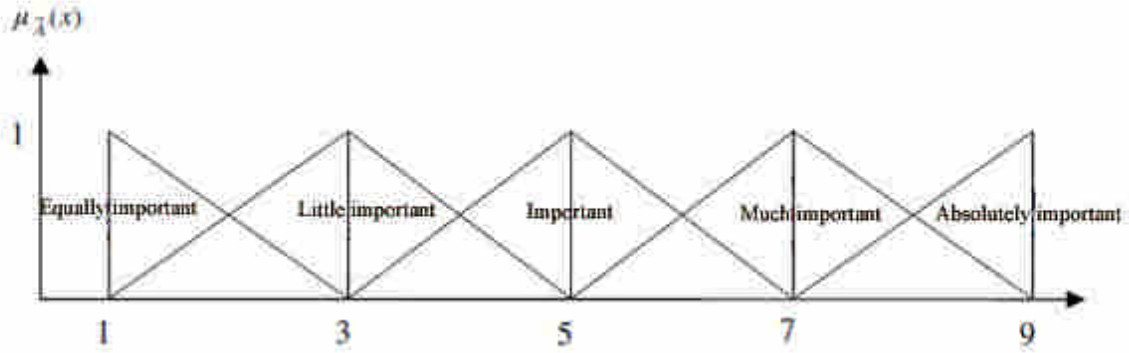

Figure 2: Membership functions of linguistic variables to compare the two criteria

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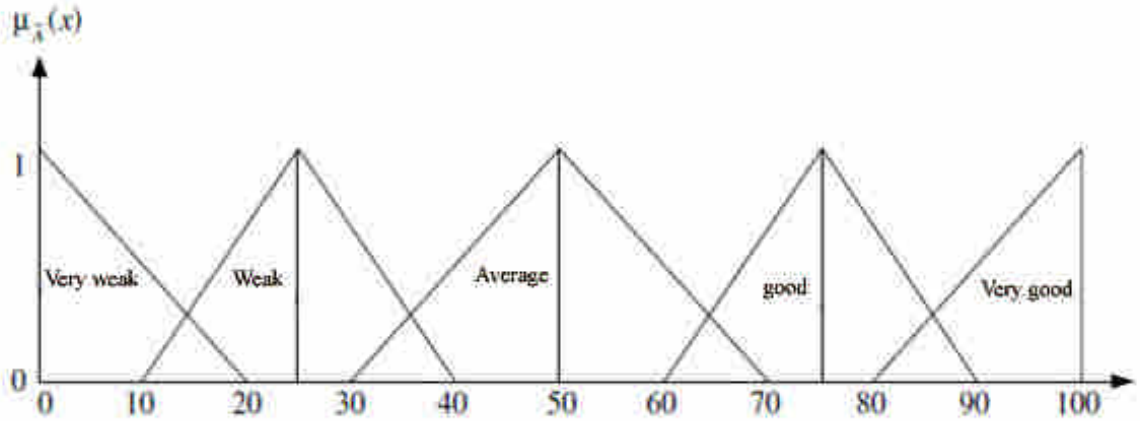

Figure 3: Example of membership functions of linguistic variables to assess the performance options

For use of the geometric mean techniques to determination of fuzzy geometric mean and fuzzy weight of each criterion, we act in following way [10]:

$$\tilde{r}_i = (\tilde{a}_{i1} \otimes \tilde{a}_{i2} \otimes ... \otimes \tilde{a}_{in})^{1/n}, \qquad (8.2)$$

$$\tilde{w}_i = \tilde{r}_i \otimes (\tilde{r}_1 \oplus ... \oplus \tilde{r}_n)^{-1} \qquad (8.1)$$

As $\tilde{a}_{in}$ is the criteria to compare i relative to n criteria. Thus $\tilde{r}_i$ is the value of fuzzy geometric mean for i criteria relative to any other criteria. $\tilde{w}_i$ is the fuzzy weights of i-th criteria and can be represented by $\tilde{w}_i = (Lw_i, Mw_i, Uw_i)$, that is a triangular fuzzy number.

1-4-5 Defuzzification of resulting weights

The weights themselves are fuzzy, therefore, using the COA, the BNP, which is the defuzzy value of criteria can be calculated.

$$BNP_i = [(UR_i - LR_i) + (MR_i - LR_i)]/3 + LR_i \quad \forall i \qquad (9)$$

According to the BNP for the weight of each criterion, ranking criteria can be achieved.

1-4-6 Fuzzy TOPSIS method steps

After determining the evaluation criteria weight we will establish an fuzzy decision-performance matrix and choose the appropriate linguistic variables to represent the performance of criteria by phrases such as, very good, good, average, weak, very weak. Each linguistic variable can be specified like figure 3 between scales of 0 to 100. Moreover, evaluators can determine the range of their linguistic variables as subjective. In this study we use from mean term to integration of fuzzy judgment values of k evaluators.

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$$\tilde{D} = \begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_m \end{array} \begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \dots & C_n \end{array} \\ \begin{bmatrix} \tilde{x}_{11} & \tilde{x}_{12} & \dots & \tilde{x}_{1n} \\ \tilde{x}_{21} & \tilde{x}_{22} & \dots & \tilde{x}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{x}_{m1} & \tilde{x}_{m2} & \dots & \tilde{x}_{mn} \end{bmatrix} \end{array} \qquad (10)$$

$i = 1,2,...,m; \; j = 1,2,...,n$

$$\tilde{x}_{ij} = \frac{1}{k}(\tilde{x}_{ij}^1 \oplus \dots \oplus \tilde{x}_{ij}^k \oplus \dots \oplus \tilde{x}_{ij}^K)$$

In this relation, $\tilde{x}_{ij}^k$ is the performance rate to AI item according to CJ criteria that has been evaluated by the K-th evaluators and are shown,

$$\tilde{x}_{ij}^k = (l_{ij}^k, m_{ij}^k, u_{ij}^k) \qquad (11)$$

Now we normalized fuzzy decision matrix. This matrix is shown as follows:

$$\tilde{R} = [\tilde{r}_{ij}]_{m \times n}, \; i = 1,2,...,m; \; j = 1,2,...,n \qquad (12)$$

The following formula is used in order to normalization:

$$\tilde{r}_{ij} = \left(\frac{l_{ij}}{u_j^+}, \frac{m_{ij}}{u_j^+}, \frac{u_{ij}}{u_j^+} \right), \; u_j^+ = \max_i \{u_{ij} \mid i = 1,2,...,n\} \qquad (13)$$

Therefore, after normalization, the obtained value of r_{ij} for the largest amount u_{ij} will be equal to 1.

It should be noted that the normalized matrix r_{ij} is still a triangular fuzzy matrix.
The next step, we calculate the weighted normalized fuzzy decision matrix and will display as follows:

$$\tilde{V} = [\tilde{v}_{ij}]_{n \times n}, \; i = 1,2,...,m; \; j = 1,2,...,n \qquad (14)$$
$$\tilde{v}_{ij} = \tilde{r}_{ij} \otimes \tilde{w}_j$$

Then calculate the fuzzy positive ideal solution (FPIS) and fuzzy negative ideal solution (FNIS).
According to matrix weighted normalized fuzzy decision, we know that the elements v_{ij} are also normalized positive triangular fuzzy numbers and are located in closed interval [0, 1].So we can defined fuzzy positive ideal solution A^+ and the fuzzy negative ideal solution A^- as follows:

$$A^+ = (\tilde{v}_1^*, ..., \tilde{v}_j^*, ..., \tilde{v}_n^*) \qquad (15)$$
$$A^- = (\tilde{v}_1^-, ..., \tilde{v}_j^-, ..., \tilde{v}_n^-) \qquad (16)$$
$$\textit{where} \quad \tilde{v}_j^* = (1,1,1) \otimes \tilde{w}_j = (lw_j, mw_j, uw_j) \quad \textit{and} \quad \tilde{v}_j^- = (0,0,0), \; j = 1,2,...,n.$$

In this step, we calculate distances of any alternative from A^+ and A^- using area compensation method.

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$$\tilde{d}_i^{+} = \sum_{j=1}^{n} d(\tilde{v}_{ij}, \tilde{v}_j^{*}) \ , \ i = 1,2,...,m \ ; \ j = 1,2,...,n \qquad (17)$$

$$\tilde{d}_i^{-} = \sum_{j=1}^{n} d(\tilde{v}_{ij}, \tilde{v}_j^{-}) \ , \ i = 1,2,...,m \ ; \ j = 1,2,...,n \qquad (18)$$

Where d is distance measurement between two fuzzy numbers and calculated from the following formula:

$$d(\tilde{\rho}, \tilde{\tau}) = \sqrt{\frac{1}{3}[(\rho_1 - \tau_1)^2 + (\rho_2 - \tau_2)^2 + (\rho_3 - \tau_3)^2]} \qquad (19)$$

Finally, we calculate the closeness coefficients that are defined as follows:

$$\tilde{CC}_i = \frac{\tilde{d}_i^{-}}{\tilde{d}_i^{+} + \tilde{d}_i^{-}} = 1 - \frac{\tilde{d}_i^{+}}{\tilde{d}_i^{+} + \tilde{d}_i^{-}}, \qquad i = 1,2,...,m \qquad (20)$$

1-5 Evaluation of the results of knowledge-**based** companies located in the Iran science and technology parks

In this study in order to evaluate the impact of knowledge management tools empowering employees, a questionnaire was designed and was send to knowledge based companies located in Iran science and technology parks to available options in the research framework that are shown in Figure 4 to be studied. This framework is made from 5 criteria and 7 alternatives.

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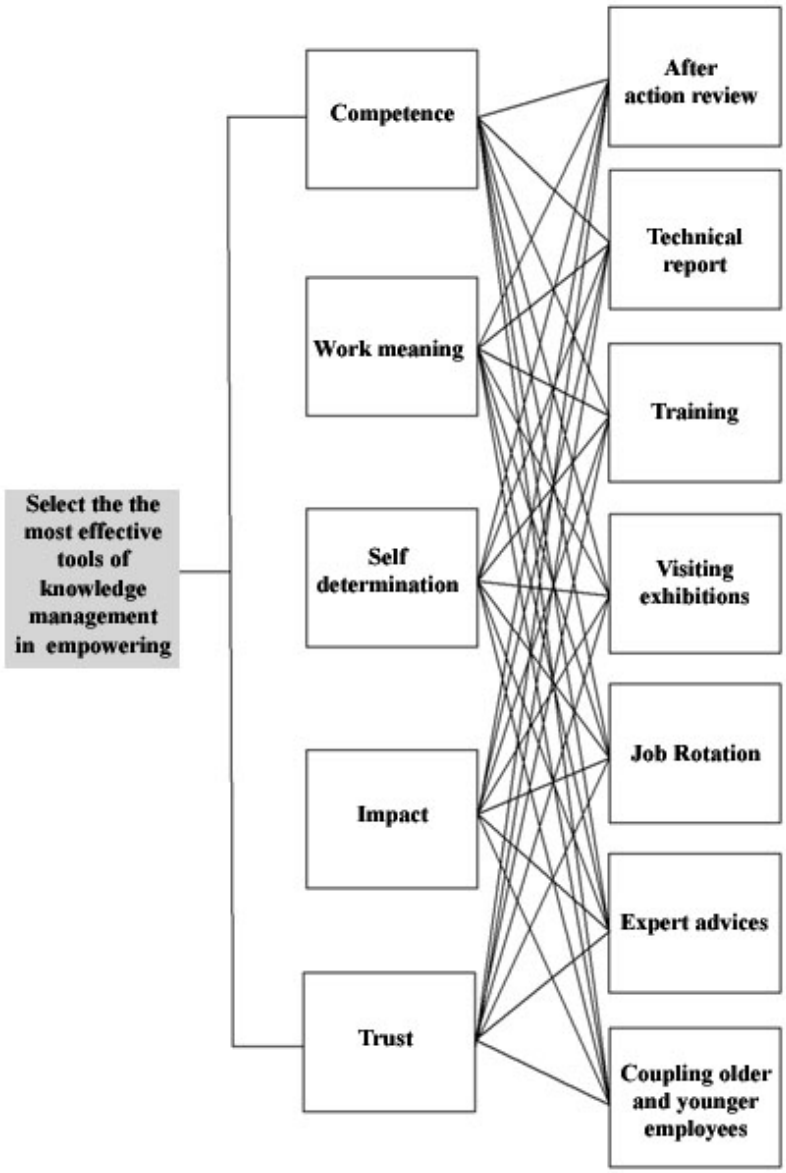

Figure 4: framework of research

1-5-1 weight of criteria calculation

Generally, 43 questionnaires came to us. After creating a hierarchy, we calculate the weight of each criteria and alternative using fuzzy AHP method. In the first step, we calculate matrix of paired comparisons using relations (7 and 8.1) that results are shown in Table (4).

Table 4: Paired comparisons fuzzy matrix

	Work meaning	Competence	Self determination	Impact	Trust
Work meaning	Equally important	(0.2552,03209,04374)	(1.765,2.393,3.154)	(0.4830,0.6756,0.8333)	(3.101,4.032,4.963)
Competence	(2.286,3.116,3.918)	Equally important	(2.614,3.271,4.31)	(1.343,2.187,2.893)	(3.374,4.22,5.069)
Self determinat	(0.3170,0.4178,0.56656)	(0.2320,0.3057,0.3825)	Equally important	(0.2803,0.3456,0.4488)	(1.659,2.286,2.956)

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ion					
Impact	(1.2,1.48,2.07)	(0.3456,0.4591,0.7446)	(2.228,2.886,3.567)	Equally important	(2.88,3.726,4.578)
Trust	(0.2014,0.2480,0.3224)	(0.1972,0.2369,0.2963)	(0.3382, 0.4374,0.6027)	(0.2184,0.2683,0.3472)	Equally important

The next step, the weight of each dimension was calculated. Note that to calculate the weight of each dimension, calculation of r_i is necessary.

r_1: (0/9243,1/1590,1/4166), r_2: (1/9342,2/4813,3/0113), r_3: (0/5091,0/6324,0/7793),
r_4: (1/2162,1/4884,1/9062), r_5: (0/3115,0/3695,0/4572)

Then using equation (8.2) the values of w_i are calculated. These values are:

w_1: (0/1220,0/1890,0/2893), w_2: (0/2554,0/4047,0/6151), w_3: (0/0672,0/1031,0/1591),
w_4: (0/1606,0/2427,0/3893), w_5: (0/0411,0/0602,0/0934)

Then we calculate BNP using equation (9). The calculated values of BNP are shown in Table 5.

Table 5: Dimensions Weights

rank	BNP	Weights	Empowering dimensions
3	0/2001	(0/1220,0/1890,0/2893)	**Work meaning**
1	0/6151	(0/2554,0/4047,0/6151)	Competence
4	0/1591	(0/0672,0/1031,0/1591)	**Self determination**
2	0/3893	(0/1606,0/2427,0/3893)	**Impact**
5	0/0649	(0/0411,0/0602,0/0934)	**Trust**

1-5-2 predicting the performance of knowledge management tools

In this paper our goal is finding the most efficient tools for knowledge management that affects on employee empowerment. Therefore, were asked from number of evaluators (respondents) to express their opinions using linguistic variables. Since each person has a specific range of meaning for its use of linguistic variables and may tow equal linguistic expressions from tow evaluators have different purposes, thus we create a database to the linguistic expressions for each respondent. This database is given in Table (6).

Table 6: Results of evaluator's personal understanding of the linguistic variables

linguistic variables					evaluator
Very low	Low	Average	High	Very High	
(0,10,20)	(20,35,50)	(50,65,80)	(80,85,90)	(90,95,100)	1

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(5,10,15)	(15,35,55)	(55,65,75)	(75,80,85)	(85,95,100)	2
(0, 10,30)	(30,40,50)	(50,60,70)	(70,80,90)	(90, 95,100)	3
(0,0,10)	(10,15,20)	(20,30,40)	(40,60,80)	(80,90,100)	4
(5, 7,12)	(13,25,38)	(37,50,62)	(63,75,88)	(88, 93,100)	5
(0,20,40)	(40,50,60)	(60,70,80)	(80,85,90)	(90,95,100)	6
(5, 15,25)	(40,50,60)	(60,70,80)	(70,80,90)	(85,90,100)	7
(0,15,30)	(30,45,60)	(60,65,70)	(70,75,80)	(80,90,100)	8
(0,10,20)	(20,35,50)	(50,55,60)	(60,70,80)	(80,90,100)	9
(5,15,25)	(25,30,35)	(35,40,55)	(55,65,75)	(70,85,100)	10
(10,20,35)	(30,40,45)	(50,60,70)	(75,80,85)	(85, 90,100)	11
(0,0,15)	(15,30,45)	(45,60,75)	(75,80,90)	(90,100,100)	12
(0,5,10)	(10,20,30)	(30,45,55)	(55,70,90)	(90,95,100)	13
(10,20,30)	(30,40,50)	(50,55,60)	(60,65,70)	(70,85,100)	14
(0,20,40)	(40,45,50)	(50,55,60)	(60,65,70)	(70,80,100)	15
(0,0,40)	(40,50,60)	(60,70,80)	(80,85,90)	(90,100,100)	16
(5,10,15)	(15,25,35)	(35,45,55)	(55,65,75)	(75,90,100)	17
(0,20,40)	(40,45,50)	(50,55,60)	(60,70,80)	(80,90,100)	18
(0, 10,15)	(30,40,45)	(50,60,65)	(70,80,85)	(80, 90,100)	19
(0,15,20)	(20,30,40)	(40,50,60)	(60,75,90)	(90,95,100)	20
(0,10,25)	(25,35,45)	(55,60,65)	(65,70,75)	(75,85,100)	21
(10,25,40)	(40,50,65)	(65,75,80)	(80,85,90)	(85, 85,90)	22
(0,5,10)	(10,15,20)	(20,40,60)	(60,75,90)	(90,95,100)	23
(0,0,19)	(15,27,43)	(38,48,65)	(60,78,90)	(88,100,100)	24
(5,15,25)	(25,35,45)	(45,60,75)	(75,80,85)	(85,90,100)	25
(0,10,20)	(20,30,40)	(40,50,60)	(60,75,90)	(90,95,100)	26
(0,15,20)	(20,30,35)	(35,45,55)	(55,65,80)	(80,90,100)	27
(5, 10,20)	(20,30,50)	(55,58,63)	(70,78,86)	(85, 90,100)	28

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(0,10,20)	(20,30,40)	(40,50,60)	(60,70,80)	(80,90,100)	29
(10,15,20)	(20,30,40)	(40,55,70)	(70,80,90)	(90,95,100)	30
(0,10,20)	(20,30,40)	(40,50,60)	(60,75,90)	(90,95,100)	31
(45,50,55)	(55,60,65)	(65,70,75)	(75,80,85)	(85, 90,95)	32
(0,10,20)	(20,20,30)	(30,40,50)	(50,60,70)	(70,85,100)	33
(0, 20,40)	(40,50,60)	(60,70,80)	(80,85,90)	(90, 95,100)	34
(15,20,25)	(25,35,45)	(45,60,75)	(75,80,85)	(85,95,100)	35
(0,20,40)	(40,45,50)	(50,60,70)	(70,80,90)	(90,95,100)	36
(0,0,25)	(10,30,50)	(30,50,70)	(65,75,85)	(80,100,100)	37
(0,10,20)	(20,30,40)	(40,45,50)	(50,55,60)	(60,80,100)	38
(0, 20,40)	(30,45,60)	(55,65,75)	(75,85,95)	(90, 95,100)	39
(10,20,30)	(30,40,50)	(50,60,70)	(70,80,90)	(90,95,100)	40
(0,10,20)	(20,25,30)	(30,40,50)	(50,70,90)	(90,95,100)	41
(0,0,20)	(20,30,40)	(35,45,70)	(70,80,90)	(85,100,100)	42
(0,15,30)	(30,35,40)	(40,50,60)	(60,70,80)	(80,90,100)	43

Mean value of the fuzzy performance criteria for alternative is given in Table (7).

Table 7 : Mean value of the fuzzy performance criteria

	After action review	Technical report	Training	Visiting exhibitions	Job rotation	Expert advices	Coupling older and younger employees
Meaning	(77.3,83.6,90.2)	(70.5,76.8,85.5)	(67.2,73.3,77.3)	(64.8,73.3,81.5)	(59.5,63.7,71.6)	(70.1,75.6,83.4)	(61.5,72.3,84.5)
Competency	(66.3,72.8,81.5)	(65.7,75.3,81.9)	(75.8,83.3,90.1)	(59.5,68.5,78)	(65.5,71.3,81.1)	(32.8,48.8,56.3)	(76.6,80.1,90.4)
Choice	(35.2,.45.8,55.1)	(55.3,68.9,72.3)	(47.8,57.8,63.3)	(53.2,64.1,69.6)	(54.3,59.8,65.5)	(51.7,62.2,70.1)	(48.7,63.3,71.2)
Impact	(46.6,49.7,52.5)	(63.5,71.8,79.3)	(69.3,71.7,75.4)	(51.7,62.3,70.7)	(61.7,66.2,76.6)	(60.6,68.2,75.1)	(54.8,61.3,71.8)
Trust	(67.8,78.883.3)	(50.7,60.4,70.2)	(57.8,63.5,70.1)	(63.8,74.1,83.1)	(44.1,47.3,53.9)	(65.7,71.3,79.8)	(77.6,85.3,93.1)

Now, using relations (13), we normalized fuzzy decision matrix. Results are shown in Table 8.

Table 8: The normalized fuzzy decision matrix

	After action review	**Technical report**	**Training**	**Visiting exhibitions**	**Job rotation**	**Expert advices**	**Coupling older and younger employees**
Meaning	(0.830,0.897,0.968)	(0.757,0.824,0.918)	(0.721,0.778,0.830)	(0.696,0.786,0.875)	(0.639,0.684,0.769)	(0.752,0.812,0.895)	(0.661,0.776,0.907)
Competency	(0.712,0.781,0.875)	(0.705,0.808,0.879)	(0.814,0.894,0.967)	(0.639,0.735,0.837)	(0.703,0.765,0.871)	(0.352,0.524,0.604)	(0.822,0.861,0.971)
Choice	(0.378,0.419,0.591)	(0.593,0.740,0.776)	(0.513,0.620,0.679)	(0.571,0.688,0.747)	(0.583,0.642,0.703)	(0.555,0.668,0.752)	(0.523,0.679,0.764)
Impact	(0.501,0.533,0.563)	(0.682,0.771,0.851)	(0.744,0.770,0.809)	(0.555,0.669,0.759)	(0.662,0.711,0.822)	(0.651,0.732,0.806)	(0.588,0.658,0.771)

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Trust	(0.728,0.846,0.894)	(0.544,0.648,0.754)	(0.620,0.682,0.752)	(0.685,0.795,0.892)	(0.473,0.508,0.578)	(0.705,0.765,0.857)	(0.833,0.916,1)

after that, by using equation (14) we establish the weighted normalized fuzzy-decision matrix. The results are shown in table 9.

Table 9:Weighted normalized fuzzy-decision matrix

	After action review	**Technical report**	**Training**	**Visiting exhibitions**	**Job rotation**	**Expert advices**	**Coupling older and younger employees**
Meaning	(0.101,0.169,0.280)	(0.092,0.155,0.265)	(0.088,0.147,0.240)	(0.085,0.148,0.253)	(0.077,0.129,0.223)	(0.091,0.153,0.258)	(0.081,0.144,0.262)
Competency	(0.182,0.316,0.538)	(0.180,0.326,0.540)	(0.207,0.361,0.594)	(0.163,0.297,0.514)	(0.179,0.309,0.535)	(0.089,0.212,0.371)	(0.209,0.348,0.597)
Choice	(0.025,.043,0.094)	(0.039,0.076,0.123)	(0.034,0.063,0.108)	(0.038,0.071,0.118)	(0.039,0.066,0.112)	(0.037,0.068,0.119)	(0.035,0.070,0.121)
Impact	(0.080,0.129,0.219)	(0.109,0.187,0.331)	(0.119,0.187,0.314)	(0.089,0.162,0.295)	(0.106,0.173,0.320)	(0.104,0.177,0.313)	(0.094,0.159,0.300)
Trust	(0.030,0.051,0.083)	(0.022,0.039,0.047)	(0.025,0.041,0.067)	(0.028,0.047,0.084)	(0.019,0.031,0.054)	(0.028,0.046,0.080)	(0.034,0.055,0.093)

Now, we can determine the fuzzy positive-ideal solution (FPIS) and the fuzzy negative-ideal solution (FNIS).so according to equation (15,16) we can calculate A^+ and A^-.

A^+=((0.1220,0.1890,0.2893), (0.2554,0.4047,0.6151), (0.0672,0.1031,0.1591), (0.1606,0.2427,0.3893), (0.0411,0.0602,0.0934))

A^-=((0,0,0), (0,0,0), (0,0,0), (0,0,0), (0,0,0))

At the end we calculate the distances from FPIS and FNIS. After that the closeness coefficient. The results of this step are shown in table (10).

Table 10: Closeness coefficients an ranking the alternatives

	D1	D2	Cc+	cc-
Coupling older and younger employees	0.202	0.948	0.175	0.824
Training	0.204	0.933	0.179	0.821
Technical report	0.223	0.916	0.195	0.804
Visiting exhibitions	0.268	0.873	0.234	0.765
Job rotation	0.277	0.861	0.243	0.756
After action review	0.292	0.847	0.256	0.743
Expert advices	0.352	0.788	0.308	0.691

As it is obvious in table (10), two knowledge management namely, "coupling older and younger employees" and "training" have maximum influence on staff empowerment. In the other hand "job rotation", "after action review" and "Expert advices" had the least influence.

1-6 Conclusion

According to the questionnaires, "coupling older and younger employees" is the most effective tool in empowering the staff. This method is one of ancient and conventional way of staff empowerment. Although respondents were people who are working in knowledgebase companies, but, seems that this method is very effective yet and have more conformity with Iranian culture. So this relatively cheap way of staff empowering should widely use in Iran.

After "coupling older and younger employees", "training" is ate second rank. This way is very similar to "coupling older and younger employees"; the different is only in extent of formality of knowledge transfer. "Training" is more formal.

"Technical report" is at the third place. This tool has a great influence on documentation and knowledge storage in organizations, and most of companies use this tool for this aim, but results show the considerable impact of this tool on staff empowering. Unfortunately in Iran, many companies, don't care enough to this tool, with respect to the results using this tool could help company in both staff empowering and preventing knowledge lost.

"Visiting exhibitions", "job rotation", "after action review" and "Expert advices" are in the next ranks. The considerable point is the rank of "job rotation". In many studies in human resource management in field of staff empowering, "job rotation" considered as a powerful tool, but this research shows that,

there are some more powerful tools. At least we could say that in knowledgebase organizations, "job rotation" is not an effective tool to empower staff in comparison with other tools. This subject could be a good item for further research in this field.

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The Impact of Management Information Systems (MIS) on Quality Assurance (QA): A Case Study in Jordan

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Abstract

In order to apply the essential processes for reaching suitable values of quality, then standards of Capability Maturity Model Integration (CMMI) model could be used. This paper concentrates on the place of measurement within the quality assurance; particularly in software development as part of MIS by reviewing the measurements of CMMI. Case study in X company in Jordan through measuring its level of service and client feedback was implemented. The study applies CMMI maturity level 2, maturity, by collecting specified data from clients, quality documents by using interviews with selected customers. This study found that the software industry can avoid serious problems of software development, if organizations measure information categories in the early stages of software development project. Information categories include service continuity; capacity; service quality; service performance; availability; and reliability.

Keywords: MIS, Software Development, QA, CMMI, Jordan

1. Introduction

Recently there has been an increasing attention to quality assurance that facilitates gaining several advantages for the organization, improving competitiveness, and guaranteeing client satisfaction. In order to get these advantages, organizations should use proper strategies to insure the quality standards of their products besides the perceived services. Furthermore, organizations need using standards and models to confirm that business objectives are achieved as planned, and applied appropriately to measure the output compatibility with necessities, in addition to improving the quality requirements continuously. Indeed, in the science of management, quality discipline has developed quickly mainly in services and products as a way to become a main factor in providing any kind of services or promote products, especially in software industry and development. However, the meaning of quality differs. For instance, in construction, aesthetics, cost and time consider as the key dimensions (Hellard, 1991; Huang and Han, 2006), whereas in industrializing, engineering and business, it has a pragmatic interpretation as the non-inferiority or superiority of something (Lin, et al, 2012). Indeed, quality is one of the key organisational innovations of the twentieth century, which has contributed a

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methodically grounded methodology to focus attention on customers (Lillrank, 2002). Also, the implementation of quality in trade today is developed from the early stages of quality control and assurance (Maguad, 2006). Ashcroft and Foreman-Peck (1996) supposed that Quality Assurance (QA) frequently pass on to the issue of standards more than ever as they link to the consistency of result measures, although there is a difference between quality and standards (Harvey and Green, 1993). Further, quality and standards are frequently discussed in the literature in a decontextualized method, however, definitions of quality and standards cannot be isolated from the principles that support them and the traditions in which they are operationalized in institutional and individual practice (Ashcroft and Foreman-Peck, 1996).

Rahman and Raihan (2005) reviewed QA as the action performed on products or services in the manufacturing companies that determined the quality attributes. All those designed or methodical attributes and events needed to give an adequate assurance which result on a service that satisfy pre-agreed requirements for QA. Moreover, quality assurance is the procedure of providing facts needed in order to create assurance (i.e. performing all processes in organization that quality-related actions are created and performed well). QA can help organisation to improve many fields of how business development re-engineering help quality, cost, price and speed (Hammer and Champy, 1993; Dhaliwal et al, 2011). Based on CMMI for Development- version 1.3, quality assurance must start in the early phases of work to start plans, processes, standards, and procedures that will add value to the work and satisfy the requirements of the work and organizational policies. But as quality assurance in software development field can work with reviews, testing, measurement, standards, and procedures; software quality assurance (SQA) considered as a way of monitoring the software development lifecycle processes and methods used to ensure quality such as ISO 9000 or CMMI (Capability Maturity Model Integration) for agile software development (Wikipedia, 2012). Also, agile software development methods are used to create high quality software in shorter period of time (Livermore, 2008). This paper considers how measurement plays a crucial role in the quality process, and how measurement is used in CMMI by applying it as a case study in Jordan. Then, the pros and cons of

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introducing measurement into an agile software development environment are discussed. Finally, conclusions, implications, and recommendations are provided at the end.

2. Measurement in the Quality Process

While quality was measured in terms of scrap and rework rate, delivery performance, cost of poor quality, and customer satisfaction with product and service quality (Kaynak, 2003); based on CMMI for Service - version 1.3, when discussing the quality assurance processes, the activities that should be taken into consideration are objectively evaluating performed processes and work products against applicable process descriptions, standards, and procedures; identifying and documenting noncompliance issues; providing feedback to work group staff and managers on the results of quality assurance activities; and ensuring that noncompliance issues are addressed. Together measurement, analysis and improvement play a key part in quality processes. However, over the last years the significance of improving the software process, the design of software is being emphasized by models (Balla, 2001; Petersen, 2011) such as the Capability Maturity Model (CMM), Capability Maturity Model Integration (CMMI), Software Process Improvement and Capability dEtermination (SPICE), Software Process Assessment (SEI), ISO 9001:2000, ISO 12207 and Allied Quality Assurance Publications (AQAP).

In addition, the models of quality measurement require data gathering through customer satisfaction, and auditing of the quality processes for products or services. Nonetheless, software measurement aims to measure and analyse the quality processes through analyzing and measuring the customer satisfaction construct by discussing collected customer satisfaction data and information, and applying techniques and models for testing customer satisfaction data or products in a way as to describe them according to clearly defined rules, then are tuned to practice of software development (Trienekens, et al, 2005; Kirk and Tempero, 2012). Nevertheless, software quality assurance must include not only standards, plans, management systems, policies and procedures because none of these approaches,

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standards or models covers all the perspectives on software quality improvement; companies have to choose the right approach based on their specific business needs (Trienekens, et al, 2005; Kirk and Tempero, 2012). These measurements, plans and schedules for software quality assurance activities are measured and should be part of the project plan to measure a project's evolution. Based on CMMI for Service - version 1.3, the processes measure a set of operations used to determine values of measurement of a process and its resulting products or services for the purpose of characterizing and understanding the process.

Ahmad, et al. (2010) argued that knowledge sharing, active stakeholder participation, self organizing teams, reduced documentation, responding to change, team size, flexible design, trainings and refactoring are the identified parameters which impact the productivity and quality of any software development project. However, measurement plays an important role in the quality process through understanding what is happening during development and maintenance, and it can make aspects of the process and product more visible. In addition, measurement plays an important role in the control process. This is to say that based on measurement organizations can predict what is likely to happen and make changes to processes and products to help them meet their goals; also measurement plays an important role in the improvement because it helps organizations to improve their future processes and products (Fenton and Pfleeger, 1998). Also, software measurement and analysis should consider quantitative and qualitative data for products and processes, than analyzing that data to influence plans. Measurement and analysis activities allow characterizing and gaining understanding of processes, evaluate to determine status with respect to plans, predict by understanding relationships among processes and improve by identifying roadblocks, root causes, inefficiencies, and other opportunities for improvement (SEI, 2011).

However, to enhance productivity and quality software, enterprises have to improve their production processes continuously through software process capability assessment. Following the capability

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maturity model developed by the Software Engineering Institute (Paulk, et al, 1995), and SPICE which is an international standard for software process assessment (SQI, 2011), improving the software process and design are used beside in software process improvement and process capability determination (SPICE). Also, Capability Maturity Model Integration (CMMI) and the capability maturity model from the Software Engineering Institute (SEI) facilitate in achievement regulatory maturity as the CMM structure helps companies to develop quality, timeliness and predictability of their software products gaining vital business advantage. The CMMI builds on and extends the most excellent practices of the CMM for software (SW-CMM), the Systems Engineering CMM (SE-CMM), and the Integrated Product and Process Development CMM (IPPD-CMM) (WIPRO, 2011).

3. How Measurement is Used in Quality Standards

CMMI (Capability Maturity Model Integration) is used as a method or an improvement approach that gives organizations the essential components of effective processes, which is able to improve their performance. CMMI-based method improvement includes identifying an organization's method strengths and weaknesses and creating methods for changes to overcome weaknesses and show strengths (SEI, 2011). Based on CMMI for Development- version 1.3, the first model of CMMs was proposed in 1993 namely CMM for software version1.1, then in 1995, CMM for system engineering version1.1 was issued, followed by CMM for International Council on Systems Engineering Systems Engineering Capability Assessment INCOSE SECAM in 1996. In 1997, CMM for integrated product development and CMM for software version 2 draft C were developed. After that, in 1998 Electronic Industries Alliance (EIA) standard 731, or the Systems Engineering Capability was issued followed by CMM for integrated product development version 1.02, then in 2002 CMM for software acquisition version 1.1 and version 1.03 were subjected. Next, in 2006, CMMI for development version 1.2 was proposed, and then in 2007 CMMI for acquisition version 1.2 was issued. In 2009, CMMI for services version 1.2 was issued, and finally in 2010, CMMI for acquisition version 1.3, CMMI for development version 1.3, and CMMI for services version 1.3 were subjected. Moreover, CMMI reflects maturity levels in its design and content. Each maturity level contains related specific and generic practices for

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predefined process areas that develop the organization's overall performance. Also, organizations do their best when they emphasise their process improvement efforts on a manageable number of process areas at a time. The maturity levels are measured by the achievement of the specific and generic goals connected with each predefined set of process areas.

Based on CMMI for Development- version 1.3, CMMI consists of five maturity levels namely initial; managed; defined; quantitatively managed; and optimizing. At maturity level 1, processes are usually ad hoc and confused. The organization generally does not deliver a stable environment to support the processes. Organizations declare success based on the competence and heroics of the people in the organization not on the use of verified processes. At the second maturity level, the projects of the organization have confirmed that processes are planned and executed in harmony with policy; and employ skilled people to produce controlled outputs. At maturity level 3, processes are characterized and understood very well, and are defined in standards, procedures, tools, and methods. The organization's standard processes are established and improved over time in order to establish consistency across the organization. At the fourth maturity level and based on the needs of the customer, end users, organization, and process implementers; organizations and projects establish quantitative objectives for quality and process performance and use them as criteria in managing processes. Quality and process performance is considered in statistical terms and throughout the life of the processes. Finally, maturity level 5 concentrates on continually improving process performance through incremental and innovative processes and technological improvements.

4. Research Method

Ethics in business research is considered to be one of the most important issues in any research including this study. This was supported and discussed by Bryman and bell (2003) who commented that invasion of privacy is a critical element in research. Complying with this and agreeing with the organization under study, the name of the organization would be kept confidential. For this, the organization will be referred as organization X. Accordingly, the researchers were given the permit to interview employees and look at documents concerning the studied subject. Pedrosa et al. (2012: 276)

defined the case study approach as: "[. . .] typically uses multiple methods and tools for data collection from a number of entities by a direct observer(s), in a single, natural setting that considers temporal and contextual aspects of the contemporary phenomenon under study, but without experimental controls or manipulations".

Furthermore, Gummesson (2008) stated that case study as a method in research can be used to gain insights into phenomena which are characterized by complexity in a wide sense. Following this, a case study approach was adopted in this study in which an in depth understanding of the quality assurance process within organization X was allowed. This helped the researchers to understand the whole process and achieve the purpose of this study by concentrating on the place of measurement within the quality assurance; particularly in software development by reviewing the measurements of CMMI.

As mentioned by Khatemende (2006), in any study, a researcher should be careful choosing the most appropriate research instrument in his/her research "in determining an appropriate research the crucial question is the extent to which one method contributes to a greater understanding than any alternative method would have done within a given time frame and level of academic thesis resource" (p. 99). Accordingly, taking into consideration the nature of the subject of this study, multiple sources were used to look at the nature of the role of measurement in quality assurance. This was done through a process of multiple triangulations (Obeidat, 2008). According to Patton (1990), triangulations lead to an increase in the reliability of the study. Furthermore, Obeidat (2008: 97) commented that triangulation leads "to increase the view that the responses of the questions were truthful (Denzin, 1989)". Taking into consideration the qualitative nature of this study, semi structured interviews were used as the main instrument to collect the data of this study (compare Bryman and Bell, 2003). Semi structured interviews were carried out with 55 employees. Documentations were used to support their arguments and answers of the interviews' questions.

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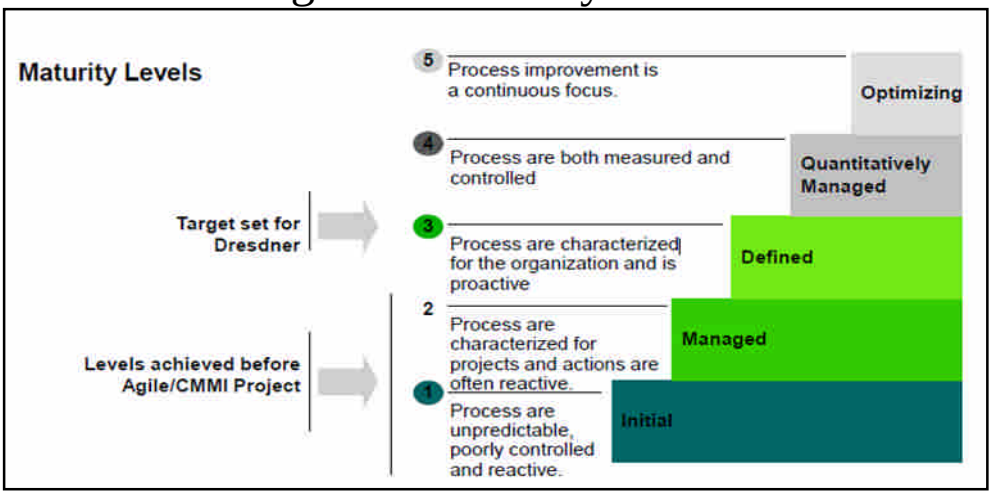
4.1. CMMI Maturity Level 2

Since the objective of this study is to examine the extent to which customer satisfaction level is reached in X company in Jordan by measuring its level of service and customer feedback; the study applies CMMI maturity level 2, maturity, by collecting the required data from customer, quality document by using interviews and arranging for meetings with selected customers. Further, as shown below in figure 1, agile is used in software development which refers to speed, activity and response, as it relies on building teams in organization and reflect importance of cooperation and interaction with customer, improving quality, reduce documentation and access to the market easily (Highsmith and Cockburn, 2001). Furthermore, agile methodology is helping to speed up production, finding simple solutions to suit with the changes, and improving design quality to avoid future problems. Phalnikar et al. (2009) described some characteristics of agile such as improving customer satisfaction through quick delivery of programs and frequently; making the required changes anytime; finding a close and daily cooperation between team members and stakeholders; projects built based on individuals motives and desires; continuous attention to design quality; and adapting with changing circumstances.

Figure 1. Maturity Levels



Moreover, although the cons of introducing measurement into an agile software development environment merely focus on project management and thus, it is difficult to deliver business objectives into agile software development measurement requirements; the pros are to provide managerial expectations for business objectives and performance with identified information needs and team work,

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organizational, and for providing quantity and quality results in agile software development. Also, to growing and sustaining a measurement capability used to support project management needs and managing information, measurement can be used in making decisions to support decision makers.

4.2. Case Study Measurement in CMMI at X Company in Jordan

This study shows how X company in Jordan uses the CMMI maturity level 2 to improve their quality, reduce their costs, optimize their schedules, and to gauge how well their process improvement program is working. This has been achieved by applying the below two steps: Align measurement and analysis activities; and provide measurement results.

4.2.1. Align Measurement and Analysis Activities at X Company

The purpose of measurement and analysis at X company is to develop and sustain a measurement capability used to support management information needs. This step is achieved as follows:

4.2.1.1. Establish Measurement Objectives that are derived from identified Information Needs and Objectives at X Company

The sources for measurement objectives may be management, technical, project, product, or process implementation needs. Further, setting up and maintaining measurement objectives are derived from known information needs and objectives through work plans at X company, work performance monitoring, interviews with employees and others who have valuable information at the company, recognized management objectives, the company's strategic and business plans, experiences of managerial entities, outside business benchmarks and process improvement plans. Some examples of measurement objectives are schedule fluctuations and progress, actual size compared to plan at X company, the company's recognize unplanned growth, evaluating the effectiveness of defect detection at the company throughout the product development lifecycle, deciding the cost of correcting defects, real costs compared to plan, estimate supplier progress against the plan at X company, and calculating

the effectiveness of mitigating information system vulnerabilities at the company.

4.2.1.2. Specify Measures to Address Measurement Objectives at X Company

Measurement objectives are refined into precise and quantifiable measures at X company. Examples of commonly used base measures include estimates and actual measures of work product size at X company such as number of pages; estimates and actual measures of effort and cost at the company such as number of person hours; quality measures at X company such as number of defects by severity; information security measures at the company such as number of system vulnerabilities identified, customer satisfaction review scores; earned value; schedule performance index; defect density; peer review coverage; test coverage; and reliability measures at X company such as time to failure.

4.2.1.3. Specify Data Collection and Storage Procedures at X Company

Explicit specification of collection methods helps ensure that the right data are collected properly. Indeed, recognize how measurement data are obtained and stored at X company are achieved through identifying existing sources of data that are generated from current work products, processes, or transactions; identifying measures for which data are needed but are not currently available at X company; specifying how to collect and store the data for each required measure at the company, creating data collection mechanisms and process guidance at X company; supporting automatic collection of the data as appropriate and feasible at X company; prioritizing, reviewing, and updating data collection and storage procedures; and updating measures and measurement objectives as necessary at the company.

4.2.1.4. Specify Analysis Procedures at X Company

Identifying how measurement data are analyzed and communicated at X company are achieved through specifying and prioritizing the analyses to be conducted and the reports to be prepared; selecting appropriate data analysis methods and tools at X company; specifying administrative procedures for analyzing data and communicating results at the company; reviewing and updating the

proposed content and format of specified analyses and reports; updating measures and measurement objectives as necessary; and specifying criteria for evaluating the utility of analysis results and for evaluating the conduct of the measurement and analysis activities.

4.2.2. Provide Measurement Results at X Company

Measurement results based on objective evidence can support to monitor performance, fulfill contractual obligations, make informed management and technical decisions, and assist corrective actions to be taken. Indeed, measurement results that address recognized information needs and objectives are achieved in X company as follows:

4.2.2.1. Obtain Measurement Data at X Company

The data necessary for analysis are obtained and checked for completeness and integrity at X company through obtaining the data for base measures; generating the data for derived measures; and performing the data integrity checks as close to the source of data at as possible such as test and correct for inconsistency of classifications made by human judgment, besides examining the relationships among measures that are used to calculate additional derived measures at the company.

4.2.2.2. Analyze Measurement Data at X Company

This step is accomplished at X company by conducting initial analysis, interpret results, and draw preliminary conclusions; conducting additional measurement and analysis as necessary and prepare results for presentation; reviewing the initial results with relevant stakeholders; and refining criteria for future analyses at the company.

4.2.2.3. Store Data and Results at X Company

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Manage and store measurement data at X company, measurement specifications at the company, and analysis results are achieved through reviewing the data to ensure their completeness, integrity, accuracy, and currency; storing the data according to the storage procedures; making the stored contents available for use only by appropriate groups and staff members; and prevent stored information from being used inappropriately at X company.

4.2.2.4. Communicate Results at X Company

The results of the measurement and analysis process are communicated to relevant stakeholders in a timely manner at X company to support decision making and assist in taking corrective actions through keeping relevant stakeholders informed of measurement results in a timely manner; and assisting relevant stakeholders in understanding the results at X company. Table 1 shows align measurement and analysis activities; and provide measurement results in agile software Enterprise Resource Plan (ERP) at X company.

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Table 1. Measurement Results

ID	Business objectives for ERP system	Information need	Measurement objective for ERP System	Measurement information categories for ERP system	Example base measures for ERP system	Example derived measures for ERP system
1	Customer Relationship Management System (CRM system)	Services can be recovered from sales, marketing, customer contact and call centre support	Customer Relationship Management plans should be executed successfully		Number of services with recovery test failures = 17%	CRM plans confidence rate=83%
	Data Warehouse system (DW system)	Services can be recovered from customers, suppliers, and employees	Data Warehouse plans should be executed successfully	Service continuity	Number of services with recovery test failures= 22%	Data Warehouse plan confidence rate=78%
	Financial System	Services can be recovered from general ledger, cash management, accounts payable, accounts receivable and fixed assets	Financial plans should be executed Successfully		Number of services with recovery test failures= 35%	Financial system plan confidence rate=65%
2	Appropriate capacity to meet Enterprise Resource Plan	Enough resources to meet demand for ERP system	Provide insight into resource utilization, idle resources, and inadequate capacity to meet demand	Capacity	Average service requests per day =25 Available service provider = 14 Programmer and 4 system analyst	Average service time =3 working hours Service provider staff utilization= 10 programmer and 2 system analyst
3	Provide cost effective service	Accurate capacity planning	Unplanned capacity expenses	Capacity	Accurate capacity planning = 93 %	Percentage of service resource costs that are unplanned capacity expenses 7%
4	Improve the level of service quality	The level of service quality	Total number of repeated errors of errors	Service quality	Total number of errors = 28 %	Total number of repeated errors of errors = 62 % The level of service quality = 38 %
5	Provide effective services	Effective service	Percentage of service requests are being reworked	Service performance	Service rework rate = 12%	Effective service = 88%
6	Provide appropriate service	Agreed service availability being provided	The availability of the service	Availability	Agreed service time = 98 % Downtime = 2 %	Availability = 98%
7	Provide reliable service	The service as reliable as agreed	The reliability of the service = 98%	Reliability	Total available time =23.52 hours Total downtime= 48 minutes	Reliability = service available time - downtime 24 hours- 0.48 minutes = 23.52 hours. 98% Reliability

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Based on the above table, it can be shown that CRM plans should be executed successfully because the numbers of services with recovery test failures = 17%, so company X has CRM plans confidence rate of 83%. Data Warehouse plans are to be better implemented as the number of services with recovery test failures is 22%. Thus, the firm has a Data Warehouse plan confidence rate of 78%. Financial System plans should be applied successfully because the number of services with recovery tests failures = 35%, so the company has a plan confidence rate of 65%.

Further, company X has an appropriate capacity to meet ERP because the average service requests per day = 25, available service provider = 14 programmer and 4 system analyst, average service time = 3 working hours and service provider staff utilization= 10 programmer and 2 system analyst. Also, it has an accurate capacity planning to meet ERP cost plan because the accurate capacity planning = 93% and percentage of service resource costs that are unplanned capacity expenses 7%. Moreover, the organization must improve the level of service quality by knowing how many errors are repeated. Further, the total number of errors = 28 % and total number of repeated errors of errors = 62 %, so company X has only 38 % of the level of service quality. In addition, the level of effectiveness of service is 88%, and the level of availability of service is 98%. Also, although percentage of downtime rate is 2% of agreed service time, reliability (i.e. service available time - downtime 24 hours- 0.48 minutes = 23.52 hours) is 98%.

5. Conclusion and Recommendation

CMMI measurements specializing in enhancing productivity and quality, where applying these measurements in agile environment contributing to reinforce client satisfaction through constant repetition and client interaction. One of needs is coming up with, measurement and analysis, to enhance processes, products, and to make sure management system quality is acquired. Conversely, agile software development provides that at designing and adaptation stage, to observe and measure product, where agile is an iterative processes that allows continuous improvement, which is able to facilitate to enhance the quality and standard system and scale back future errors (Stalhane and

Hanssen, 2008).

Based on the case study in X company, it can be said that measurement can be introduced into an agile software development trade in order to improve quality assurance through team work to set up the foundation for X company. This is to grow a useful service provider by institutionalizing selected project and work management, support, and service establishment and delivery processes. Team works define a service strategy, create business plans, and watch and control the work to ensure the service is delivered as planned. The service provider establishes agreements with patrons, develops, management, stakeholders and clients. Also, structure management, procedure, quality assurance processes are institutionalized. Through what was reviewed during this case study, it is clear that quality assurance indicates a positive impact on the software development by the employment of models or standards measurement and controlling processes. This is to say that through implementing CMMI measurements by realizing planned objectives, measuring output compatibility with necessities, meeting client needs and keeping them satisfied in X company, the latter will guarantee a better software development work.

However, a further consideration is needed on how measurement is used in ISO9001, or other quality standards in software engineering. Also, it is necessary to develop specified plans periodically to review software development quality, and quality improvement processes; besides using measurements models or standards to measure quality based on the nature, culture and needs. In addition, the impact of management support within the implementation stage of standards or models that might help assisting successful implementation and therefore quality assurance and performance improvement, should be studied in future research. Also, further research need to apply a cost-benefit analysis for software process improvement, recognizing it as a business investment rather than just a product or process quality entry option. This is as a way to enable more companies of difference sizes to take the adoption leap.

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CONSUMER BEHAVIOR KNOCKED INTENSE BY MOOD, COMMUNICATION AND PRODUCT VALUE

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Abstract

This research study shows how the mood effect the consumer behavior when communication occur both the content and the context affect it. The product value plays an intense roll and shaped the consumer behavior. All these are interrelated for good behavior generation it shows the intensity on the behavior and all the dimensions of the variables cover up each other. The research data was collected from 100 buyers of the products. The questionnaire was distributed among buyers those were buying products in different shops. The results highlighted the importance of behavior during shopping, when the advertisement moving around the store and the media picture rising the both the content and the context which the consumer were looking .it shows at what time the behavior influenced the consumer to act. By the product value enhancement and delivery the consumer behavior waked and act. The behavior of consumers who watch and select brands, product classes, and product attributes how value each of them. In order to explore these relationships it was necessary to define what values are that made up the connection between personal values and consumer behavior. The findings of the study shows that majority of the consumer are infect make their purchase decisions when they are in good mood and the product value played a vital roll in their mood making.

Key words

Consumer mood, Product values, Consumer behavior, Communication

1. Introduction

Individuals normally try to predict each other's moods especially when they are going to make an interaction. Mood information is very helpful in order to facilitate social and professional interactions. Mood is an indicator of one's state it give us the judgment of what the others are now. Let suppose you have the knowledge of the boss's mood on a particular day will help out member of staff to anticipate his reactions to a request for a leave. Same here, knowledge of consumers' mood in marketing s may

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provide marketers with a full understanding of consumers and their reactions to marketing strategies and tactics. The mood knowledge may be mainly appropriate for understanding consumer behavior. The mood states have direct and indirect effects on behavior, evaluation and recall Consumer behavior is also effected by the communication in which the content and the context of the communication matters a lot (Meryl Paula Gardner et al,1996). Values are included in cognitive elements that drive the motivation for behavioral response and they live in the hierarchical structure that global values are related and tied to universal consumption-related values that are connected with product attributes. Which has been normally accepted in consumer behavior re-search? (Donald E. Vinson, Jerome E. Scott, Lawrence M. Lamont, 1977).

Literature Review

(Meryl Paula Gardner et al, 1985) worked over the mood state the positive and the negative mood state how it effects the consumer behavior directly and indirectly second he also discuss about the communication both the content and the context e.g. the advertising the how it effects.

(Meryl P. Gardner and Ronald Paul Hill, 1989) investigated the effects of mood states on the decision-making process by looking in to its effects on inside generated thoughts. Mainly, the effects of mood states on thoughts connected with needs that are higher and lower in Maslow's hierarchy,

(Cheng Qiu and Catherine W. M. Yeung, 2008) found that mood can influence assessment of a product when measured in isolation. But it also, little is known about its influence on comparisons between a numbers of alternatives. They also look-in to how consumer react when it sees the product at first and then how made decisions.

(Donald E. Vinson, Jerome E. Scott, Lawrence M. Lamont, 1977) had argued about the values and the consumer behavior and how the global values effect the consumer behavior and there are also the domain specific values in which the beliefs relevant to economic social, religious and other activates are included and there are the attributes of the product how it effect the consumer behavior.

(Brett Martin and Robert Lawson, 1990) examined the how mood effected by the ads on the televisions commercials and the how it formulate the attitude what were the effective frame of programs that influence more the consumer

(Enneth S. et al, 2005) had looked in to the behaviors of the human especially when they were serving as doctors and nursing department how they behave and how their attitudes work for the patients.

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(M Joseph Sirgy et al, 1989) had looked in to the self-concept in the consumer behavior there were different theories about the self-concept the positive self-congruity and the negative self-Congruity how it affected the consumer behavior and how they were the part of consumer buying personality.

(James A. Roberts , Robert D. Straughan, 1999) had looked over the Green marketing and the effect on the consumer behavior what will be the future of the green marketing Findings point out that in spite of a significant amount of past research attention, demographic criterion were not as helpful as profiling method as psychographic criteria.

(Marios Koufaris, 2002) found that the online consumer as both a shopper and a computer user he tested constructs from information systems (Technology Acceptance Model), marketing (Consumer Behavior), and psychology (Flow and Environmental Psychology) in an integrated theoretical framework of online consumer behavior.

(Robert T. Michael, Gary S. Becker, 1973) founded about the traditional theories about the consumer behavior and about the human, they had thrown the light ton the new insights of the consumer behavior.

(Richard P.Bagozzi and Utpal Dholakia, 1999) Goals plays an important role in the building of the consumer behavior he argued about the motivations of the goals their selection and how they were modified the one purpose was to look in to the emerging of the goals and then how they were converted in to the achievability.

(Paul S.Calem Loretta J Mester, 1994) argued about the new credit card desire how one house hold can acquire the credit card if he was using already one bank card but find it difficult to issue the new one because of the policy of the banks how the behavior of the bank matter in consumer decision.

2. Broad Problem Area

Consumer behavior affect by the mood, communication and the product value.
Previous research studies indicate that mood plays a vital role in consumer Behavior by investigating its effects on internally generated thoughts. Particularly, the effects of mood on thoughts related with needs in Maslow's hierarchy (Meryl P. Gardner, Ronald Paul Hill 199).

3. Objectives of Study:

The objectives of the study are as follows:

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- To analyze the effect of mood, communication (context + content) and product value to shape up consumer behavior and it decision making.
- To identify the major factors of consumer behavior that has not been yet discovered.

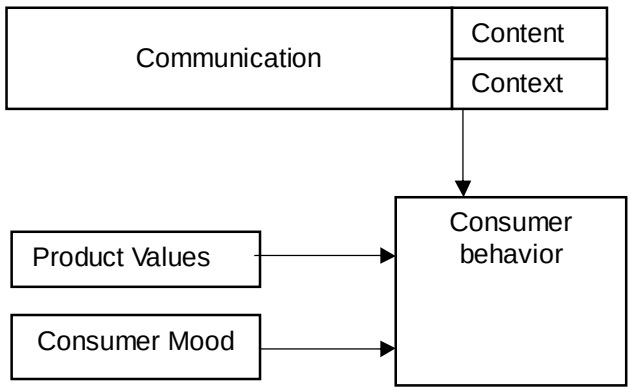
4. Research Methodology

4.1. Sample and data collection

The study sample comprised of 150 consumers who were shopping in the different stores in Islamabad Pakistan which include men and women both. After elimination of incomplete questionnaires, 100 surveys were included in the research. Random sampling technique was used to collect data.

Total Questioners	Men and Women Responded	Age
150 Questions filled out	80 Men 20 Women	Below 25 are 70% Above than 25 are 30%

4.2. Theoretical Model



Model: Consumer Behavior Knocked Intense By Mood, Communication and Product Value

4.3. Variables Description

i. Consumer Behavior

Is the study of when, why, how, and where people do or do not buy a product. It blends elements from psychology, sociology, social anthropology and economics. It attempts to understand the buyer decision making process, both individually and in groups. Different characteristics of individual consumers such as demographics and behavioral variables in an attempt to understand people's want. (Marketing By Richard L. Sandhusen 2011) Consumer Behavior is very important for retailers and it became more diverse because of cultural differences. As consumer incomes differences converge

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across countries (Marieke de Mooija,b, Geert Hofstede 2002).

ii. Mood

Mood normally is thought of as a soft affective position that may pressure cognitive processes like evaluation, memory (Gardner, 1985). Mood is a relatively long lasting emotional state. Mood differ from emotions in that they are less specific, less intense, and less likely to be triggered by a particular stimulus or event. Moods may also affect other psychological variables that have the ability to affect decision-making effort (Ronald Paul Hill and James C. Ward 1989). A mood generally has either a positive or negative valence. Mood effects may also have important implication for making marketing research techniques to judge consumers' attitudes and foresee behavior moreover Mood introduction can be closest to the service encounter, increasing the likelihood that its effects will have an impact on transactions of the consumer (Meryl Paula Gardner 1989).

iii. Communication

Is the activity of conveying meaningful information? It requires a sender, a message, and an intended recipient, although the receiver need not be present or aware of the sender's intent to communicate at the time of communication; (Meryl Paula Gardner 1989).A communication takes place when one individual, a sender, displays, transmits or otherwise directs a set of symbols to another individual, a receiver, with the aim of changing something, either something the receiver is doing (or not doing) or changing his or her world view. This set of symbols is typically described as a message, (William Rice-Johnston, 1987).

iv. Product Value

Values are mainly located in cognitive elements which motivate for behavioral response. They present in an interrelated chain of structure in which global values are related and connected to generalized consumption related values (Donald E. Vinson, Jerome E. Scott, Lawrence M. Lamont 1977).

Customers purchasing products from a profitable activity look for special features such as variety, class, design, and sizes and benefits such as good performance, reliability and durability.

4.4. Hypothesis

H1: Change in mood affects the consumer behavior.

H2: The content of the communication changes the overall consumer cognition and it allow the consumer to act after the knowledge.

H3: The product values have positive relation with the consumer behavior and urge the consumer to act quickly because it attracts the consumer through soft cells.

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5. Data analysis

Reliability Analysis:

Variable name	Cronbach's Alpha	N of Items
Communication	.810	7
Mood	.819	7
Consumer Behavior	.766	6
Product Value	.819	9

Table # 1

Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It shows the consistency between the items and the acceptability such as the variable communication has the Cronbach's alpha value is 0.810 and the number of items are 7 among them the consistency is good and it is acceptable value of Cronbach's alpha. The Mood has Cronbach's alpha value is 0.819 and the number of items are 7 the results shows consistency and the acceptability. Consumer Behavior Cronbach's alpha value is 0.766 whereas the numbers of items are 6 the Cronbach's alpha value shows there is good consistency between the items and the acceptability. The Cronbach's alpha value of Product Value is 0.819 that shows the consistency between the 9 items and acceptability.

Descriptive analysis:

	Mean	Std. Deviation
Consumer Behavior	2.4700	.88140
Communication	2.3600	.81054
Mood	2.3000	.84686
Product Value	2.3500	.88048

Table # 2

Table # 2 gives the mean and standard deviation for the overall sample of 100 Consumers. 5-point likert scale was used for the research. The mean of Consumer Behavior is 2.47 that show the central tendency of variable where as the Standard Deviation which is .88140 that shows how widely the data are dispersed around the mean, Communication is 2.36 which showed the central tendency and the standard Deviation which is 0.81054 that shows the dispersion of the data around the mean, Mood is had the Mean 2.3 and the Standard deviation is 0.84686 and the Product Value has the Mean 2.35 and Standard Deviation. It is observed that the highest deviation is shown by the variable consumer Behavior and the highest level of Standard Deviation.

Correlations analysis:

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		Consumer Behavior	Communication	Mood	Product V
Pearson Correlation	Consumer Behavior	1.000	.496	.540	.658
	Communication	.496	1.000	.606	.643
	Mood	.540	.606	1.000	.738
	Product Value	.658	.643	.738	1.000
Sig.(1-tailed)	Consumer Behavior	.	.000	.000	.000
	Communication	.000	.	.000	.000
	Mood	.000	.000	.	.000
	Product V	.000	.000	.000	.

Table # 3

Table # 3 shows the correlation analysis. The Pearson correlation shows that all variables have a positive relationship. The Correlations section gives the values of the specified correlation tests, in this case, Pearson's r. Each row of the table corresponds to one of the variables. Each column also corresponds to one of the variables. All the above results give the whole picture of the relationship between them.

Model Summary:

Model	R	R Square	Adjusted R Square
1	.667(a)	.445	.428

Table # 4

Table # 4 shows the R SQUARE is .445, which is the explained variance is actually the square of multiple R (.667). R square measures how much of variability in the result is accounted for by the predictor. The adjusted R square in this table gives an idea how well the model generalizes. This model provides information about the regression line's ability to account for the total variation in the dependent variable

ANOVA:

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	34.254	3	11.418	25.697	.000(a)
	Residual	42.656	96	.444		

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Total	76.910	99			

Table # 5

Table # 5 ANOVA summarizes the results of an analysis of variance. The last column shows the goodness of fit of the model. The lower this number, the better is the fit. The table reports the ANOVA results, result is significant. This shows that what predictor we have used and what outcome is predicted.

Coefficients:

Model	Beta	t	Sig.
(Constant)		3.377	.001
Communication	.105	1.021	.310
Mood	.089	.761	.448
Product V	.525	4.341	.000

Table # 6

Table # 6 shows interdependency among variables. Coefficients reveal the magnitude and direction of relationship between dependent variable and independent variables. The cofficiency between Communiation and consumer behavior is 1.021 at significance level of 0.310. The table gives us the t tests results (slope, intercept) Where as in multiple regression we get individual test for each predictor. We need to know that the df for each t is the same as the df for residuals in the F table above. Each t test examines the hypothesis H_0: $\beta = 0$ for the predictor used.

6. Conclusion

On the above results it is accomplished that the hypotheses 1, 2 and hypotheses 3 are accepted. The study shows that communication has a positive relationship with consumer behavior the result also shows the positive relation among all the defined variables. The findings also confirm the fitness of the model in addition; the study gives the evidence provides evidence that by good communication, product value offerings and mood consumer behavior changes.

To maintain a better relation with consumer the producer should look at the product value enhancement at augmented level of the product ,the seller point of view it is very important to keep good communication with the consumer which ultimately effects it mood .the tests had proved the effectiveness of each. Further research needs to be done on consumer behavior and mood.

On the sound basis of the above results it is concluded that the mood and the Product value have great impact on the consumer Behavior and Reliability Statistics results shows that all the items of variables have good relations and the acceptability is high. Model Summary table shows how much of

variability in the result is accounted for by the predictor. The adjusted R square tells that the model generalizes. This model provides information about the regression line's ability to account for the total variation in the dependent variable

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The Survival of an Online Retailer Depends on the Selection of Third Party Logistics Service Provider: Thai Online Case Study

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Abstract: This research explores the results of selecting a third party logistics service provider to carry out deliveries for online retailers in Thailand. A reliable third party logistics service provider have consistently been shown to increase the potential of online retailers, however if the chosen third party logistics service provider cannot perform the give tasks correctly, then it will damage the reputation of the retailers. Online retailers are often inexperienced in performing worldwide delivery, thus the success of their operations lies upon the selected third party logistics service provider.

The finding of this research suggests that the use of third party logistics service providers can affect E-retailers in both positive and negative ways. The finding indicates that reliable third party logistics service providers can enhance international delivery for online retailers. However this research examines only one retailer in Thailand, and thus does not represent all possible scenarios. To draw strict conclusions, the results of this finding will require further research, with more samples and different regions.

Keywords: Third Party, Third Party Logistics Service Provider, Online Retailer, Online Purchasing

Introduction

1.1 Background

The development of technology had not only transformed the traditional supply chain process, but is a major force in shifting the dynamics of the customary marketplace, with 24/7 connections worldwide (Coyle *et al*, 2008). Internet had expanded the borders of traditional marketplace for exchanging goods and services (Lin and Lee, 2009). Internet had created a consumer revolution, enabling consumers to shop virtually from their homes and wait for the purchased items to be delivered right to the door step (Chen and Chang, 2003; Xing *et al*, 2011). Chen and Chang (2003) suggested that two most cited reasons for engaging in online shopping are price and convenience. As a part of customer direct fulfilment, relationships between business and consumer (B2C) electronic commerce focus greatly on marketing and customer acquisition, best achieved by reducing product/service costs and increasing customer's convenience (Coyle *et al*, 2008). Customers are more likely to engage in E-commerce when they feel and perceive that they are getting 'a better deal' (Torkzadeh and Dhillon, 2002). A better deal can invoke more than just cost saving but rather a superior delivery options. The responsibility of traditional 'in-store' fulfilments or shopping has now shifted towards the responsibilities conducted by retailers as a part of their fulfilment process. This binds the retailer to an efficient, effective management of their distribution system and its fulfilment process of delivering goods to customer's home. Since online retailers do not implicate physical distribution of goods to customers, they must rely on the service of a third party logistics service provider (3PL) to complete its functions.

There are two types of online retailers, multi-channel and pure players. Both require different logistical tasks (Xing and Grant, 2006). A 'Multi-channel' retailer is an every store that also provides an online service options, resulting from an overwhelming majority of purely Internet base retailers. Resulting from a rapid growth of Internet and E-commerce, many traditional retailers have developed an online branch as well as the traditional in store sales

(i.e. Wal-Mart, Ikea, Tommy Hilfiger and even supermarkets such as Coles and Woolworths). Likewise, Companies or stores that have no physical front or traditional brick-and-mortar retail settings are known as a 'pure player retailers', and thus rely solely on the Internet to conduct business i.e. Amazon and Dell (Xing *et al,* 2011). It is crucial for online businesses to implement an effective last miles delivery, especially for pure player. Usually pure player such as Amazon offers a standardised packaging, books, gifts, CDs and electronic equipment. These small orders can be delivered in parcels or packages to allow for the convenience of the delivery and the ultimate customers (Xing *et al,* 2011). Due to the nature of these deliveries, home deliveries are usually carried out in smaller batches. Therefore both pure players and multi-channel retailers may find it difficult to efficiently distribute them worldwide (Rowlands, 2001). With this, Internet retailers placed their reputations and trusts with an external third party to carry out their physical distributions. Poor handling of goods from the selected 3PL may cost them their customer's satisfaction (Zeithaml *et al,* 2002). For example, if an eBay seller have low rating, buyers are less likely to purchase from that particular seller. Since customers cannot see nor touch the actual goods they ordered, it is important for online firms to create a good value proposition such as convenience, timeliness and good condition upon each delivery.

1.2 Online retailer

The case study presented in this research has been chosen to analyse and explore the reasons underlying a Thai online retailer's decision to outsource. The extent of this research will also examine the relationship between online retailers and their logistics service providers.

This particular Thai E-vendor offers a variety of Thai Boxing equipment and products online to many individuals and retailers around the world. Potential buyers are individuals who are interested in Thai boxing at home, fighting gyms or Muay Thai (Thai boxing) gyms around the world. As a pure player retailer, this online firm performs their own production, design, warehousing and quality control, while outsourcing a few minor products and deliveries to selected partners. Thai online retailer had employed third party logistics service providers such as DHL, UPS and Thailand post to take care of their deliveries. These logistics specialists were selected in compliance with the retailer's current requirement and future objectives.

1.3 Identification of problems and objectives

Unlike traditional stores, online businesses revolve around impulse purchases from customers. With one click price comparison among several online retailers, the retailer will incur either a fast gain or loss of customers (Chen and Chang, 2003). It can be said that among online realms, a customer's loyalty plays a lesser role than that of traditional store. As noted earlier, the Internet has allowed sellers to offers a limitless range of goods. However sellers may experience a lost sale if they failed to match their customer's demands with the existing inventory (Rabinoviah and Knemeyer, 2006). The consequences of a missed opportunity will invoke a high opportunity costs. An inefficient online retailer may result from a slow address of insufficiencies in their operations and may face customer desertion. Customer desertion may results from wrong orders, slow/late orders or even not receiving them at all (Rabinovich and Knemeyer, 2006). Due to the nature of the purchase, customers cannot see nor touch online goods, therefore it is the physical distribution service quality provided by 3PL on behalf of online retailers (both multi-channel and pure player) to deliver goods at the "*right place, at the right time, in the right quantity and in the right condition*" (Xing *et al*, 2011, p. 335). If these conditions are not met by the representatives of the online retailer, customers may suppress good history and hold online firms responsible for any incompetency.

The problem arises from a limited understanding and awareness of the significant roles given to 3PL. Most Internet sellers will either decide to avoid or engage in a low-priced 3PL. Mentioned by Rabinovich and Knemeyer (2006), although employing cheap service providers may seem like a winning course of action, it might as well be a 'winning curse'.

Upon being chosen for their cut-rate services, these service providers may attempt to increase their own profit at the expense of the online retailer. Furthermore these service providers may consistently increase fees or cut corners in their operations to reduce their own delivery costs. Thus, as noted earlier, Zeithaml *et al,* (2002) also agrees that poorly performed 3PL can damage online firms reputations and brand names. For instance, sellers on eBay heavily rely on positive feedbacks and rating percentages to gain trusts and acquire new customers. Without such buyers are more likely to purchase from other sellers.

It can be said that delivery is the heart of online retailing. Hence it is important for online retailers to have a basic knowledge before employing 3PL. How should online retailers select their representatives? What are the key benefits and drawbacks of employing 3PL? Will these specialised bodies understand the importance of this relationship between online vendors and their customers? These issues reflect logistical concerns for online vendors, panting the right perspectives and mindsets. Retailers should measure both pros and cons appropriately before employing 3PL (Xing *et al,* 2011). Therefore, understanding the economies of these functions will allow Internet sellers to seize the opportunities created by 3PL and lower the fulfilment costs by increasing their internal operation efficiency and reducing errors.

This research aims to examine the roles of 3PL in maximising the potential of online retailers in Thailand. There are little studies conducted towards logistics problems in Thailand in general, particularly the relationship between 3PL and E-business sector. The main aim is to emphasise a better understanding of 3PL, their roles as representatives for online retailers and the advantages and the disadvantages of these service providers, including the expectations of the end consumers. This research generates interests because it identifies and explores the system of 3PL in Thailand. Thailand is currently classified as a developing country which strives towards competing internationally. As mentioned above, in an online world, developing countries can be more active and participate in the global economy (Coyle *et al,* 2008). Therefore, for Thai online vendor to survive, they must concentrate on their core business operations while letting other specialised bodies (3PL) complete their deliveries.

Literature review

A broad definition of a third party logistics (3PLs) is an external firms or suppliers that carryout all or parts of other firms logistics functions, also known as contract logistics (Coyle *et al,* 2008; Kersten and Koch, 2010). As mentioned earlier, 3PL have long since offered only transportation or warehousing. Conversely, the modern logistics service industry has shifted to a more dynamic multifunctional outsourcing (Coyle *et al,* 2008; Bowersox *et al,* 2010; Kersten and Koch, 2010). These suppliers may provide financial, transportation and warehouse services (coyle *et al,* 2008).

Additional characteristics of modern day 3PLs includes multiple logistical activities which are integrated to provide the best solutions to logistics/supply chain problems (Coyle *et al,* 2008). Integrated service provider (ISP) offers an extensive range of services, including tasks essential to accommodate customers; for example, delivering products and order entries. Hence it is commonly known throughout the industry that ISP represents third party (assets based) and fourth party (non-assets based) logistics service providers (Bowersox *et al,* 2010). In addition, firms that own and operate assets such as distribution building, transportation equipment and other specialised technologies are classified as asset based firms. In contrast, firms that specialised in arranging a comprehensive solutions and information services to facilitate efficient flow performance of another organisation supply chain are known as a non-assets based.

There are three common factors that motivate outsourcing. These motivational forces consist of costs, strategies and politics (Kremic *et al,* 2006). Although these three reasons are common, they do not represent all the possible motivational factors and is it unlikely that firms may retain only one element.

By contracting out operations such as delivery and warehousing, firms can reduce unnecessary capital investments (Xing *et al,* 2011). It is more economically viable for firms to contract out certain unnecessary in-house operations. Through specialised skills, technologies and experiences, 3PL can

provide a superior solution and reach the economy of scales (Kersten and Koch, 2010). Additionally, by hiring 3PL providers, online retailers can significantly avoid certain fixed costs associated with the handling of facilities, transportations and human resources allowing firms to focus on improving their internal operations (Enders and Jelassi, 2000; Anderson et *al*, 2003). Therefore through a compilation of experiences and skills, 3PL are able to perform services cheaper than a company would (Kersten and Koch, 2010).

The outsourcing trend had shifted from purely cost saving to strategic reasons such as to increase internal flexibility and to focus on core competency (Roberts, 2001; Kremic *et al*, 2006). 3PL firms are considered specialists who offer their capabilities, knowledge, experiences and skills for another firm's supply chain (Núñez-Carballosa and Guitart-Tarrés, 2011). 3PL can apply their specialisations and skills in another firm's operations. For example, tasks that are always thought of as a core business maybe better off to outsource to a 3PL.

Kremic *et al*, (2006) suggested that public and private organisations may exhibit different reasons to engage in outsourcing. Similar to that of everyday business, public and private organisations does not always hold the same interests. The performance of public organisations may not aim to satisfy the market demands nor profitability, unlike private organisations (Avery, 2000). Avery (2000) further suggested that factors which may have impact upon public firm's decisions to outsource, might arises from the elected delegates, government programs, public opinions or following international/domestic trends. Since public organisations are often held in lower esteem than private organisations, elected candidates may try to introduce outsourcing, usually during the election period to obtain votes and appeal to the notion of a positive changes (Kremic *et al,* 2006). Thus, outsourcing decisions for public firms may come from the existing legislations, and therefore cannot but comply with the law. However outsourcing does not always bring positive changes.

Although in theory there are many benefits of using 3PL in both traditional and online business settings, failure to accomplish outsourcing efficiency and properly manage risks may provide a negative results. Losses emerging from outsourcing could outweigh the expected benefits (Ngwenyama and Sullivan, 2007; Kam *et al,* 2011). The more integrated firms are the more difficult it is to monitor and maintain. Relocating several functions across the organisation and adding new sections to certain margins may complicate the process (Kremic *et al,* 2006).

Firms may engaging in an outsourcing activities in order to save costs, however there are no guarantees that they will be able to do so; even worse, it may create the opposite effect. Without realising, firms may invoke indirect or unexpected costs (Kakabadse and Kakabadse, 2000). 3PL can generate new expenses for retailers, Rabinovich and Bailey (2004) suggested that costs may arise from controlling and monitoring the performances of 3PL towards the end consumers. For example, further costs may arise from monitoring outsourced functions such as tracking deliveries during the last miles process and costs of collecting feedbacks.

It is hard to outsource tasks that experience an extreme amount of uncertainties, especially in the long run. In such case, 3PL may find it difficult to charge their customers. Generally in such cases 3PL may charge a higher rate than usual to cover any extra risks (Kremic *et al,* 2006).

Though firms may outsource for strategic purposes such as allowing them to focus on their core competency and increase their level of flexibility, there are potential downsides that firms should be aware of. Suggested by Kremic *et al,* (2006), companies may overly rely on 3PL to carryout tasks and this may extend to inappropriate tasks, which companies should

perform internally. Outsourcing can lower productivity internally and decrease worker morale, which significantly relates to absenteeism. Research from Rahman (2011) indicates that Australian firms that engaged in this transition, saw up to 50% of its employees morale been affected negatively. Additionally, as far as social costs are concerned, contractors may be less willing to educate and cultivate specific skills to their own workers, thus eroding away internal skills (Lafferty's and Roan's, 2000).

Methodology

The area of 3PL utilisation among E-retailers is still regarded as an understudied area. Therefore to gain an insight into this area, an exploratory approach was taken for this research. In order to explore the benefits of 3PL among E-retailers, a case study technique will be employed, in reference to the topic. Suggested by Creswell (2007), a case study is a research study that involves exploring issues through one or more cases; this also known as a study within a bounded system, by setting a context. One online retailer in Thailand will be selected for this research. As such, the retailer has to be located in Thailand and offer online trading options (Multi-channel or Pure player). Above all, the selected retailer must employ one or more 3PL to perform parts or all of their functions.

Among the process of qualitative interviewing, in-depth interviewing data collection in a case study is regarded as one of the most commonly used methods, as a key to exploring social sciences. As mentioned above, one successful online retailer in Thailand who exports their goods both domestically and internationally were chosen as a case study to be interviewed in-depth. Unlike normal survey interviews, in-depth interviewed are far more unstructured allowing small numbers of participants to share their experiences. This research aims to explore the experiences of an online retailer and therefore questionnaires were designed to be flexible enough to allow exploration of E-retailer's knowledge. Unstructured interview aimed to explore the entire topic from the perspectives of the participants while allowing flexibility (Walter 2006). Open-ended questions were design to explore the topic, by focusing on questions opener as 'what' and 'how' the use of 3PL has affected their operations. The flexible nature of the interview questions will help uncover a wide range of information to be examined and explored.

A detailed transcript of the interview were drafted and analysed for any recurrent themes/issues. To do so, this research adopted a method known as 'Content Analysis'. Content analysis is merely another option to expose any hidden symbolic messages from a communicative content (Royce *et al*, 2005; Walter, 2006). Simply, content analysis is the process where contents of the obtained data are reduced to reveal any distinguished themes or categories of the data (Royce *et al*, 2005). By unveiling the psychological state of a person or group, content analysis aims to describe and expose themes or patterns of responses into each category and distinguish any potential propaganda. This research had adopted this methodology to help explore the topic of 3PL usage among online retailers in Thailand. Since there are a handful of studies conducted in such areas, particularly in developing countries, this research aims to depict/portray any hidden themes amongst the obtained data. The extracted data will firstly be broken down into an explicit coding to reduce unnecessary words and expose any significant patterns or themes. Explicit coding systems operate based on labelling easily identified themes or content of the manuscript (Walter, 2006). Important quotes and information are coded based on the categories as follow:

1: Outsourcing motivation
2: Impact and usage of 3PL to online retailer
3: Relationship and contribution between 3PL and online retailer
4: Quality consideration
5: Problems and improvements

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The interview was broken into each subsection of the thematic coding. By dividing the manuscript contents into the above categories, the chosen method will be used to eliminate unnecessary substances, leaving only the importance data to be collected and analysed.

Analysis and Discussion

4.1 Outsourcing Motivation

Confirmed in this case study, the participated Thai online retailer commented that 3PL played a major role in their business operations, distributing Muay Thai boxing equipment worldwide. They also highlighted that 3PL are the key to online retailing. Without the assistance of 3PL, online retailers such as themselves would not have reached their goal.

"Without 3PL collaboration, an online retailer can do almost no business"

It was also noted in the interview that 3PL had allowed them to sell and distribute Muay Thai sporting products effectively. One of the most obvious factors for outsourcing among online retailers is the lack of knowledge and skills. Not many E-vendors have acquired the expertise of delivering goods worldwide. With specialised tools/technologies and attributes, 3PL are a better option for performing logistical tasks. 3PL should already have all the necessary resources, such as warehouses, transportation and expertise to help them deliver goods worldwide. In this case studt, the Thai online retailer also commented that his company does not have sufficient resources and knowledge to distributie their products at an international level, thus it is essential for them to employ 3PL to perform such tasks:

"One reason for utilizing 3PL is the fact that our company does not have the experiences, skill or specialisation at delivering goods"

"…DHL has all relevant technologies to support throughout our business supply chain."

The interviewee suggested that by relocating their available resources towards the core functions, they can strengthen their business and remain competitive within the industry. Furthermore, the available resources allow the Thai retailer to generate operational flexibilities internally as well as allowing them to respond to the increasing demands of Muay Thai boxing equipment. This aligns with the study by Kremic *et al,* (2006), which pointed out that outsourcing helps retain the level of competitiveness retailers need.

"Another reason for using 3PL is to allow our company to focus on our main business, while the external party takes care of our delivering. Moreover, 3PL provides us with flexibility in our business, help cost saving and importantly 3PL allow us to tap into their network which help strengthen our relationship and online business."

"We declared that 3PL is the essential part our business. 3PL had enabled us to focus on our own core processes so that supply management has been improved and delivery tasks have been successfully carried out."

As confirmed by the interviewee, collaboration with 3PL allows the Thai online retailer to gain access to an extensive network within the world of 3PL itself. For instance, the Thai online retailer may gain access to the 3PL's partners, customers and suppliers which may help online retailers strengthen their delivery choices.

The finding suggested that not all retailers have the experiences and skills to carry out international deliveries. As suggested by the Thai online retailer case study, without the delivery skills and knowledge, they cannot comply with the international demands for Thai boxing equipment, hence 3PL were employed to assists them. By outsourcing tasks they are not familiar with, the online retailer can focus on other important tasks. Moreover, 3PL not only help transporting goods internationally, but also providing the online retailer with access to the extensive network of 3PL which will also benefits them.

4.2 Impact and Usage of 3PL to online retailer

It is common among retailers to contract out several 3PL at once. As confirmed by the case study, the majority of online firms do not carry out their own deliveries; therefore it is essential to ensure the best outcome of any circumstances that may arises. In such case, more than one service provider may

be needed. Likewise, firms can outsource different functions to each service provider. As mentioned by Juga, Juntunen and Grant (2010) and Rahman (2011) firms may find it more convenient to employ several 3PL to assists in different logistical tasks such as manufacturing, information technology, financial and human resource management. In line with the previous studies, the findings from this case study indicate a similar approach. The retailer employed different 3PL for domestic and international deliveries of Muay Thai equipment.

> *"We do not carry out our own delivery. The distribution system currently in use is Third Party Service Provider (DHL global, DHL express and UPS express) for global and Thailand Post (EMS) and surface mails for domestic customers"*
>
> *"For domestic market, we use Thailand Post as a 3PL as well as postage which is also a service of Thailand Post. DHL and UPS are used for international unless there is a domestic request. Yes, Thailand post is used regularly for domestic deliveries unless DHL or UPS is requested by a customer"*

Internet has redefined the boundaries of everyday shopping. Customers can now purchase goods from anywhere around the world and expect it to be delivered to them. In accordance with the past studies, the Thai online retailer also made a claim that an under-performing 3PL can potentially reduce the delivery reliability. In addition, the interviewee suggested that Muay Thai is becoming popular worldwide, hence the increasing demands. Since they do not have sufficient resources to perform the delivery function themselves, they must ensure that the contracted 3PL vendors are able to assist them in the needed area. They viewed incompetent 3PL as a confinement towards company's options.

> *"In the past, our company had problems for international delivery using Thailand Post and we could not do the delivery either. Therefore, employing professional 3PL made business possible."*
>
> *"Thailand Post is used for only inside Thailand as it has advantages in domestic terms but inferiority of international services."*

Interviewee had pointed out that by employing a reliable 3PL, they can maximise online retailer's potential. In addition, it was mentioned by the Thai online retailer that if 3PL performs the given tasks properly, the customer will be satisfied with their company. This will allow them to sell more Muay Thai boxing equipment globally. On the other hand, if deliveries were conducted poorly then it will create a detrimental effect. For instance, customer dissatisfactions, complaints can induce loss sales and ultimately a reduction in the company's profitability. As suggested earlier, similar to that of eBay rating criteria. If sellers were to have a low or unreliable rating, buyers are more likely to purchase from other sellers instead. Moreover, high rating among sellers can be used as a sell point, attracting new customers, showing a reliable image.

> *"If 3PL perform well then the customers will be satisfy and we can sell more goods, but if there is a problem then it will create dissatisfactions among customers and will drive customers away from our company, our products and they might even tell their friends and family about their experiences which all are negative to us."*
>
> *"Today, our company can monitor the supply chain management to standard level with almost no supply complaints. And as using the 3PL, the delivery problems have been decreased to almost none."*

Shown through the case study, online firms may aim beyond costs saving, but rather to strengthen their overall business. In order to strengthen their business, online firms may decide to integrate with selected 3PL. By utilizing each other's resources both firms will achieve a mutual benefits or a win-win scenario. This can invoke the best results for customers around the world, as delivering system will be sufficient to satisfy worldwide demands.

In conclusion, 3PL can extend the margins in which online retailers can operate. This can further generate potentials for retailers. However, poorly performed 3PL can create a negative effect. For instance when goods are not delivered on time, customers may not want to purchase from the same retailer again. As a result, a company's reputation may be lowered among customers. As suggested by

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the interviewee, customers may also prevent their friends and family from purchasing from their company.

4.3 Relationship and contribution between 3PL and online retailer

The interviewee agreed that 3PL had helped them to capture opportunities generated by the World Wide Web. As mentioned by the interviewee, as customer demands for Muay Thai grows, so does the importance of 3PL. According to the interviewed retailer, it is difficult and not worthwhile to conduct an online business without a suitable delivering system. In accordance to studies conducted by Xing *et al*, (2011) and Rabionvich and Knemeyer (2006), in order to keep up with the market demands globally, the Thai online retailer needs to leverage on their relationship with 3PL to assists them in fulfilling customer's demands worldwide. Hence, just like selecting any partners in business, firms should select appropriate 3PL to assist them in their journey. Noted by the interviewee, without a reliable service by 3PL, it is not worth the time and effort to conduct an online business. Furthermore they may have to open a traditional store, for better or worse.

> *"Without a reliable delivering system online store cannot/very hard to sell their goods globally and we probably have to end up opening a store, which face high capital, fix costs etc, this is why not many people are not successful, or can't do it."*
>
> *"Without a reliable service provider or delivering system, all online business cannot be accomplish, simply cannot be done, there is little profits and not worth the time."*

As noted earlier, firms will also attain further resources that 3PL can provide, which will enhance customer convenience. For instance, besides 3PL own expertise, online retailers can gain access to 3PL's network of relationships i.e. suppliers, customers and other additional carriers to enhance their services. In the case of the Thai online retailer, DHL, associated with UPS, has divided tasks amongst themselves to provide the best solutions for the retailer. An example from the case study shows that DHL may perform international shipment where they can deliver to UPS to deliver goods domestically

> *"3PL allow us to tap into their network which helps strengthen our relationship and online business."*
>
> *"...importantly 3PL allow us to tap into their network which helps strengthen our relationship and online business."*
>
> *"Partners are playing their roles differently together along the supply chain. Each is one of our strategic partners while the relation among themselves is a mission based relationship or a tactical."*

Not all firms are willing to compete on price and cost reduction, but a long term relationship with their 3PL (Roberts, 2001; Kremic *et al*, 2006). In line with the study by Núñez-Carballosa and Guitart-Tarrés (2011), retailers may decide to overlook costs reduction, as they may seek long-term strategic integration. As stated by the interviewee, their company focuses on future plans and therefore 3PL were selected according to their future objectives.

> *"3PL are selected in compliance with company's plans, future objectives, product lines, expansion, acquisitions etc."*

As the business grows, retailers often seek to improve their delivering system3PL that offer the best terms and conditions to retailer's requirements are often selected. For example, as mentioned by the Thai online retailer, as they aim to improve their delivery, they negotiated the best terms and condition to place their customers as first priority. Hence selecting 3PL that can match online retailer's conditions and requirements can increase online business physical distribution. As suggested by the interviewed online retailer:

> *"DHL and UPS were selected as the partners for international delivery based on the level of provided services, terms and conditions that suitable for the company's requirements i.e. delivery fee structure which is suitable for the weight of the product to be delivered, pick up frequency that match with the company's requirements."*

To achieve timely deliveries, the Thai online retailer negotiated for pickup twice a day. This will reduce the time goods remain in the warehouse and the time it takes to reach its destinations.

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"DHL as an integrated provider has advantages of giving negotiable discounts and providing exclusive services such as priority to service and twice a day package pick up while our company contributes payment in return."

The contribution of partners are known and recognised as they contribute to the success of the online business and in return 3PL can also gain from the relationship. For instance, the interviewed company suggested that, if they were to be successful when outsourced parts of their functions, other emerging firms or existing firms may consider employing 3PL. This will drive businesses to seek out 3PL assistance, thus beneficial for 3PL.

"After the existence and performances of these partners have been known and recognised among each other they contribute toward the success of our business of which they also gain in win-win mutual benefits"

"The success of our online business will increase DHL's income by encouraging other businesses to conduct online options and employ DHL"

Shown through the case of Thai online retailer, online firms may aim beyond costs saving, but rather to strengthen their overall business. In order to strengthen their business, online firms may decide to integrate with selected 3PL. By utilizing each other's resources both firms will achieve a mutual benefits or a win-win scenario. This can invoke the best results for customers around the world, for delivering system will be sufficient to satisfy worldwide demands.

4.4 Quality consideration

As revealed by Thai online retailer, the Internet has allowed them to offer a wider range of goods; therefore, deliveries must be carried out properly worldwide. Consumers can buy similar products from another online store or in an actual store. According to Coyle *et al*, (2008), customers who buy goods online seek convenience. They choose to buy online and pay the delivery costs. Hence convenience is the key to stay competitive within the industry and acquire customers. For example, some consumers prefer selected goods to be delivered directly at their house instead of searching for a particular item at a store. The Thai online retailer reported that:

"The company, as a pure player, offers a variety of Thai boxing products online to mainly individuals and a few retailers over countries around the globe and domestic market in Thailand."

"Currently the demands of our products are worldwide with potential buyers are Muay Thai practitioners around the world and individuals that are interested in Thai boxing. This includes Thai boxing gym around the globe. Therefore the nature of our market will be individuals and gyms that seek the convenience of home delivery."

The interviewee mentioned that it is the very heart of the company to ensure that their Muay Thai combat gear ordered online reaches its destination. Delivering products to customer's home is basically online business for them. As it is an important procedure, delivery are outsourced to a more specialise body.

"We hold high regards to home delivery; we believe that it is vital that goods reaches its destination."

As noted earlier, online retailers consider delivery the heart of online business. Electronic service quality is an important driver which determines the successful of E-vendor (Zeithaml *et al*, 2002). Agreeing with this idea, the Thai online retailer stated that since service quality is essential to their business they couldn't afford to make any mistakes. To ensure the highest order fulfilment quality and customer's satisfaction, specialists (3PL) may be needed to fulfil customer's orders. The interviewee stated that:

"Quality is always important; it does affect the business if there is a problem"

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> *"Timeliness and quality will help reassure and strengthen customer's satisfaction level and hopefully want to continue to buy from us, even letting out words to their friends. Besides, this could also generate demands for our other products when we launch a new products etc"*

In accordance with past studies, online retailer suggested that it is better to outsource such tasks to a more skilful and experiences body, 3PL. It is too risky to perform such tasks in-house or to an under-perform 3PL. The consequences of poor delivering performance may create a negative mentality for customers. For instance, one bad delivery may change new customer's perspective on online shopping. Therefore, the interviewed online retailer also agreed with past studies and suggested that:

> *"As the customer's expectations to receive the goods in the right conditions, timeliness and at the agreed prices, it is the skills/expertise and reliable service standard level of 3PL that can meet those customer's expectations"*

The involvement of 3PL specialists such as DHL and UPS had helped improve the service quality among E-retailers. Online firms do consider the level of physical distribution service quality as timeliness, accurate orders, viability and product returns to be significant. However to reach a compatible stage domestically and internationally, retailers must acquire the skills and specialisation of a 3PL.

4.5 Problems and improvements

By outsourcing certain tasks, online retailers have to rely upon the 3PL to perform the given tasks properly. Therefore, firms must closely monitor the performance of 3PL to ensure that given tasks are carried out in a proper manners. For example as noted earlier on, firms should monitor the outsourced functions such as tracking deliveries during the last miles process, collecting feedbacks to make sure that the goods reach their destinations in a proper manners. Correlates to the previous studies, the Thai online retailer stated that since they have to rely on 3PL to perform important operations, they must collect feedbacks from customers to ensure that the deliveries are carried out properly, as well as any additional problems.

> *"Another dimension is that we have to rely the whole business on 3PL, leaving our important parts to them."*
>
> *"We monitor the delivery quality of 3PL thru customer's complaints, each of the customer complaint have been verified and investigated to the root cause, the containment actions have been carried out to overcome the problems and the summary of the complaints have been reviewed for the corrective actions and preventive actions."*

Advised by Rabinovich and Bailey (2004) it is important for online retailers to have control over outsourcing activities. Relationships between online retailers and 3PL can often be rough and firms may face unexpected delays and lack of performance (Xing *et al,* 2011). Upon entering a contract with a 3PL, firms cannot expect to gain benefits. Often low cost 3PL may results in the opposite effect; as noted earlier on by Rabinovich and Knemeyer (2006), low costing 3PL may attempt to exploit retailers for their own profitability. Such 3PLsmay cut corners when performing the given tasks, poor performance rate and continue to increase fees. These corrupted behaviours will end up damaging the online firms rather than aiding (Zeithaml *et al,* 2002). As pointed out by the Thai online retailer, when they rely solely on Thailand Post to deliver goods both domestically and internationally, the goods didn't reach their destinations on time. Hence they were receiving many complaints and negative feedbacks during their time. For example, in the past, people who ordered Muay Thai combat equipment could not receive their goods in time for a competition, therefore people were dissatisfy with their service.

> *"If 3PL perform well then the customers will be satisfy and we can sell more goods, but if there is a problem then it will create dissatisfactions among customers and will drive customers away from our company, our products and they might even tell their friends and family about their experiences which all are negative to us."*

> *"In the earlier years, we faced with problems dealing with two main aspects; from our own supply management and from the 3PL like Thailand Post such as long internal documentation process, long queuing to process at the 3PL service counter for each item to be delivered, inflexibility of the delivery cost structure and the timeline of the product delivery as committed."*
>
> *"In the past, our company had problems for international delivery using Thailand Post and we could not do the delivery either. Therefore, employing professional 3PL made business possible."*

The successfulness of both firms depend on one another, hence the relationship between 3PL and online retailers is said to be significant. However, The Thai online retailer claims that cooperation level are usually determined by the amount of money spent on 3PL, a company tends to receive a better services when they contribute more funds to the 3PL.

> *"Although the cooperation level usually depends on individual customers (each different vendors), depends on who is the highest bidder, who use their services more (pay more) will get better cooperation."*

As the Internet has allowed sellers to offer varieties of goods, sellers may also experience a lost sale if they fail to match customer's demands with the existing inventory (Rabinoviah and Knemeyer, 2006). The consequences of receiving wrong, late or even not receiving their orders at all, may prevent customers returning. The majority of online businesses nowadays do have return policy options included, to enhance their service quality and to ensure the customer's satisfaction.

> *"Our company do have return policy if the product delivered is the wrong size, not fit or damaged. We also have the claim or reimbursement policy: if a good does not reach the destination or get damaged either by delivery process or by custom check.*

Problems can also occur during the transportation stage, along the delivery line. Problems regarding custom duties and taxes are among the least explored topics. Customs varies from country to country. There are a few problems that may arise from customs. For example, same items or similar weight items may be tax differently each time, depending on customs. Other times, goods may just slip through the customs processes altogether and doesn't cost the consumers at all. This inconsistency can cause irritation and confusion among customers of the online retailer. The interviewee claims that goods can get charged differently, even though it is an identical item, a similar one or the same weight. Moreover, the Thai online retailer further stated that goods can get damaged during the customs process. For example, the quarantine and customs process may require officers to cut open each parcel. Not knowing what is inside, the process can sometimes damage the equipment, such as boxing gloves and pants. Those items cannot be use once it is damaged, thus it would then be return to the retailer to be replaced. This area is still considered a problem, which may delay, goods before reaching customers. As a specialist who knows rules and regulations of all countries, 3PL should provide a clear standard price for goods to customers and other information. By doing so, 3PL can prepare customers for what is unknown and paint the right mindset. As suggested by Thai online retailer:

> *"In terms of Custom Duties / Taxes which may vary from orders even though they are the same good / same product type, the 3PL which considered as the expert to deliver products internationally and have to work with customs in every country, therefore they should have a clear standard for Custom Duty/tax fees for goods/products so customer can bear in mind the possible additional cost."*

In conclusion, to ensure the best outcome of services from 3PL, online retailers must closely monitor and control the performance of the 3PL, which can be costly. Problems occur at any stage, not only delivery. Therefore it is wise to implement a return policy among online retailers, to ensure the satisfaction among customers. Problems can also arise from another nation's customs, which can delay and damage goods. Therefore it was noted that 3PLs should inform customers on additional fees/delays, so customers can take that into account and be prepared.

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Conclusion

The finding of this qualitative case study on the Thai online retailers has suggested a positive relation between 3PL and the survival of online retailers. The relationship between these two parties had shown to increase opportunities for both firms. Not all firms are considered an expert in the field of logistics, in fact the majority of online firms are quite the opposite. Thus, these firms may seek specialists to assists them in these areas. With the skills and knowledge of 3PL, online firms may be able to save costs and gain flexibility among their resources and operations. In addition, while firm outsource their weakest area, they can concentrate on their core business, to enhance their value and remain competitive. However a poor performance from these hired 3PL, firms may endure more harms than good towards their own business.

It was shown through the Thai online retailer case study the essential aspects of selecting appropriate the 3PL, for the performance of 3PL can directly boost the retailer's success rate or invoke the opposite effect. Therefore retailers should have a clear understanding of their service providers and what they can provide to help assists them in satisfying their customer. Retailers should have a clear idea when selecting 3PL to perform their tasks. For this relationship to be successful, both firms must work closely together. At the same time, online firms should also continue to collect their customer's opinion and feedbacks. To ensure a high service quality and performance of tasks outsourced to 3PL, to continuously seek improvements and to guarantee their own survival.

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"Service Quality in Higher Education: A Concept Paper"

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ABSTRACT

This concept paper argues that "service quality" is a highly debated notion and has varied meanings for people from different background especially for people from higher education sector. Thus, this paper has investigated various models of service quality in higher education, report its shortcomings and contributions to the assessment of higher education institutions. While there is a consensus on the importance of service quality issues in higher education, the identification and classification of the service quality attributes is a challenge to gain a better understanding of the quality issues of students' experience.

Keywords: Service quality, higher education, models of measuring quality.

1.0 Definition of Service Quality

Parasuraman et. al (1985) defined service quality as "the global evaluation or attitude of overall excellence of services". So, service quality is the difference between customers' expectation and perceptions of service delivered by service firms. Nitecki et. al (2000) defined service quality in terms of "meeting or exceeding customer expectations, or as the difference between customer perceptions and expectations of service". Service quality is a focused evaluation that reflects the customer's perception of specific dimensions of service: reliability, responsiveness, assurance, empathy, and tangibles. Satisfaction, on other hand, is more inclusive: it is influenced by perceptions of service quality, product quality, and price as well as situational factors and personal factors. The role of service quality in higher education has received increasing attention in the past 2 decades and higher education institutions are ensuring that all services rendered to students' are managed well to enhance consumer perceived quality.

A definition of quality revolves around the idea that quality has to be judged on the assessment of the user or consumer of the service. The construct of quality as conceptualized in the services literature is based on the perceived quality. Perceived quality is defined as the consumer's judgment about an entity's overall experience or superiority (Ziethaml, 1987; Zammuto et. al, 1996). Therefore, perceived service quality could be the product of the evaluations of a number of service encounters and in this case, of a student, these could range from encounters with office staff, to encounters with tutors, lecturers, the head of departments, etc (Hill, 1995). As a result, if an organization regularly provides service at a level that exceeds customer expectations, the service will be evaluated as high quality. In contrast, if an organization fails to meet customer expectations, the service will be judged as poor quality (Zammuto et. al, 1996). According to Dyson et. al, (1996) the service quality is so called the better and standardized output delivered by a service. The service quality in the educational sector particularly in the higher educational institutions is the fundamental aspect of educational excellence.

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Service quality has become an important research topic in view of its significant relationship to costs (Crosby, 1979), profitability (Buzzell and Gale, 1987; Rust and Zahorik, 1993; Zahorik and Rust, 1992), customer satisfaction (Bolton and Drew 1991; Boulding *et al*, 1993), customer retention (Reichheld and Sasser, 1990), and service guarantee (Kandampully and Butler, 2001). Service quality has also become recognised as a driver of corporate marketing and financial performance (Buttle, 1996). Service quality also affects customer satisfaction. A popular definition of service quality proposed by Berry *et al.* (1988) is 'conformance to customer specifications'—that is, it is the customer's definition of quality that matters, not that of management. Evans and Lindsay (1999) proposed the view that customer satisfaction results from the provision of goods and services that meet or exceed customer needs.

The service quality construct is mostly conceptualized in the context of service marketing literature (Lee, Lee and Yoo 2000). Therefore, it deals with the concept of perceived service quality. According to Zeithaml, Parasuraman and Berry (1990), perceived service quality is the extent to which a firm successfully serves the purpose of customers. Customers determine the perceived or cognitive value of service based on their experience with the service delivered. Ghobadian, Speller and Jones (1994) stated that customers' expectations, service delivery process and service outcome have an impact on perceived service quality. Yoo and Park (2007) found that employees, as an integral part of the service process, are a critical element in enhancing perceived service quality. Furthermore, Edvardsson (2005) pointed out that service quality perceptions are formed during the production, delivery and consumption process. The author concluded that customers' favorable and unfavorable experience, as well as their positive and negative emotions may have an important impact on perceived service quality. Similarly, O'Neill and Palmer (2003) have reported that customers' perceptions of service quality may, to a large extent, be influenced by the degree of their prior experience with a particular service.

Research on service quality gained momentum in the early 1980s. Initially the focus was on defining service quality. Lewis and Booms suggested that "service quality is a measure of how well the service level delivered matches customers expectations". Research by Gronroos (1982) focused on what he referred to as the "missing service quality concept." He argued there was a difference between technical quality, which describes what the customer gets, and is objective in nature, and functional quality which describes how the customer gets it, and is subjective in nature. Lethinen and Lethinen(1982) viewed quality from the customer's perspective and suggested that customers perceive process quality (the customer's qualitative evaluation of their participation in the service production process) and output quality (the customer's evaluation of the result of a service production process).

2.0 Measuring Service Quality in Higher Education

The constant struggle to measure the service quality has led to the creation of many models. In 1988, Parasuraman, et al. developed a model to measure Quality in service sector. The model was named as "SERVQUAL**"** relating to service quality. Parasuraman, et al. (1988, p.17) configured different factors that define quality in service sector and narrowed them to 10 dimensions namely, '(a) tangible, (b) reliability, (c) responsiveness, (d) communication, (e) credibility, (f) security, (g) competence, (h) courtesy, (i) understanding and knowing the customer and (j) access'. However after extensive research the base line was explored; the quality was described on the difference of the consumer expectations and perceptions (Parasuraman, et al., 1988; Carrillat, et al., 2007; Samat, et al., 2006; Guo, 2002; Pitt, et al., 1995; Wang, et al., 2008). The concept of Service Quality explained by Parasuraman, et al. (1988, p.16) as, 'service quality as perceived by the customer, stems from a comparison of what they feel service firm should offer (i.e. from their expectations) with their perceptions of the performance of firms providing the services'. SERVQUAL basically configures the gap where the

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quality improvement is required (Ho and Wearn, 1996; Rowley, 1997; Parasuraman, et al., 1988; Abdullah 2005, 2006a; Samat, et al., 2006; Awan, et al., 2008; Ruiqi and Adrian, 2009; Chowdhury, 2009). Despite its wide usage, the model has been criticized by a number of academics (Carman 1990; Babakus and Boller 1992; Teas 1994). Criticism was directed at the conceptual and operational base of the model, mostly its validity, reliability, operationalization of expectations, and dimensional structure. However, there is general agreement that servqual items are reliable predictors of overall service quality (Khan 2003).

Quality in higher education is a complex and multifaceted concept and a single correct definition of quality is lacking (Harvey and Green, 1993). As a consequence, consensus concerning "the best way to define and measure service quality" (Clewes, 2003) does not exist yet. Every stakeholder in higher education (e.g. students, government, professional bodies) has its own view of quality due to particular needs. Students receive and use the training offered by the university, which makes them priority customers of educational activities (Marzo-Navarro et al., 2005). Authors such as Sander et al. (2000), Gremler and McCollough (2002), and Hill (1995) also regard students as primary consumers of higher education service. This view, however, does not mean that other perspectives may not be valid and important as well. In this connection, Guolla (1999) rightly points out that students could also take the role as clients, producers, and products.

In higher education literature, Browne et al. (1998) and Guolla (1999) show that students perceived service quality is an antecedent to student satisfaction. Positive perceptions of service quality can lead to student satisfaction and satisfied students may then attract new students by engaging in positive word-of-mouth communication to inform acquaintances and friends, and they may return to the university to take other courses (Marzo-Navarro et al., 2005; Wiers-Jenssen et al., 2002; Mavondo et al., 2004; Schertzer and Schertzer, 2004). Student satisfaction has also a positive impact on fundraising and student motivation (Elliott and Shin, 2002). Winsted (2000) and Zeithaml et al. (1990) maintain that service providers will only be able to deliver service encounters that will satisfy customers if they know what their customers expect in general, and if they understand the critical employee behaviors and attitudes from a customer's point of view in particular. If lecturers know what their students expect, they may be able to adapt their behavior to their students' underlying expectations, which should have a positive impact on their perceived service quality and their levels of satisfaction.

To this extent, universities have become increasingly involved in defining service quality and measuring customer satisfaction in ways that are familiar to service marketing specialists (Gronroos, 1984; Kotler, 1985), who themselves were developing measures of service quality from the 1980s. As noted by Patterson *et al.* (1998) and Conant *et al.* (1985), the most important customers, namely students and their parents, and the university providers have progressively changed towards a customer service orientation. Against this background, there has been a rapid expansion in the literature about this aspect of service quality. However, the way in which it has typically developed – by identifying the attributes from consultation with the students and then evaluating these (Bourke, 1997; Gatfield *et al.*, 1999; Joseph, 1998; Thompson and Thompson, 1996) – has meant that there has been a great diversity and lack of consistency in methodological strategies and in the variables employed to assess the service quality (Leonard *et al.*, 2003). Some researchers in education have used SERVQUAL, which is the most popular model to measure service quality, sometimes specifically adapted for the education sector (Wright and O'Neill, 2002; Gatfield, 2000). Orr (2000) identified five groups of organizational determinants of success in the provision of fee-paying graduate courses. Pate (1993) split the literature on student satisfaction into three perspectives: psychological-wellness-type satisfaction (related to personal characteristics); job-type satisfaction (related to future aspirations); and consumer-type satisfaction (related to daily experience). However, the general picture is of profusion and indeed a confusion of measured variables, some replicated across different studies,

others unique to a particular study.

Parasuraman et al. (1985) argued that when service quality is high, it will lead to customer satisfaction. This argument has found support in a study by Saravana and Rao (2007) and Lee et al. (2000) who acknowledged that customer satisfaction depends on level of service quality of organizations. Fen and Lian (2005) found that both service quality and customer satisfaction have a positive effect on customers repurchase intentions, thus leading to loyalty. Similarly, a study by Magi and Julander (2009) showed a positive relationship between perceived service quality, customer satisfaction and attachment. Thus customer satisfaction results from high perceived service quality and this makes customers loyal. It is somehow the measurement of customer dissatisfaction (no satisfaction) and offers a possibility for the elimination of falls, not a possibility for product development and product innovation. Companies should gather and analyze the suitable data, which will provide relevant information to real customer satisfaction. It is important to measure the right things, i.e. what is really important for the customers. There is the possibility of wrong specifications or misinterpretations of what a customer actually wants (Kekale, 2001) (the gap between what companies think customers probably want and what customers really want). Criteria for the measurement of customer satisfaction must be defined by the customer. Many organizations determine the criteria for measurement internally, but "suppliers" rarely have an accurate understanding of customer priorities (Hill, 1996). It is a problem with measuring the performance dimensions that are not critical drivers of value to the customers (value in the eye of customers, not in the eye of organizations). The solution for this problem, to provide real insight into the market needs, is to filter out irrelevant information and concentrate on the few dimensions that really matter.

3.0 A Synthesis of Service Quality

Listing characteristics that are essential to service quality is one approach of assessing quality. Past researchers have applied the SERVQUAL instrument to identify a number of different compositions of the original version of SEVQUAL dimensions. This instrument measures service quality as a computable gap between customers' expectations about the service and their actual evaluations of that service in five dimensions. Table 1 below highlights some dimensions of service quality.

Table 1: Some Dimensions of Service Quality

Author	Year	Dimensions
1. Parasuraman et. al	1985	1. Reliability 2. Responsiveness 3. Competence 4. Access 5. Courtesy 6. Communication 7. Credibility 8. Security 9. Understanding 10. Tangibles
2. Parasuraman et. al	1988	1. Reliability 2. Assurance 3. Tangibles 4. Empathy 5. Responsiveness
3. Leblanc & Nguyen	1988	1. Corporate image 2. Internal Organization 3. Physical support of the service producing

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		system 4. Staff/customer satisfaction 5. Level of customer satisfaction
4. Robledo	2001	1. Tangibility 2. Reliability 3. Customer care
5. Philip & Stewart	1999	1. Pivotal Grouping 2. Core Grouping 3. Peripheral Grouping
6. Carman	1990	1. Admission service 2. Tangible accommodation 3. Tangible food 4. Tangible privacy 5. Nursing care 6. Explanation of treatment 7. Access 8. Courtesy afforded to visitors 9. Discharge planning 10. Patient accounting
7. Mels et. al	1997	1. Intrinsic 2. Extrinsic
8. Lehtinen & Lehtinen	1982	1. Interactive quality 2. Physical quality 3. Corporate quality
9. Sasser et. al	1978	1. Level of material 2. Facilities 3. Personnel
10. Freeman & Dart	1993	1. Tangibles 2. Timeliness 3. Assurance 4. Empathy 5. Fees 6. Professionalism 7. Exceptions 8. Accessibility
11. Edvardsson et. al	1989	1. Technical quality 2. Integrative quality 3. Functional quality 4. Outcome quality
12. Gronroos	1984	1. Technical 2. Functional 3. Reputational quality/image
13. Garvin	1987	1. Performance 2. Features 3. Conformance 4. Aesthetics 5. Reliability 6. Durability 7. Serviceability 8. Perceive quality
14. Theodorakis et. al	2001	1. Access 2. Reliability

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		3. Responsiveness 4. Tangibles 5. Security
15. Bouman & Van Der Weile	1992	1. Customer kindness 2. Tangibles 3. Faith
16. Reidenbach & Sandifer-Smallwood	1990	1. Outpatients 2. Emergency room 3. Inpatients
17. Vandamme & Leunis	1992	1. Technical quality 2. Integrative quality 3. Functional quality 4. Outcome quality

4.0 The Concept of Service Quality in Higher Education

The concept of 'service quality' is based on a customer-oriented perspective, evaluating the customer's level of satisfaction with the services provided by an organization. Berry (1995) argues that service quality plays an important role and can positively affect an organization. Bogue (1998) highlights the following three "perspectives" on quality common to institutions of higher education:

• *Limited supply*, often used in institutional rankings such as Macleans;

• *Quality within mission*, defined as "fitness for purpose"; and

• *Value-added*, or *quality in results*, defined by Astin (1985, cited in Bogue, 1998, p. 9) as the impact "on the student□s knowledge and personal development and on the faculty member□s scholarly and pedagogical ability and productivity".

Barnet (1994) identified four dominant contemporary conceptions of higher education. They are:

1. Higher education as the production of highly qualified manpower. On this view, graduates are seen as "products", as outputs having a utility value in the economy. Here, quality is a measure of the ability of students to succeed in the world of work. Accordingly, the quality measures will be the percentage of graduates flowing into employment and, more especially, their career earnings.
2. Higher education as training for a research career. Here, quality is measured less in terms of the achievement of students than in the research profiles of the staff. The performance indicators generated by this view of higher education is the related output and input measures of staffs' research ability.
3. Higher education as the efficient management of teaching provision. On this view, higher education has in the recent decades been transformed from an elitist system to massification. The result is that student demographics have changed and student numbers have increased. Institutions are therefore demanded to harness their resources so as to achieve an ever-higher level of efficiency. Institutions are considered to be of high quality if their throughput is high, given the resources at their disposal. Consequently, on this conception of quality, performance indicators are sought which can capture its heightened sensitivity towards efficiency. Non-completion rates and proportions of students obtaining "good degrees" are drawn on. So too, unit cost, especially as reflected in student-staff ratios themselves, as well as other financial data, come into play as key means of assessing the performance of institutions.

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4. Higher education as a matter of extending life chances. This conception is that of the potential consumers of higher education. Here, higher education is prized as a means of social mobility. It is value for its ability to offer opportunities to all to participate and enjoy the benefits of modern society. On this view of higher education, the key performance indicators lie in the percentage growth of student numbers and in the range of institutions' entrants. Do the figures reveal a widening of the intake to include students from the socio-economic backgrounds normally under-presented in higher education? Do they include significant proportions of mature students, of part-time students, and perhaps of disabled students?

Harvey and Green (1993) in their pioneering paper explored the nature and usage of quality in relation to higher education:

- Quality is often referred to as a relative concept. There are two senses in which quality is relative. First, quality is relative to the user of the term and the circumstances in which it is invoked. It means different things to different people, indeed the same person may adopt different conceptualizations at different moments. This raises the issue of 'whose quality?'. There are a variety of 'stakeholders' in higher education including students, employers, teaching and non-teaching staff, government and its funding agencies, accreditors, validators, auditors, and assessors (including professional bodies) (Burrows and Harvey, 1992). Each has a different perspective on quality. This is not a different perspective on the same thing but different perspectives on different things with the same label.
- Second, is the 'benchmark' relativism of quality. In some views, quality is seen in terms of absolutes. There is the uncompromising, self evident, absolute of quality (or 'apodictic' as Husserl (1969) calls it). 'As an absolute [quality] is similar in nature to truth and beauty. It is an ideal with which there can be no compromise '(Sallis and Hingley, 1991, p. 3). In other views, quality is judged in terms of absolute thresholds that have to be exceeded to obtain a quality rating (for example, the output has to meet a pre-determined national standard). In other conceptualizations, however, there is no threshold by which quality is judged, rather quality is relative to the 'processes' that result in the desired outcomes. If, for example, the product or service consistently meets its maker's claims for it then a product has quality, irrespective of any absolute threshold. Thus, some conceptualizations of quality are rather more 'absolutist' than others.

Rather than try to define one notion of quality, Harvey and Green (1993) argued that they could be 'grouped into five discrete but interrelated ways of thinking about quality'. Harvey (1995) provides the following brief overview of the five categories:

1. The *exceptional* view [of quality] sees quality as something special. Traditionally, quality refers to something distinctive and élitist, and, in educational terms is linked to notions of excellence of 'high quality' unattainable by most.
2. Quality as *perfection* sees quality as a consistent or flawless outcome. In a sense it 'democratises' the notion of quality and if consistency can be achieved then quality can be attained by all.
3. Quality as *fitness for purpose* sees quality in terms of fulfilling a customer's requirements, needs or desires. Theoretically, the customer specifies requirements. In education, fitness for purpose is usually based on the ability of an institution to fulfil its mission or a programme of study to fulfil its aims.
4. Quality as *value for money* sees quality in terms of return on investment. If the same outcome can be achieved at a lower cost, or a better outcome can be achieved at the same cost, then the 'customer' has a quality product or service. The growing tendency for governments to require accountability from higher education reflects a value-for-money approach. Increasingly students require value-for-money for the increasing cost to them of higher education.

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5. Quality as *transformation* is a classic notion of quality that sees it in terms of change from one state to another. In educational terms, transformation refers to the enhancement and empowerment of students or the development of new knowledge.

Campbell and Rozsnyai (2002, pp.19–23) discuss the concepts of quality as follows:

> There are many different understandings of the term, quality, often reflecting the interests of different constituencies or stakeholders in higher education. Thus, quality is a multidimensional and often a subjective concept…. Conceptions of quality were categorized by Harvey and Green (1993), and were elaborated in the PHARE Manual of Quality Assurance: Procedures and Practices (1998). They include the following:
>
> 1. Quality as excellence. This definition is considered to be the traditional academic view that holds as its goal to be the best.
> 2. Quality as "zero errors". The idea of "zero errors" is defined most easily in mass industry in which product specifications can be established in detail, and standardized measurements of uniform products can show conformity to them. As the "products" of higher education, the graduates, are not expected to be identical, this view is not always considered to be applicable to higher education.
> 3. Quality as "fitness for purpose". This view requires that the product or service meet a customer's needs, requirements, or desires. Learners (students) and prospective learners, those who fund higher education, the academic community, government, and society at large are to a greater or lesser extent all clients or users of higher education but may have very different views of both "purpose" and "fitness"….
> 4. Quality as threshold. Defining a threshold for quality means setting certain norms and criteria. Any programme, department, or institution, which reaches these norms and criteria, is deemed to be of quality….
> 5. Quality as value for money. The notion of accountability is central to this definition of quality …
> 6. Quality as enhancement or improvement. This concept emphasizes the pursuit of continuous improvement and is predicated on the notion that achieving quality is central to the academic ethos and that it is academics themselves who know best what quality is at any point in time. Disadvantages of this concept are that it is difficult to "measure" improvement and that the evidence of improvement may not be easily discernible to the outside world.

Some of these concepts of quality still hold true especially when explicit quality assurance and accreditation procedures are being developed and introduced for the first time either at system or at institutional level. But, notions of quality are evolving or merging, either as the result of the changing context in which higher education institutions are operating in some countries, or as a result of growing expertise within higher education systems and institutions in devising their own concepts of quality and models of evaluation and quality management. Mismatches between the requirements of the external quality assurance agency and institutional approaches to quality can be a cause of tension in relations.

Institutes of higher education, through their curriculum, are expected to provide knowledge, know-how, wisdom, and character to the students. "Knowledge" enables them to understand what they learn in relation to what they already know, and creates an ability to generalize from their experiences. "Know-how" takes them beyond merely understanding and enables them to put their knowledge to work. "Wisdom" makes them capable of deciding their priorities. 'Character' development is the combined effect of knowledge, know-how, and wisdom, coupled with motivation. Character development is recognized by certain traits, viz., honesty, integrity, initiative, curiosity, truthfulness,

cooperativeness, self-esteem, and ability to work alone and in a group. However, most of the educational institutions hardly pay any attention to the development of either wisdom or character. Many educators have not developed wisdom themselves and hence throw up their hands at the thought of imparting it to the students. They think that these elements are to be taken care of by someone else. Wisdom and character, the two important human Qualities, are best developed by making students participate in creative team activities, wherein they learn to set priorities, to work together, and to develop the social skills required in a society where teamwork is essential to success.

5.0 Managing Quality in Higher Education

Quality management includes all the activities that managers carry out in an effort to implement their quality policy. These activities include quality planning, quality control, quality assurance, and quality improvement. Managing quality in higher education has proved to be a difficult and challenging task. The literature suggests that there are two main reasons for this. First, quality has different meanings for different stakeholders. Within higher education there are both internal and external stakeholders who are likely to have different or even contradictory definitions of quality. As a result of the difficulty in defining quality, its management has unsurprisingly proved to be disputed. Traditionally, external stakeholders have been concerned with quality assurance procedures. Quality assurance refers to the planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality (Borhan and Ziarati, 2002:914).

The focus on quality for external stakeholders is driven by these agendas and focuses predominantly on the measurement of procedures and the extent to which they result in appropriate levels of quality (Jackson, 1996). This requires higher education institutions to demonstrate responsible actions in their professional practices and accountability in the results they achieve with the resources used (Jackson, 1998:46). Elton (1992) refers to these as the quality „As accountability, audit and assessment – and suggests that they are concerned with the control of quality and the people who control quality. Particular mechanisms for assurance, such as accreditation and quality audits, are usually imposed by government and other external bodies (McKay and Kember, 1999). Harvey (2005:264) suggests that accountability underpins these processes but under the banner of efficiency and effectiveness.

Avdjieva and Wilson (2002) suggest that higher education institutions are now also required to become learning organizations, where internal stakeholders also interpret and assess the quality of higher education provision. The emphasis for internal stakeholders is not only on quality assurance, but also on quality enhancement which aims for an overall increase in the actual quality of teaching and learning, often through more innovative practices (McKay and Kember, 1999).

Srikanthan and Dalrymple (2002) present a generic quality management model addressing the educational process, synthesizing the transformative model, the engagement model of programme quality, the learning model and the responsive university model. The features of their generic model addressing quality management in higher education, based on the previous set of models, can be summarized as follows.

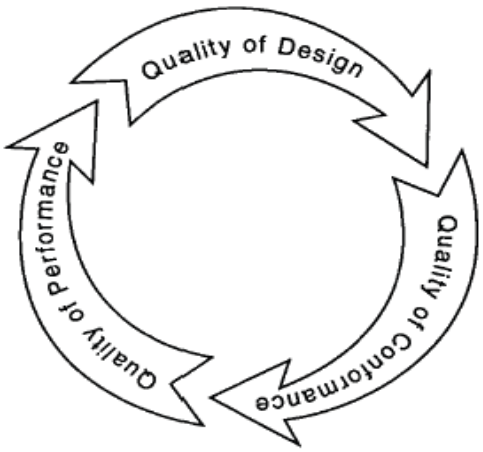
a. "A clear focus on 'transformation' of the learners, enhancing them through adding value to their capability and ultimately '*empowering*' them" (Srikanthan & Dalrymple, 2002, p. 220). Thus, quality policies have to be learning - oriented and should be centered on the student experience.

b. A synergistic collaboration at the interface, which transcends not only the traditional power relationships (i.e. teacher ‐ student), but breaks the barriers among organizations and reaches out into developing new external partnerships within the community. "This means being student centered in programmes, community ‐ centered in outreach and nation centered in research" (Srikanthan & Dalrymple, 2002, p. 218).

c. There is an important role for leaders in higher education institutions to encourage and ensure an appropriate collegial culture.

The three quality dimensions model was developed by Mergen et al. in 2000. It discusses a set of measurement parameters to be used in evaluating the quality of education and the tools necessary for evaluating them. Their quality management framework is comprised of three dimensions: quality of design (QD), quality of conformance (QC) and quality of performance (QP). An overview of the model is shown in Figure 1. This figure suggests that there is a logical flow from QD to QC and QP. For example, low QP may lead to changes in the QD and/or QC. Similarly, low QC may require better quality control techniques or changes in the design stage. A brief description of these three parameters is provided below. *Quality of design* deals with determining the characteristics of a good education in a given market segment at a given cost. It is determined by three factors: (1) the quality of the insights gained about stakeholders and the depth of understanding of their requirements; (2) the quality of the process used to translate these requirements into a product and/or service that provide value to stakeholders; and (3) the continuous improvement of the design process.

Figure 1: Relationship between the components of the model.



Quality of conformance deals with how well the designed requirements (i.e. the education ideals of a higher education institution) are satisfied, including the cost requirements, uniformity and dependability. QC is determined by the minimization of variance from design requirements for the products and/or services. Thus, for each design specification, a proper measure or measures should be developed in order to make sure that design requirements are being met.

Quality of performance deals with how well the education serves the students in their environment. It is a measure of the value that students derive from their education. QP measures include the level of endowment, stakeholder satisfaction, tuition revenues, student enrolment, salaries of fresh employers and career advancement.

In his model, Veress (1999) examines quality management of higher education from an engineering perspective. He defined the notion of quality as the satisfaction of stakeholders. He stresses that only

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the ‘demand‐satisfaction process’ has quality according to the modern quality management interpretation, while production or consumer processes alone do not. In order to improve quality it has to be known and measured (estimated). Organizations can measure the quality of education, the satisfaction of stakeholders, etc. but if they do not have clear educational processes, regulation processes and conformity control processes they cannot reproduce the processes under the same conditions. Organizations can declare the satisfaction of stakeholders but they do not know what kinds of activities and processes produced it. Thus, they do not know what to change for improvement. Therefore, he emphasizes a clear description of educational and secondary processes concerning educational ones, the regulation of processes, conformity control processes and last, but most importantly, quality control processes (satisfaction of stakeholders). Furthermore, he stresses the importance of a ‘goal‐oriented’ quality management system where a goal system is needed for regulating these activities. The quality goal system must be derived from organizational quality policy, which should be derived from the organizational mission.

6.0 Conclusion

The challenges of the higher education institutions imply that service quality attributes are needed to satisfy the students. The long term objective is to raise the student satisfaction with regard to important service attributes in order to establish a quality service to students. Majority of approaches towards quality in higher education described in this paper are represented in all higher education systems but as the systems are different in many countries, one can observe variations that are mainly connected with emphasize. We should also bear in mind that quality in higher education is affected by tightly interrelated factors and in order to give potentially the most adequate assessment to quality, one has to research as many factors as possible and necessary.

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The Effect of the Adopted Computerized Human Resources Information System on Job Satisfaction in the Jordanian Private Hospitals

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ABSTRACT

Organizations in the information age are thriving to understand and digest the overwhelming amounts of information and raw data within their environments with great efforts to turn these bits and pieces of information into a set of meaningful knowledge that forms their intellectual capitals which could be used to alter the whole organizational performance. This study came in line with this trend in order to better understand the relationship between the adopted computerized human resources information system in the hospitals of the private sector within the Greater Amman Municipality Area (GAMA), and the corresponding human resources management practices in those hospitals and its effect on the employees job satisfaction as one indicator of the organizational performance.

Three questionnaires were developed (one of them was a structured interview) as measurement tools for the variables of this study which included 13 private hospitals within the GAMA where they have already adopted a computerized human resources information systems. The proportional sampling method was used to sample 442 employees within those hospitals. Simple and multiple regressions and the ANOVA tests were used to test the hypotheses of the research in addition to the resulting descriptive statistics.

The study showed a direct relationship between computerized human resources information systems features, and the effectiveness of human resources management policies and practices.

More efforts are recommended to improve and develop the features of the adopted human resources information systems features like the human resources self services,

Keywords: HRIS, Job Satisfaction, Hospitals, Human Resources, Information Systems

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INTRODUCTION

In a rapidly changing business world, the process of defining strategies for the development of workforce is ongoing. Human Resources (HR) departments are doing their best to convert those strategies into practical instruments. Increasingly, they are using the supportive information systems, known as human resource management information systems (HRMIS or HRIS systems) to define, maintain and monitor processes of human resources management (HRM).

It is known that one of the most important tasks of the HR department is serving personnel inside the organization, or internal customers. Adopting a computerized HRIS will elevate the level of services for those internal customers as argued by so many specialists and software vendors. Such improvement is indirectly related to job environment of the personnel inside organizations; thus this study would be investigating the effect of the adopted computerized human resources information systems on employees' job satisfaction.

Information Technology

As we are in the beginning of a new century, a transformation is occurring in many organizations where quality, innovation and values are replacing the drive toward short-term efficiency, and information technology is being enabled in almost every aspect of any organization's function. People are rediscovering the critical importance of human resources; old methods of command and control are being replaced by new methods of managing human resources.

Technological advances are revolutionizing the way organizations manage HR information and technological changes may even be helping redefine the role of HR in the organization. Now, due to opportunities presented by technology, some are calling for a transformation of HR from a strategic partner to an agent of change (Wright et al., 1999). Instead of shuffling paper work and fielding phone calls; HR managers use the internet to obtain information and communicate with others, affecting virtually every HR function. HR database management systems maintain organizationally relevant information about employees. Advances in computer hardware and software have not only made possible user-friendly access to employee information, but also enable us to analyze this information for the purposes of organizational planning (Konrad and Deckop, 2001).

Information Systems and the Organizational Performance

Shannak (1994) investigated the effect of management information systems on the corporate performance of the Jordanian share-holding companies. His study aimed at exploring the extent to which management information systems (MIS) are available in Jordanian share-holding companies, the degree of utilization and their effect on the corporate performance. It is also worth mentioning that the study was conducted on 53 share-holding companies.

Management information systems were measured using four determinants namely: hardware and software, behavioral, structural and environmental factors. The study also made extensive use of personal interviews with the personnel in the respective companies. In addition, financial figures related to return on investment (ROI) were used as a reflective measure of the corporate performance.

The study has arrived to the following conclusions:

- The relationship between the presence of a specialized departments dealing with management information systems and the corporate performance (as an ROI) was found minimal.
- Same could be said about the relation between using the computers and the corporate performance (as an ROI); it was also found minimal.
- Management information systems were found to have no significant influence on the corporate performance.
- Behavioral factors influencing the development and use and maintenance of the MIS were found to have no significant effect on the corporate performance.
- Structural factors influencing the development and use and maintenance of the MIS were found to have no significant effect on the corporate performance.

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- Environmental factors influencing the development and use and maintenance of the MIS were found to have no significant effect on the corporate performance.

Al-Nathere (1990) studied information technology and its effect on the effectiveness of decisions in Jordanian banking sector. The intention was to identify the importance of information systems to the effectiveness of decision making process in 11 of the Jordanian banks; the study concluded the following:

- There is a positive relationship between the management information systems adopted in the studied banks with the effectiveness of decision making. The study found that this relationship is not of a statistical significance.
- There was no indication that better managed that depended on advanced management information systems had better profitability in comparison to other banks.
- The final result for the degree of effectiveness of information systems was 69%.

Akeal (1996) also focused on the banking sector, he analyzed the use of information systems as a competitive tool in the Jordanian banks. Results showed that the bank (which was selected as a case) used its information system as a competitive advantage and a strategic tool. The study has recommended further use and enhancements for information system, Decision Support Systems (DSS) and Automatic Teller Machines (ATM).

Human Resources Information System (HRIS)

Despite more recent claims suggesting that HRM is lagging in terms of IT usage, this was not the case 30 years ago. Beginning in the 1960s, personnel management was an early candidate for office automation in payroll, benefits administration and other transaction processing applications such as employee record holding. Typically this information was held on a mainframe in flat file format with the databases being interrogated via simple keyword searches. Since then, computer usage in HR has been characterized by "alternating periods of slow and rapid growth". HRIS is defined as an application which is used to acquire, store, manipulate, analyze, retrieve and distribute information about an organization's human resources (O'Brien, 2004).

In practice, there is a split in analysis of HRIS usage, with literature predicting that there will be at least two extremes of use. For example, some literature noted that HRIS information could be used, first, for administrative purposes which reduce costs and time and, second, the more analytical decision support. Similarly, some of the literature classified different types of HRIS usage according to its degree of sophistication, and argued that payroll and benefits administration, and keeping employees absence records electronically was "unsophisticated" because of its electronic replication of the contents of the HR department's filing cabinet. On the other hand, the use of IT in recruitment and selection, training and development, HR planning and performance appraisal was characterized as "sophisticated", because of the information generated to provide support for decisions which involve expert's judgment.

Human Resources Management

Strategic human resource management (SHRM) is increasingly seeking a strategic role in business to help firms create value and gain competitive advantage in the marketplace. Respondents to the SHRM in **1997** Human Resource Trends Survey (SHRM, 1997) indicated that leading organizational change initiatives, working with management operations, and developing strategy were the top three areas where HR is increasing its contribution to organizational effectiveness. Empirical research has established a link between HR practices and firm financial performance (Becker et al., 1998).

Effective HR practices that competitors cannot duplicate easily or quickly provides a competitive advantage to firms (Jackson and Schuler, 1995). HR can create value by developing systems to make the firm an ***employer of choice*** to attract and retain top quality talents. Becoming an ***employer of choice*** is costy, however, and these costs are only justifiable if the firm's workforce demonstrates high

productivity. For this reason, Becker and Huselid (1999) argue that combining an employer of choice strategy with a high performance work system is most likely to lead to enhanced firm financial performance. US firms increasingly use high performance work practices; in a longitudinal study of 462 establishments with at least 50 employees, Osterman (2000) found that the percentage using quality circles increased from 29 percent in 1992 to 59 percent in 1997. The use of job rotation increased from 24 percent to 47 percent during the same time period, and Total Quality Management (TQM) increased in frequency from 24 percent to 51 percent. The use of teams remained constant at about 40 percent in both years.

According to Wright and Rudolph (1994) the most significant change in the workplace, among others, is the increased emphasis on HR policies that facilitate organizational performance. And it is specially the case in the private sector that can improve its competitive advantage by doing so. The study clearly indicated that companies with progressive HRM policies tend to be more successful than firms with traditional outlooks.

The emphasis on HRM and performance also is found in the public sector, where non-profit organizations and all levels of government are seeking to maximize the productivity of employees and improve the quality and delivery of services.

The diverse literature on HRM focuses on the development of a better performing organization. Some of the many new concepts being considered include world class organizations, linkages to corporate strategy, global mindsets, partnerships, high-involvement management, healthy corporate cultures, core competencies, and the "winning organization".

In addition, HR resources and functions can become a strategic partner by providing tactical support for implementing a business strategy. HR is needed to determine the types of knowledge and skills needed in the workforce to carry out the firm's strategy, identify hiring and training needs, and align the performance management system with strategic goals. HR can also ensure that strategy is implemented in ways that are perceived as fair. Research has showed that employees responds in more positive way to change when management provides rational explanations of the need for the initiative and when it uses fair procedures to implement the initiative and when the management expresses caring for the fate of employees (Moorman et al., 1998).

METHODOLOGY

Research Model

The model below was constructed to test and investigate the relationship between the independent variable which is the computerized human resources information system, and the dependent variable which is employees' job satisfaction while taking into consideration the effect of the intervening variable which is the human resources management practices and the moderating variable which is the organizational culture. The model is shown in figure 1.

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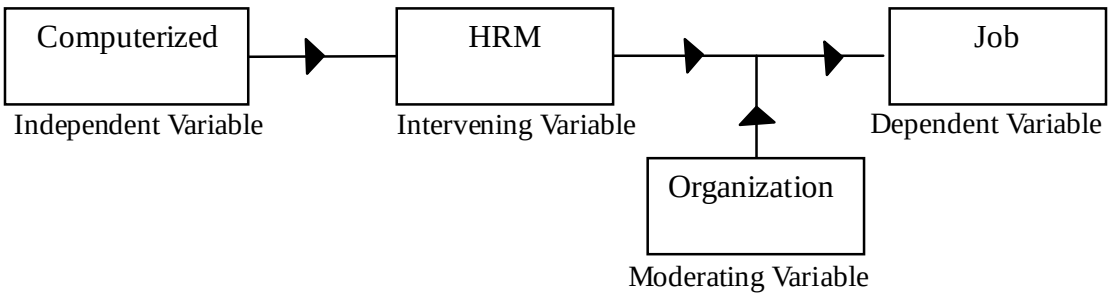

Figure 1: Research Model

Three questionnaires were developed (one of them is a structured interview) as the measurement tools

for the variables of this research.

Hypothesized Variables Relationships

The main hypothesized relationship as presented in the research model above is that features and specifications of the computerized HRIS in organizations will affect the effectiveness of HRM policies and practices in those organizations. Furthermore, and given the hypothesized relationship between the computerized HRIS and the HRM policies and practices, this would also have a hypothesized impact on the job satisfaction of the employees of those organizations because of the improved HRM policies and practices and because computerized HRIS is brought to serve those employees in a better way.
To have a rational relationship (as indicated by previous studies and literature) between HRM practices and employees job satisfaction; organizational culture will be incorporated into the hypothesized model so as to moderate this relationship and understand the values of the employees job satisfaction for a certain organization according to the prevalent organizational culture in that same organization.

Research Hypotheses

Research hypotheses are divided into primary and secondary hypotheses, the primary hypotheses are listed below:

First Hypothesis:

H_o: There is no significant relationship between all of the components of the computerized HRIS and the well being of the HRM practices.

Second Hypothesis:

H_o: There is no significant relationship between HRM practices and employees job satisfaction.

Third Hypothesis:

H_o: There is no significant relationship between all of the components of the computerized HRIS and employees job satisfaction.

Fourth Hypothesis:

H_o: There is no significant difference in the relationship between HRM practices and employees job satisfaction according to the prevalent organizational culture.

Research Population and Sampling

The researchers have chosen private sector hospitals in proximity of the capital Amman, as the research population, for its importance and applicability of the research to this sector (due to practical reasons). Industries such as the health-care sector are very much dependent on people whom are offering a wide range of core and support services. It is therefore true that, in this particular instance, people are the most valuable resource. Since significant amounts of money are deployed regularly in recruiting, training and developing people, it becomes therefore imperative to address the area of human resources management properly in this sector.
The researchers were able to conduct the study on only 13 private hospitals, which covered 62% of research's total qualified hospitals; those 13 hospitals are employing 72% of the research's qualified hospitals workers. As a matter of fact, and supported by those two percentages mentioned above, it is clear that the sampled hospitals included the largest hospitals within the total number of qualified hospitals, and which comprised more weight due to their higher number of workers. This explains why the 72 percent (that represent the sampled hospitals workers) is higher than the 62 percent (that represent the number of sampled hospitals). The needed sample size was calculated to be 361, while the actual number of collected employees' questionnaires from the sampled hospitals was 442. Table 1

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summarizes the numbers of collected questionnaires from each of the three used measurement tools.

Table 1: Collected Questionnaires for Each Measurment Tool

Measurement Tool	Collected Questionnaires
Computerized HRIS Structured Interview	13
HRM Practices Questionnaire	32
Employees Questionnaire	442

RESEARCH FINDINGS

Figure 2 shows the sampled hospitals and the averages of the four variables of the research model. This histogram summarizes the findings of the research by giving the average collected values for each of the four variables of the research.

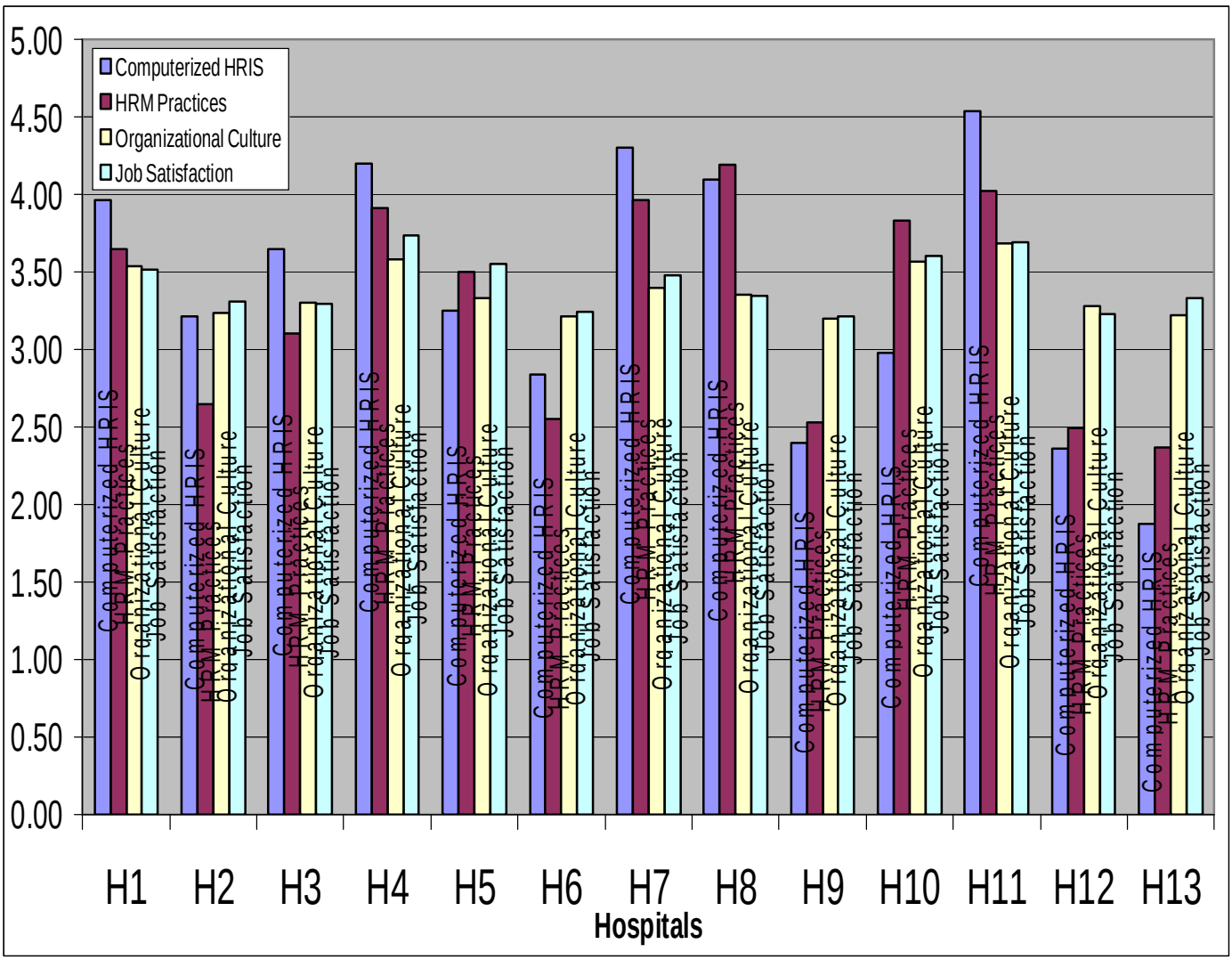

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Figure 2: Sampled Hospitals and the Four Variables of the Research Model (on a Standardized Five Point Scale).

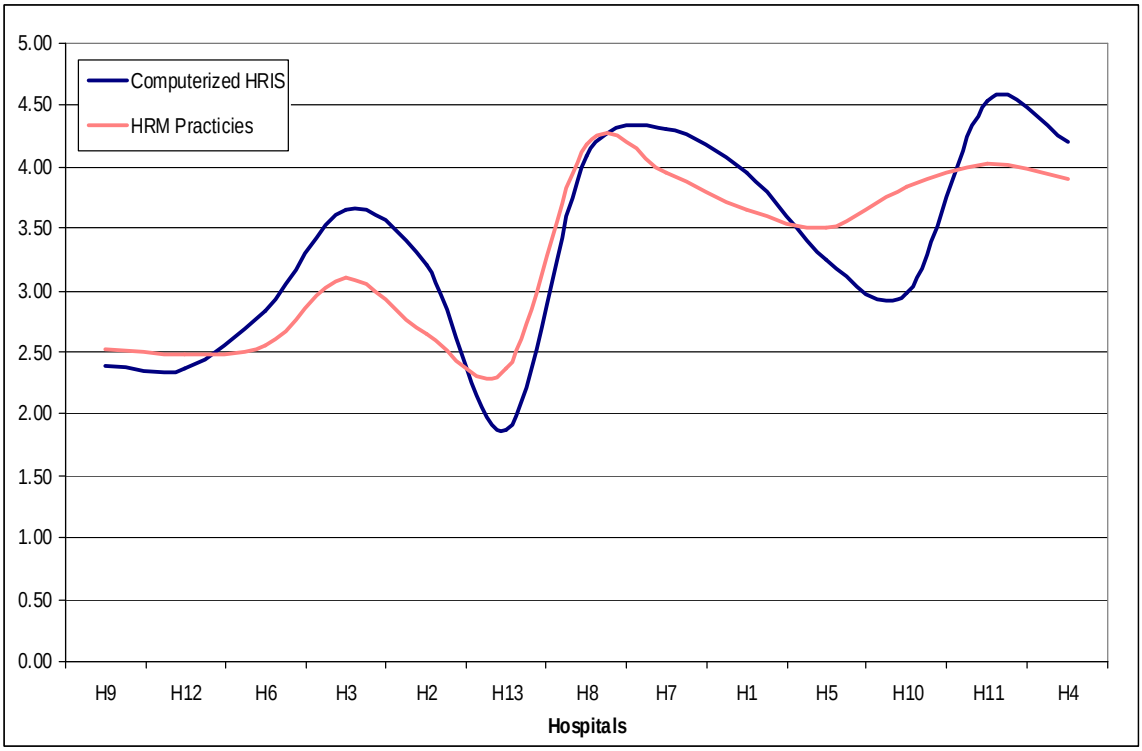

Figure 3: Relationship between HRIS and HRM Practices

Using the figure's five points scale (standardized to 5 points regarding the HRM variable), it was noticed that in some hospitals computerized HRIS is scoring higher than the HRM practices (as indicated in figure 3), while in other hospitals it is the other way around; which brings forward the following question: which one of these variables is actually driving the other, or is it just a state of mutual correlation between those two variables.

It is logical and confirming to some of the literature to find such a relationship; maybe the reason behind such relationship is that the computerized HRIS features changes the way things are done in the HR department, taking it from the manual way of keeping the personnel records, preparing the various reports by hand, updating personnel information on paper files, performing manual transactions and calculating payroll manually for each employee to other side of spectrum were those functions are automated through a computerized HRIS. In brief, computerized HRIS will transform the HR department staff from being immersed in day-to-day manual and repetitive transactional level of HRM into becoming handlers of higher levels of operations within the HRM functions, like becoming administrators and regulators of personnel information, policies makers, preparing internal organizational environment to retain and recruit qualified personnel in the organization.

***Second Hypothesis**:*

The null hypothesis H_o was ***rejected***, which means that there is a relationship between HRM practices and employees job satisfaction but with much lower R value than the previous hypothesis. Figure 4 如下 plots the average score of job satisfaction along with the average score of HRM practices in each of the visited hospitals (standardized scale), the sequence of hospitals on the x-axis is sorted so that the average job satisfaction is increasing.

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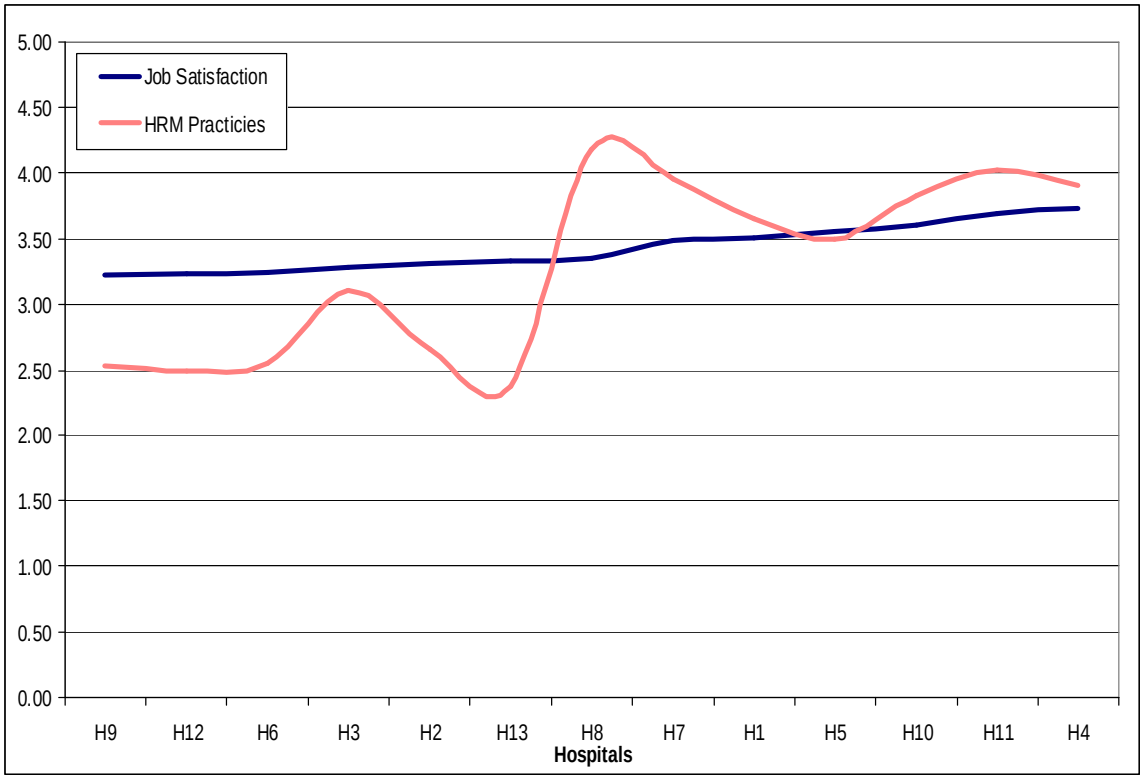

Figure 4: Relationship between HRM Practices and Job Satisfaction (Hospitals are Sorted Increasingly by Job Satisfaction)

According to the hypothesis testing mentioned above, it is noticed that the R value is relatively low and this is explained by the alterations or fluctuations in the HRM practices while the job satisfaction is increasing. Also, the low R value between those two variables is explained by the presence of other factors influencing the job satisfaction in the organizations, for example like the organizational culture that will be investigated in a subsequent hypothesis.

Another supporting reason for the low R value is the small range of variation in average job satisfaction, it was noticed that the sampled hospitals were having a relatively similar values for average job satisfaction as indicated in Figure 4 previously. Minimum average value (in a hospital) was found to be 3.21 and maximum average value (in a hospital) was found to be 3.73 which mean that the range of variation is only half a degree on a five point scale.

Third Hypothesis:

The null hypothesis H_o was ***rejected***, which means that there is a relationship between all of the components of the computerized HRIS and employees' job satisfaction but with much lower R value than the first hypothesis.

Figure 5 plots the two variables of this hypothesis that are the computerized HRIS along with the average job satisfaction in each of the visited hospitals, the sequence of hospitals on x-axis is sorted so that the average job satisfaction is increasing.

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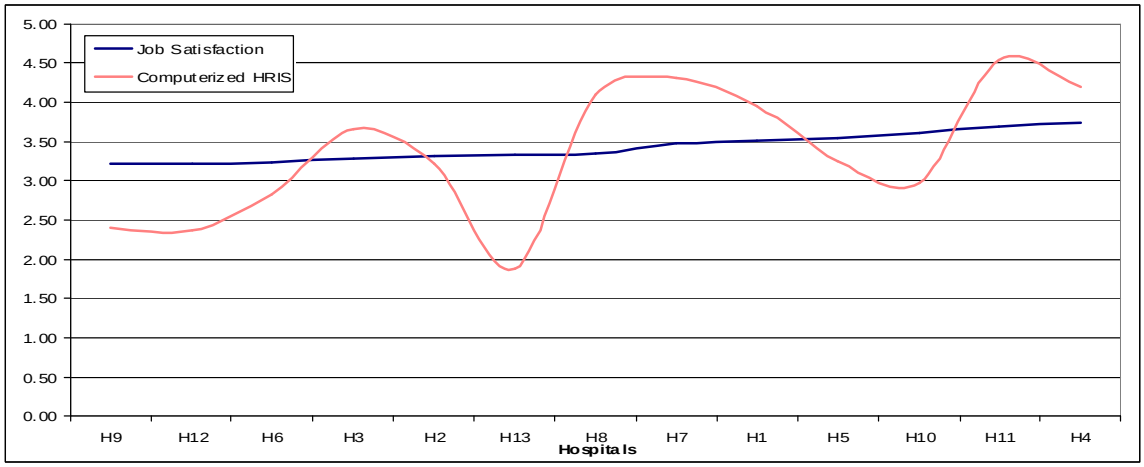

Figure 5: Relationship between Computerized HRIS and Job Satisfaction (Hospitals are Sorted Increasingly by Job Satisfaction)

Similar to hypothesis number 2, there is a relationship between computerized HRIS and job satisfaction with an R value that is also very near to the R value of the hypothesis number 2, but with higher fluctuations and alterations in values of HRIS according to (if compared to the figure that explains the variables of hypothesis number 2). According to results in both of the hypothesis number 1 and hypothesis number 2, it is logical to expect by ***substitution*** a result such as the one attained in hypothesis 3.

Fourth Hypothesis:

The null hypothesis H_o was ***accepted***, which means that there is no difference in the relationship between HRM practices and employees job satisfaction according to the prevalent organizational culture. Results of this hypothesis is contradicting with the research for Mallak et al. (2003) about organizational culture in the healthcare organizations and its effect on the organizations performance (including employees and customers satisfaction and other variables); where they concluded that culture strength's links with higher performance levels and identified the built environment's role as a ***moderating*** variable that can lead to improving processes and outcomes. At the same time, it coincides with Mallak et al. (2003) research, where the job satisfaction was found to be significantly and positively correlated with culture strength. Figure 6 is a plot between the average organization culture values and the average job satisfaction in each of the sampled hospitals; the sequence of hospitals on the x-axis is sorted so that the average job satisfaction is increasing.

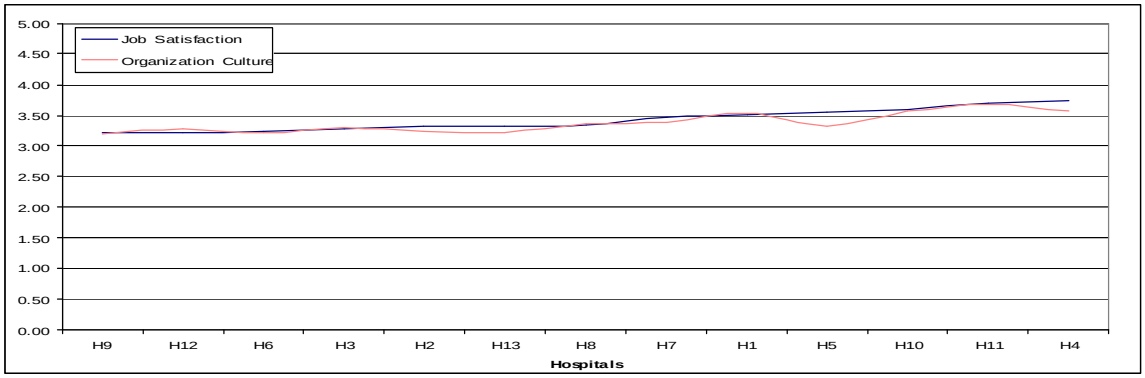

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Figure 6: A Plot between the Job Satisfaction and the Organization Culture (Hospitals are Sorted Increasingly by Job Satisfaction)

The reason why the null hypothesis was accepted could be interpreted from figure 6. There is an almost perfect matching or overlapping between average organizational culture line with average job satisfaction line, and hypothesis number 2 result proved the relationship between the HRM practices and job satisfaction without the need of organizational culture as a moderating variable (i.e. adding organization culture as a moderating variable will not actually modify or moderate in a better way the existing relationship between HRM practices and the job satisfaction).
Furthermore, this relationship was noticed from actual values (not averages) obtained from the respondents of employees questionnaires that the scoring of the culture and the scoring of job satisfaction were coinciding to each others; which brings us to the conclusion that organization culture actually affects the employees job satisfaction as mentioned earlier in the literature review.

CONCLUSIONS AND RECOMMENDATIONS

The following points summarize results and conclusions deduced from the study:

- The study was able to prove a direct relationship between the computerized human resources information systems features, and the effectiveness of human resources management policies and practices.
- The presence of effective and positive human resources management practices was found to have mild positive effect on both of the employees' job satisfaction and organizational culture in the studied sector. Accordingly and similarly, computerized human resources information systems features and functionality was found to have a mild positive effect on employees' job satisfaction.
- The study rejected the alternative hypothesis that says that a relationship exists between human resources management practices and employees job satisfaction according to the prevalent organizational culture (as a moderating variable).

Consequently, the study recommended the following:

- Improve and develop features of the adopted human resources information systems so as to include the already known and advanced features like human resources self services, advanced query tools, decision support capabilities, HR performance indicators and the computerized workflow.
- More effort could be exerted by workers and their representing unions in association with the legislators, managers and HR departments of Jordanian firms to improve the HR legislations and the human resources management policies and practices; this should be done in an effort to bridge the gap with the HR legislations, policies and practices already implemented by the industrialized countries.

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The impact of organizational learning disciplines upon the performance of the public sector: Case study at Ministry of Planning and International Cooperation

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Sawsan Abu Alghanam
Amin Shaqrah

Abstract

This study discusses the relationship between organizational learning and the performance of ministry of planning and international cooperation "MOPIC" .The impact of five organizational learning disciplines includes: personal mastery, mental models, shared vision, team learning and systems thinking upon the performance. Data was collected from "MOPIC" through the adopted questionnaire. The results show that the organization learning disciplines have a significant impact to increase the organizational performance.

Keywords: Organizational learning, public sector performance, ministry of planning and international cooperation, Jordan.

Introduction

According to the vital role that the public sector plays it at achieving the social and economical development and related to king abdullah II initiatives that include enhancing and developing the government performance by adapting a national agenda in addition to develop executive program, and within the rapidly change at the information technology and the global environment as well. The public sector has follow this changing by improve the government performance to be able to meet the individuals expectation also to implement what the government planned for "MOPIC" as a pilot ministry ,their main goals include supporting and directing development initiatives aimed at raising the standards of living and improving the national economy .strengthening and enhancing technical, financial and economic cooperation with donors, international organizations and financing institution ,while steering assistance in line with socioeconomic priorities within the framework of the national agenda, in addition to its role to follow up the execution of the national agenda.

So "MOPIC" according to the above goals has to works at enhancing the ability to improve its performance , and that might be at organizational learning ,because it could be managed the government to improve its performance to reach the excellence performance in order to be able to produce and provide the goods and services that met the individuals expectations. This study tries to find out if the organizational learning really exists at "MOPIC" and the government as all. Also to find out to what extent the organizational learning affects the performance of the public sector to be excellence. Our study discussed the organizational learning dimensions depending on the five disciplines of Sengs (2004) - personal mastery, mental models, shared vision, team learning, and, system thinking- to find their effect on the performance of the public sector. The performance in at the private sector could be measuring by the profitability or by growth, but for the public sector it is hard to measure the performance because it is intangible one. So the study will find the relationship between the organizational

learning and the performance of the public sector through find out the effect of each discipline of Sengs on the performance.

Literature review

Senge (1990) defined learning organization as "where people continually expand their capacity to create results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together". Learning in organization means the continuous testing of experience, and the transformation of that experience into knowledge, accessible to the whole organization, and relevant to its core purpose (Senge, 1994). Daft & Weick (1984) defined organizational learning is knowledge about the interrelationships between the organization's action and the environment. Fiol & Lyles (1985) also defined organizational learning as the process of improving actions through better knowledge and understanding. Lee et al. (1992) pointed out the organizational learning process is viewed as a cyclical one in which individual's actions lead to organizational interactions with the environment. Environmental responses are interpreted by individuals who learn by updating their beliefs about cause effect relationships. Dimovski (1994) mentioned the organizational learning is a process of information acquisition, information interpretation and resulting behavioral and cognitive changes, which should in turn have impact on organizational performance.

Slater & Narver (1995) defined organizational learning as a development of new knowledge or insights that have the potential to influence behavior. Sanchez (2001) stated the aim of Organizational learning is to generate, disseminate, and apply knowledge in an organization. It is crucial to manage organizational learning processes within these organizations in order to successfully compete. For this reason management need to understand how organizational learning processes take place. Sustained learning is an essential process of an organization's ability to be adaptive and flexible to survive and effectively compete (Burke et al., 2006). Due to these reasons Organizational learning is an important source of a company's sustainable competitive advantage (de Geus 1988). Lopez et al. (2004) mentioned to the existence of four constructs which are integrally linked to the learning process acquisition of knowledge through external sources or internal development: distribution, through which knowledge is spread among all the members of the organization: interpretation, which allows individuals to share and incorporate of their knowledge, which are not common to all of them, gaining in such away shared understanding and coordinating decision taking, and finally organizational memory, which tries to stock knowledge four future use, either in organizational systems designed for this purpose or by means of rules, procedures and systems. Gupta et al., (2000) stated that organizational learning demands a high degree of commitment at all levels of the organization, which entails a culture that bases its potential on the desire to improve, learn, and shared by all the members of the organization.

Senga et al. (1999) pointed out the manager must be willing to lose some of their power and, on the other hand, the individual must be able to take the risks and responsibilities that they are asked to and to share the failure or success of the project and of the enterprise. Nonaka (1995) presented five factors for organizational learning: The factors are acquisition of knowledge, sharing of knowledge, constructing meaning, organizational memory, and retrieval of information. The learning process in firm will be very wide ranging one involving the obtaining of knowledge from existing organization, the combining of knowledge and generation of new uses for the resources. Bointis et al. (2002) mentioned to the positive relationship between the stocks of learning at all levels and business performance. Thus the successful organization is one that can assimilate new ideas and transfer these ideas into action faster than competitors. Markus and Benjamin (1997); Willcocks et al. (1997) mentioned the

management information system research has noted that organizational learning processes are increasingly important in identifying successful IT-based investments and creating IT enabled change. Tallon et al. (2000) pointed out total management involvement empowers employees in regard to IT related decisions. This sharing of knowledge may be the key to sustainable competitive advantage because it leads to more focused IT strategies.

Hunt (1999) noted that organizational competitiveness is dependent upon the use of organizational learning processes that can uncover dispersed knowledge capable of rendering superior organizational performance. Reich and Benbasat (1996) considered strategic IT alignment is an organizational learning process that combines business and IT knowledge in order to support business objectives; it can positively affect organizational profitability by creating superior strategies that achieve a competitive advantage. Alignment also includes the set of explicit outcomes contained in the business plan and IT plan. Organizations cannot learn without continuous learning by its employees. Individual learning is not organizational learning until it is converted into organizational learning. The conversion process can take place through individual and organizational memory (Nevis, 1995). The results of individual learning are captured in individuals' memory; individual learning becomes organizational learning only when individual memory becomes part of organizational memory (Cohen, 1991). In the last few years several theoretical models of organizational learning have been developed from the perspective of diverse disciplines.

In the current organizational learning thinking, two contrasting perspectives for organizational learning collide. In the acquisition perspective, the mind is viewed as being a container, knowledge as a substance and learning as the transfer and addition of substance to mind, while the participation perspective derives from studies of learning in which no teaching was observed and understand learning as participation in communities of practice (Lave & Wenger, 1991). According to Hudaib (2009) the organization should changes in the way the staff members think, act and enhance the employees' freedom of expressing their ideas and themselves without limitations; also Support the top management to forecast the future vision to solve day-to-day problems. Hui Wu&Fang (2010) found that organization process focus on improvements in project performance and organizational learning. In additional, the level of organizational learning significantly affects the degree of project performance, also organization process focus has an indirect effect on project performance as mediated through organizational learning and also has a direct effect on project performance in addition to increases in organizational learning led to higher project performance.

Ramirez, etc., (2011) developed a conceptual model to examine the relationship between knowledge creation process and organizational learning, and shows how both intangibles affect firm performance. The results show that four modes of the conversion of knowledge affect directly and indirectly organizational learning that means the greater presence of the processes of knowledge creation in the organization, i.e. organizational learning facilitates efforts to improve organizational performance. Thus, knowledge creation processes are related with organizational learning playing the key role improving organizational performance. The organization should enhance learning disciplines, and at the same time extend the benefits of learning facilitators. Human resources are considered the most critical factor in achieving sustainable competitive advantage, companies must learn how to manage performance, and develop strategies to improve employees' skills, competencies and knowledge (al-qutop,futa,&ma'ani,2011).

Hypotheses

Al nsour (2010) recommend that commitment of the organization to promote the process of continuous interaction with the beneficiary groups and to achieve satisfaction by introducing the draft programs and improve the operations of the ministry of

higher education and scientific research of Jordan through adoption TQM and reengineering business processes; and the competition based on operations. Senge (1994) proposed the five learning disciplines as the core of learning organization work for lifelong programs of study and practice. These five disciplines are:

1. Personal mastery: learning to expand personal capacity to create the results we most desire, and creating an organizational environment, which encourages all its members to develop themselves toward the goals and purpose they choose. In this discipline, it is necessary to take a series of practices and principles as the way to begin developing a sense of personal mastery. People need to build personal vision, holding creative tension, understanding the structural conflict, the power of your powerlessness, commitment to the truth, and using the subconscious as possible (Senge, 1994). This leads us to the following hypotheses:

H1. Persona mastery"PM" is associated with performance.

2. Mental models: reflecting upon, continually clarifying, and improving our internal pictures of the world, and seeing how they shape our actions and decisions (Senge, 1994). The skills of this discipline include planning as learning and internal boards, reflection and inquiry skills. The practice of recognizing leaps of abstraction, excising left-hand column, balancing inquiry and advocacy, recognizing the gap between espoused theories (what we say) and theories in use (the theories that lay behind our actions) are the base for practicing reflection and inquiry skills. This leads us to the following hypotheses:

H2. Mental model"MM" is associated with performance.

3. Shared vision: building a sense of commitment in a group, by developing shared images of the future we seek to create, and the principles and guiding practices by which we hope to get there (Senge, 1994). The skills of this discipline included encouraging members to build personal vision, create shared visions from personal visions, and spreading visions: not just enrollment, or compliance, it should have commitment from members Senge adopted Kiefer's words "enrollment is the process, of becoming part of something by choice". Committed describes a state of being not only enrolled but feeling fully responsible for making the vision happen (Senge, 1990). Almost 90 percent of today's organizations are not commitment, but compliance; if communities of servant leaders, not hero leader, can build learning organizations, can convince the members to have commitment to the organization (Kofman and Senge, 1993). This leads us to the following hypotheses:

H3. Shared vision"SV" is associated with performance.

4. Team learning: Transforming conversational and collective thinking skills, so that groups of people can reliably develop intelligence and ability greater than the sum of individual members' talents (Senge, 1994). Team learning is a collective discipline and involves mastering the practices of dialogue and discussion. In a discussion, different views are presented and defended, and this may provide a useful analysis of the whole situation. In dialogue, different views are presented as a means toward discovering a new view. Team learning also involves learning how to deal creatively with the powerful forces opposing productive dialogue and discussion in working teams (Senge, 1994). An organization should appropriately deal with conflict and defensive routines. According to Senge's experience, one of the most reliable indicators of a team that is continually learning is the visible conflict of ideas. In great teams conflict becomes productive (Senge, 1994). Senge (1990) stated that "defensive routines" as "habitual ways of interacting that protect us and others from threat or embarrassment, but which also prevent us from learning". Defensive reasoning protects us from learning about the validity of our reasoning. This leads us to the following hypotheses:

H4. Team learning"TL" is associated with performance.

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5. Systems thinking: A way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behavior of systems. This discipline helps us see how to change systems more effectively and to act more in tune with the larger processes of the natural and economic world (Senge, 1994). This leads us to the following hypotheses:

H1. Systems thinking"SM" is associated with performance.

Performance of the public sector

Performance development is a tool for rewarding, encouraging, supporting and developing all employees. Organizations use many different terms to describe performance development, including performance management and performance appraisal. Performance development is an opportunity to recognize the employees' achievements and developments and to make a plan together to develop the competencies and capabilities they require for their role now and in the future. In Jordan the government adapts the national agenda in order to schedule the government program, also to be able to follow up and measure its implementation and achievement. In order to enhance the government performance the public sector has to rely on some management tools that approved its effect on developing the performance on these tools is the organizational learning. The above hypotheses are summarized in figure 1.

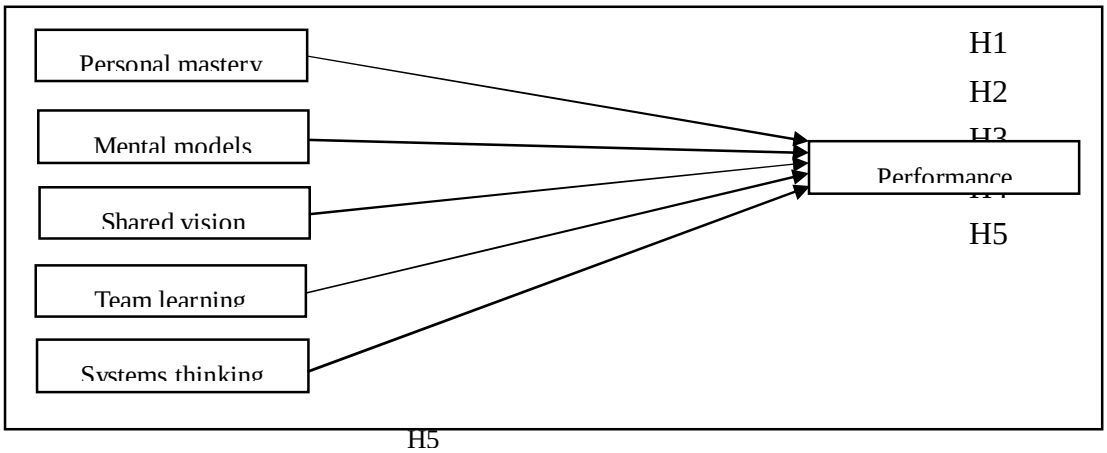

Figure 1. The research model

Case study: Ministry of planning and international cooperation (MOPIC)

MOPIC vision as a pilot ministry is envisions sustainable socioeconomic development, through the setting of effective policies, identification of sectorial priorities, implementation of local development programs, and strengthening international cooperation. The national objectives of MOPIC are:

1. Development of a flourishing national economy that is open to regional and international markets.
2. Promotion of good governance so that central and local government bodies become financially stable, transparent, and accountable.
3. Ensuring that Jordan is safe and an appropriate place to live in and work for current and future generations.
4. Provision of appropriate infrastructure and efficient facilities with high return.

Whereas the institutional objectives of the ministry of MOPIC are:

1. Maximize the benefits from foreign assistance (grants, soft loans, and technical assistance) to finance developmental programs and projects.
2. Develop the appropriate methodologies and planning tools to prepare, follow-up, and assess developmental programs and projects.
3. Enhance the competitiveness of the national economy.
4. Support local development efforts.
5. Strengthen and intensify relations with partners and stakeholders.
6. Improve individual efficiency and development of institutional performance.

Research Methodology and Measurement of the Model Variables

With satisfactory content validity established, the measurement items were further tested for consistency, ease of understanding, and sequential appropriateness by a series of in-depth literature and interviews with MOPIC employees. The reliability of a measurement procedure is the stability or consistency of the measurement. If the same individuals are measured under the same conditions, a reliable measurement procedure will produce identical measurements. Although reliability and validity are both criteria for evaluating the quality of a measurement procedure, these two factors are partially related and partially independent. A measure cannot be valid unless it is reliable, but a measure can be reliable without being valid. The important properties for measurement to be reliable and valid include content validity, internal consistency of operationalisation (unidimensionality and reliability), construct validity (discriminant and convergent). To answer the main questions of this quantitative-analytical research, a questionnaire was prepared to investigate the MOPIC employees' adoption the effect of the organizational learning at their performance. A questionnaire was designed based literature review and pilot tested before distribution to MOPIC employees, the study population consisted of all the employees at ministry of planning and international cooperation, total of 278 employees from all levels of the ministry and from all departments comprised the purposive sample of the study. After eliminating the questionnaires with which the data are incomplete or missing, the total effective sample size is reduced to 245, which satisfies the recommendation made by literature.

A cover letter and general definitions explained the purpose of the survey and its perceived importance embedded in the questionnaire. Before testing the entire model using structural equation modeling, factor analysis conducted to assess the validity of measurement model, the main concern in this part is "Do items really measure the specified constructs?" statistical package SPSS 19.0 was used to run a series of data reduction tests, data were subjected to factor analysis technique using principal axis factoring extraction method combined with varimax rotation. In this study, factor analysis was used to analyze the relationships among variables. The basic idea of factor analysis is to combine several variables into a smaller set of independent variables without losing the essential information from the original dataset. When factor analysis is conducted, the first step is to examine whether the dataset is appropriate for factoring. The following steps can be undertaken. Examine the correlation matrix: High correlations indicate that variables can be grouped into homogenous sets of variables, and they are thus appropriate for factor analysis. Examine Kaiser– Meyer– Olkin measure of overall sampling adequacy (KMO) for each variable: The KMO measure provides a means to assess the extent, to which the indicators of a construct belong together, i.e. a measure of the homogeneity of variables.

Before indicating the factors influencing on MOPIC performance by using factor analyzing (a) significance level of 0.000 were obtained using Bartlett's sphericity test, which suggests that the intercorrelation matrix contains sufficient common variance to

make factor analysis worthwhile, (b) Kaiser–Meyer–Olkin measure of sampling adequacy was ranged from 0.63(system thinking) to 0.77(personal mastery) in the acceptable range (well above 0.60). Therefore the assumptions for carrying out factor analysis are met. The sample data of 200 responses was examined using factor analysis with principal components as the extraction technique and varimax as the rotation method. Nine factors were extracted in the unrotated factor solution with eigenvalues over 1. These five factors explain 71% of the variance. However, interpretation of the factors that are not subject to rotation is rarely significant. After analyzing 5 factors, 5 factors having a factor loading of 0.50. These five factors explain 71% of the variance ranged from 60.0 (system thinking) to72.5 (personal mastery), which is an acceptable percentage. The compromise is worthwhile because the factor solution is easier to interpret. A varimax rotation was applied which converged in 9 iterations. According to the accepted guidelines for identifying significant factor loadings, 0.30 was accepted as the cut-off point for interpretation purposes. We considering the factors both loadings and cross-loadings to establish discriminant validity with the highest loadings were first taken into account when naming the factors. Factor loadings are ranged from 0.62 to 0.82 and these are greater than the recommended level of 0. 5 which are based on 155 retained questionnaire.

These results confirm that each of these construct is unidimensional, distinct, and that all items used to operationalize a particular construct is loaded into a single factor. Reliability was evaluated by assessing the internal consistency of the items representing each factor using Cronbach's a. The reliabilities of factors are shown in table 1. Cronbach's values were high above the acceptable threshold (70.0), ranging from 0.69 (personal mastery) to 0.92(shared vision).Table 1 summarized each factor loadings, variance and Cronbach's.

Table 1 Results of factor analysis

Items frequency	**Factor loadings**	**Variance explained (%)**	**Cronbach's a**	**KMO**
Personal mastery		**72.5**	**0.69**	**0.77**
MOPIC always works on creating and Acquiring new knowledge to improve the performance	0.81			
Acquiring new knowledge improving my work	0.77			
MOPIC encourage and reward the self-directing learning	0.70			
To improving my performance Identifying my needed skills for future work tasks is important	0.81			
Mental model		**64.1**	**0.74**	**0.69**
MOPIC employees are allowed to questions current practices and strategies	0.62			
Innovation and creative ideas are encouraged to improve the performance	0.81			
There is a willingness to change the old patterns	0.87			
Shared vision		**61.9**	**0.92**	**0.75**
MOPIC vision, and purposes are clear, flexible communicable and attainable	0.76			
Employees are enabled to participate in strategic management process to improve the performance	0.76			

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Employees have common future trends and vision	0.80			
Team learning		**72**	**0.80**	**0.71**
At MOPIC there is across functional learning team to improve the performance	0.77			
All team members shared responsibility and are treated equally	0.69			
Teams revise their thinking as a result of group discussions	0.74			
Teams are recognized and rewarded for their achievements as a team/group	0.73			
Teams are confident that MOPIC will act on their recommendations				
MOPIC employees cooperate and help each other to learn	0.82			
System thinking		**60.0**	**0.77**	**0.63**
MOPIC considered to be one whole system, consists of several integrated subsystems	0.85			
Employees recognize the importance of the complementary performance of their departments				
MOPIC is perceived as one part of a larger economic and social system	0.79			

*Extraction Method: Principal Component Analysis, **Rotation Method: Varimax with Kaiser Normalization.

The methodology used in the elaboration of the measurement instrument has enabled to take into account a wide revision of the literature and the opinion of experts to synthesize the set of indicators that form the measurement instrument since the model contains five variables. To validate measurement model, three types of validity were assessed: content validity, convergent validity, and discriminant validity. Content validity was established by ensuring consistency between the measurement items and the extant literature. This was done by interviewing senior practitioners and pilot-testing the instrument. Convergent validity assessed by evaluating constructs validity of measurement scales, that's mean measure confirmatory factory analysis (CFA).

Considering the factors both loadings and cross-loadings establish to measure discriminant validity with the highest loadings which ranged from 0.62 to 0.82 and these are greater than the recommended level of 0. 5, which is based on 155 samples and 0.05 significant level. Although many studies used 0.5 as the threshold reliability of the measures, 0.7 is a recommended value for a reliable construct. In addition, the weights and loadings of the measures in research model were accepted. As expected, all measures are significant on their path loadings at the level of 0.01.

Results and discussion:

The overall result as the results indicated very good, taking in consideration the fact that organization learning is not new concept in many developing countries, this result might be logical. Factor loading, KMO, Cronbach's a, and average variance explained for responses on each of the155 questionnaire. We

found that the personal mastery was the most important factor at affecting the performance of the public sector. It has been found that acquiring new knowledge improving the employees work in addition to MOPIC encouragement and rewarding the self-directing learning. System thinking ranked the last one. So the respondents consider the team learning and mental model have a weak affect at the performance in comparison with personal mastery, system thinking and shared vision.

Conclusions:

The organizational learning as an important concept it should be adapted by the public sector, especially here in Jordan .according to the research results the organizational learning affect the performance of the public sector and play an important role at enhancing the performance of the employees. So considering the research results it is recommended that the public sector has to adapt the organizational learning concept in order to enhance the organizational performance.

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