The Effect of Intellectual Capital on the Performance of Pharmaceutical Manufacturing Organizations in Jordan

أثرُ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّة

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The Authorization

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Examination Committee's Decision

This dissertation, which discusses The Effect of Intellectual Capital on the Performance of Pharmaceutical Manufacturing Organizations in Jordan, has been defended and approved on 12 of March 2007.

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قرار لجنة المناقشة

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List of Acronyms

ALA	Alliances, Licensing and Agreements
BP	Business Performance
BSC	Balance Score Card
E&E	Experience and Expertise
HC	Human Capital
I&C	Innovation and Creation
IAM	Intangible Asset Monitor
IC	Intellectual Capital
ICM	Intellectual Capital Management
IPRs	Intellectual Property Rights
JPM	Jordanian Pharmaceutical Manufacturing Organizations
K.PSC	Knowledge about Partners, Suppliers and Customers
L&E	Learning and Education
PLS	Partial Least Squares
R&D	Research and Development
RC	Relational Capital
R.PSC	Relations with Partners, Suppliers and Customers
S&P	Systems and Programs
SC	Structural Capital

Table of Contents

List of Tables:

List o Figures

List of Models

List of Appendices

The Effect of Intellectual Capital on the Performance of Pharmaceutical Manufacturing Organizations in Jordan

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Abstract

Purpose: The purpose of the study is to investigate the influence of Intellectual Capital (IC) on Jordanian Pharmaceutical Manufacturing (JPM) Organizations' Business Performance (BP), through examining the managers' perceptions regarding significance and potential use of IC indicators to leverage JPM Organizations' BP.

Design/Methodology/Approach: The study was considered as a causality study, it investigated the effect of independent variables: human capital (HC), structural capital (SC) and relational capital (RC) on dependent variable i.e. JPM Organizations' BP, and examined each sub-variable of the independent variables. The study surveyed executives, top and middle managers working at the 15 JPM Organizations. To approach the aim of the study, practical data were used in the empirical analysis collected from 132 managers out of 200 managers of the mentioned organizations during the period from May to July 2007, by means of a questionnaire. The questionnaire was developed and refined through experts' interviews and the panel of judges committee. Statistical techniques such as descriptive statistics, t-test,

ANOVA test, correlation, multiple regressions, stepwise regression, sequential regression, partial least squares (PLS) and path analysis were employed. To confirm the suitability of data collection instrument, a Kolmogorov-Smirnov (K-S) test, Cronbach's Alpha and factor analysis were used.

Findings/Results/Conclusions: The results of the study indicated a positive significant relationship between IC and JMP organizations' BP. Through having a stronger IC within JPM Organizations, the managers can manage and leverage the present IC to achieve further performance improvement in the future. The results also indicated that the managers in JPM Organizations were almost similar in their preference of the RC and HC indicators over SC indicators. Therefore, it seems that the JPM Organizations place a heavy emphasis on the significance of RC and HC indicators over SC indicators. Such results suggest that there is a need to adopt a more comprehensive approach to manage all the three types of IC together. However, the RC indicators are the most important indicators to distinguish the organizations from one another, followed by HC, while still they have a lot of work to improve SC. Moreover, findings indicated that the relationships between the IC performance and productivity, profitability and market valuation are informative but varied. Findings suggest that the JPM Organizations' IC performance can clearly explain productivity and profitability more than market valuation. Furthermore, empirical results indicated that there are strong inter-relationships and interactions among the three components of IC and among the nine IC sub-variables with each other.

Finally, the results of HC indicated that the respondents believed that “learning & education” and “innovation & creation” sub-variables positively and directly affect the JPM Organizations’ BP, while the “experience & expertise” sub-variable does not positively and directly affect the JPM Organizations’ BP. The results of SC indicated that the respondents believed that “systems & programs” and “research & development” sub-variables positively and directly affect the JPM Organizations’ BP, while the “intellectual property rights” sub-variable does not affect the JPM Organizations’ BP. Moreover, RC results indicated that the respondents believed that “relations with partners, suppliers and customers” and “knowledge about partners, suppliers and customers” sub-variables positively and directly affect the JPM Organizations’ BP, while “alliances, licensing and agreements” sub-variable does not affect the JPM Organizations’ BP.

Research Limitations/Recommendations: The use of a single industry study design limits its generalisability to other industries. The data is also limited to Jordanian organizations; therefore, generalizing results of a Jordanian setting to other countries may be questionable. Extending the analyses to other settings represent future research opportunities, which can be done by the following ways: Further testing with larger samples within same industry is important, and including other industries will help mitigate the issue of generalizing conclusions on other organizations and industries. Moreover, further empirical researches involving data collection over diverse countries especially Arab countries are needed.

Contributions/Practical Implications: The research makes significant theoretical and empirical contributions to literature regarding influence of IC on the organizations' BP. The research results might help both academics and practitioners to be more ready to understand the components of IC and provide insight into developing and increasing them within their organizations. IC is an important source of organizations' wealth and therefore it should be taken into serious consideration when formulating the JPM Organizations' strategy. This strategy formulation process can be enhanced by fully integrating IC into management practices. JPM Organizations should coordinate different perspectives of IC to improve JPM Organizations' BP and should assign scales for each of the three components of IC. Finally, the data suggest that a similar set of IC indicators could be developed for other organizations and industries whether government, public or private, profitable or non-profitable organizations.

Expected Value: The current research may be considered as initiative study that highlights the effect of IC on JPM Organizations' BP in Jordan. It could be also initiative study that investigates the relation between IC and Pharmaceutical Organizations' BP in the Arab world. Moreover, it might be an initiative study that uses partial least square (PLS) method in the management field, in Jordan and may be in Arab countries. Finally, it could be an initiative study that sub-divides IC variables into sub-variables and focuses on the role of each sub-variable on organizations' BP. The empirical results of this study built on the previous researches on the relationship between IC and organizations' BP.

This study also extends prior research's viewpoint about the linear relationship between IC and organizations' BP with empirical evidence. The results can provide the reference for further research about the relationship between IC and BP.

Key Words: Intellectual Capital (IC), Human Capital (HC), Structural Capital (SC), Relational Capital (RC), Jordanian Pharmaceutical Manufacturing (JPM) Organizations, Business Performance (BP).

أثرُ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّة

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الأُسْتَاذ الدُّكْتُور شَوْقِي نَاجِي جَوَاد

المُلَخَّص

هَدَفُ الدِّرَاسَةِ: غَرَضُ هَذِهِ الدِّرَاسَةِ تَقَصِّي أَثَرَ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ، عَنْ طَرِيقِ دِرَاسَةِ تَصَوُّرَاتِ المُدِيرِينَ فِي هَذِهِ المُنَظَّمَات بِالنِّسْبَةِ لِلفَائِدَةِ مِنْ مُؤَشِّرَاتِ رَأْسِ المَالِ الفِكْرِيِّ وَاحْتِمَالِ اسْتِخْدَامِهَا لِتَحْسِينِ أَدَاءِ مُنَظَّمَاتِ الأَعْمَالِ .

التَّصْمِيم/المَنْهَجِيَّة/الإِجْرَاءَات: تُعْتَبَرُ هَذِهِ الدِّرَاسَةُ دِرَاسَةً سَبَبِيَّةً حَيْثُ أَنَّهَا دَرَسَتْ تَأْثِيرَ المُتَغَيِّرَاتِ المُسْتَقِلَّةِ وَهِيَ: رَأْسُ أَلمَالِ البَشَرِيّ وَرَأْسُ المَالِ الهَيْكَلِيّ ورَأْسُ المَالِ العَلاقَاتِيّ (الزَّبَائِنِيّ) عَلَى المُتَغَيِّرِ التَابِعْ وَهُوَ أَدَاءُ مُنَظَّمَاتِ الأَعْمَالِ. وَشَمِلَتْ الدِّرَاسَةُ المُدَرَاءَ التَّنْفِيذِيِّينَ وَالإِدَارَةَ العُلْيَا وَالوُسْطَي العَامِلِينَ فِي مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ الخَمْسَةَ عَشَر فِي الأُرْدُنِّ.

وَمِنَ النَّاحِيَةِ العَمَلِيَّةِ تَتَأَلَّفُ البَيَانَاتُ المُسْتَخْدَمَةُ فِي هَذِهِ الدِّرَاسَةِ مِنَ المَعْلُومَاتِ التِي تَمَّ جَمْعُهَا مِنْ 132 مُدِيرٍ فِي هَذِهِ المُنَظَّمَاتِ مِنْ أَصْلِ حَوالِيْ 200 مديرٍ خِلالَ الفَتْرَةِ مِنْ أَيَّار إِلَى تَمُّوز من عَام 2007م، وَتُعْتَبَرُ الاسْتِبَانَةُ أَهَمَّ وَسِيلَةٍ اسْتُخْدِمَتْ لِجَمْعِ البَيَانَاتِ فِي هَذَا البَحْثِ حَيْثُ إِنَّهَا وُضِعَتْ وَدُقِّقَتْ مِنْ خِلالِ مُقَابَلاتِ الخُبَرَاءِ وَلَجْنَةِ التَّحْكِيمِ. كَمَا اسْتَخْدَمَ البَاحِثُ عَدَدًا مِنَ التِّقْنِيَاتِ الإِحْصَائِيَّةِ مِثْلَ الإِحْصَاءِ الوَصْفِيِّ وَاخْتِبَارَاتِ T-TEST وَANOVA وَالارْتِبَاطِ وَتَحْلِيلِ الانْحِدَارِ المُتَعَدِّدِ وَالانْحِدَارِ التَّتَابُعِيّ وَطَرِيقَةِ المُرَبَّعَاتِ الصُّغْرَى (PLS) وَتَحْلِيلِ المَسَارِ مِنْ أَجْلِ فَحْصِ العَلاقَةِ المُتَبَادِلَةِ بَيْنَ عَنَاصِرِ رَأْسِ المَالِ الفِكْرِيِّ الثَّلاثِ: رَأْسُ المَالِ البَشَرِيّ وَرَأْسُ المَالِ الهَيْكَلِيّ وَرَأْسُ المَالِ العَلاقَاتِيّ وَعَلاقَتِهِمَا مَعَ أَدَاءِ مُنَظَّمَاتِ الأَعْمَالِ. وَلِلتَّأَكُّدِ مِنْ مُلاءَمَةِ الاسْتِبَانَةِ كَوَسِيلَةٍ لِجَمْعِ المَعْلُومَاتِ اسْتَخْدَمَ البَحْثُ كُولمُوجْرُوف سمِيرْنُوف Kolmogorov-Smirnov (K-S) وكرُونْبَاخ أَلْفَا Cronbach's Alpha وَاخْتِبَارَ التَّحْلِيلِ العَامِلِيّ Factor Analysis.

النَّتَائِج: تُشِيرُ نَتَائِجُ الدِّرَاسَةِ إِلَى وُجُودِ عَلاقَةٍ مُبَاشِرَةٍ وَايجَابِيَّةٍ بَيْنَ رَأْسِ المَالِ الفِكْرِيِّ وأَدَاءِ مُنَظَّمَاتِ الأَعْمَالِ، فَكُلَّمَا زَادَ فَهْمُ رَأْسِ المَالِ الفِكْرِيِّ دَاخِلَ المُنَظَّمَهِ تَمَّكَّنَ المُدِيرُ مِنْ إِدَارَتِهِ وَرفَعَهُ مِنْ أَجْلِ تَحْقِيقِ المَزِيدِ مِنْ تَحْسِينِ الأَدَاءِ فِي المُسْتَقْبَلِ. وَتُشِيرُ النَّتَائِجُ كَذَلِكَ إِلَى أَنَّ تَصَوُّرَاتِ المُدِيرِينَ فِي مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ تَكَادُ تَكُونُ مُتَمَاثِلَةً فِي تَفْضِيلِهِمْ لارْتِبَاطِ العَلاقَةِ بَيْنَ رَأْسِ المَالِ البَشَرِيِّ ورَأْسِ المَالِ العَلاقَاتِيّ مَعَ أَدَاء مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ أَكْثَرَ مِنَ العَلاقَةِ بَيْنَ رَأْسِ المَالِ الهَيْكَلِيِّ مَعَ أَدَاءِ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ. وَلِذَلِكَ، يَبْدُو أَنَّ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّةِ تُرَكِّزُ عَلَى رَأْسِ المَالِ البَشَرِيِّ ورَأْسِ المَالِ العَلاقَاتِيّ بِغَضِّ النَّظَرِ عَنْ حَجْمِ أَوْ قِطَاعِ المُؤَسَّسَةِ أَكْثَرَ مِنْ تَرْكِيزِهِمْ عَلَى رَأْسِ المَالِ الهَيْكَلِيِّ. وَتُشير هَذِهِ النَّتِيجَةُ إِلى الحَاجَةِ لاعْتِمَادِ نَهْجٍ أَكْثَرَ شُمُولِيَّةٍ لإِدَارَةِ جَمِيعِ مُكَوِّنَاتِ رَأْسِ المَالِ الفِكْرِيِّ مَعًا. كَمَا تُشِيرُ النَّتَائِجُ أَيْضًا إِلَى أَنَّ المُدِيرِينَ فِي هَذِهِ المُنَظَّمَاتِ يَتَصَوَّرُنَ أَنَّ رَأْسَ المَالِ العَلاقَاتِيّ يُعْتَبَرُ فِي المَقَامِ الأَوَّلِ وَهُوَ الذِي يُمَيِّزُ المُنَظَّمَاتِ عَنْ بَعْضِهَا، يَلِيهِ رَأْسُ المَالِ البَشَرِيِّ، فِي حِينِ لا يَزَالُ لَدَيْهِمْ كَثِيرًا مِنَ العَمَلِ لِتَحْسِينِ رَأْسِ المَالِ الهَيْكَلِيِّ. وَتُشِيرُ النَّتَائِجُ إِلَى أَنَّ العَلاقَاتِ كَانَتْ مُتَنَوِّعَةً بَيْنَ تَصَوُّرَاتِ المُدِيرِينَ حَوْلَ أَدَاء رَأْسِ المَالِ الفِكْرِيِّ لِلمُنَظَّمَةِ مَعَ الإِنْتَاجِيَّةِ وَالرِّبْحِيَّةِ وَالقِيمَةِ السُّوقِيَّةِ، فَيَسُودُ اعْتِقَادٌ عِنْدَ كَثِيرِينَ أَنَّ أَدَاءَ رَأْسِ المَالِ الفِكْرِيِّ لِلمُنَظَّمَةِ يُمْكِنُ أَنْ يُفَسِّرَ بِوُضُوحٍ الإِنْتَاجِيَّةِ وَالرِّبْحِيَّةِ أَكْثَرَ مِنَ القِيمَةِ السُّوقِيَّةِ. وَتُشِيرُ النَّتَائِجِ كَذَلِكَ إِلَى وُجُودِ عَلاقَاتٍ وَتَفَاعُلاتٍ وَارْتِبَاطَاتٍ قَوِيَّةٍ بَيْنَ المُكَوِّنَاتِ الثَّلاثَةِ الرَّئِيسِيَّةِ لِرَأْسِ المَالِ الفِكْرِيِّ.

مُحَدِّدَات البَحْثِ/ التَّوْصِيَاتِ: مِنَ المُحَدِّدَاتِ الوَارِدَةِ فِي هَذِهِ الدِّرَاسَة أَنَّ تَصْمِيمَ اسْتِخْدَامِ صِنَاعَةِ وَاحِدَةٍ فِي البَحْثِ يُقَلِّلُ مِنْ إِمْكَانِيَّةِ تَعْمِيمِهَا عَلَى صِنَاعَاتٍ أُخْرَى، كَمَا أَنَّ البَيَانَاتِ تَقْتَصِرُ عَلَى المُنَظَّمَاتِ الأُرْدُنِّيةِ لِذَلِكَ فَإِنَّ تَعْمِيمَ نَتَائِجِ هَذِهِ الدِّرَاسَةِ عَلَى البُلْدَانِ الأُخْرَى يَجِبُ أَنْ يَكُونَ بِحَذَرٍ. وَهَذِهِ المُحَدِّدَاتُ فِي التَّعْمِيمِ تُمَثِّلُ فُرَصًا لِلبُحُوثِ فِي المُسْتَقْبَلِ. وَيُمْكِنُ تَوْسِيعُ هَذِهِ الدِّرَاسَةِ مِنْ خِلالِ إِجْرَاءِ مَزِيدٍ مِنَ البُحُوثِ عَلَى عَيِّنَاتٍ أَكْبَرَ دَاخِلَ الصِّنَاعَةِ نَفْسِهَا، وَيُمْكِنُ كَذَلِكَ إِجْرَاءُ مَزِيدٍ مِنَ البُحُوثِ عَلَى مُنَظَّمَاتٍ أُخْرَى وَصِنَاعَاتٍ أُخْرَى (أَبْحَاثٍ مُشْتَرَكَةٍ بَيْنَ القِطَاعَاتِ) مِمَّا يُسَاعِدُ فِي زِيَادَةِ تَعْمِيمِ النَّتَائِجِ عَلَى مُنَظَّمَاتٍ وَصِنَاعَاتٍ أُخْرَى. وَكَذَلِكَ هُنَاكَ حَاجَةٌ لإِجْرَاءِ مَزِيدٍ مِنَ البُحُوثِ تَنْطَوِي عَلَى بَيَانَاتٍ فِي بُلْدَانٍ مُخْتَلِفَةٍ وَخَاصَّةً البُلْدَانِ العَرَبِيَّةِ. وَأَخِيرًا، فَإِنَّ البُحُوثَ فِي المُسْتَقْبَلِ يَنْبَغِي أَنْ تَسْعَى إِلَى بَحْثِ التَّفَاعُلِ بَيْنَ مُكَوِّنَاتِ رَأْسِ المَالِ الفِكْرِيِّ الأُخْرَى مِنْ أَجْلِ مَزِيدٍ مِنَ الفَهْمِ الشَّامِلِ لِتَأْثِيرِهَا عَلَى الأَدَاءِ. لذا تُوصِي هَذِهِ الدِّرَاسَةُ بِالقِيَامِ بِمَزِيدٍ مِنَ الأَبْحَاثِ حَوْلَ أَثَرِ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ المُنَظَّمَاتِ، كَمَا وَتُوصِي بِدَمْجِ مُؤَشِّرَاتِ رَأْسِ المَالِ الفِكْرِيِّ فِي اسْتِرَاتِيجِيَّاتِ المُنَظَّمَاتِ وَوَضْعِ مَقَايِيسٍ لِتَقْيِيمِ كُلٍّ مِنَ المُكَوِّنَاتِ الثَّلاثَةِ لِرَأْسِ المَالِ الفِكْرِيِّ لِتَحْسِينِ الأَدَاءِ.

التَّطْبِيقَاتُ العَمَلِيَّةُ: يُقَدِّمُ هَذَا البَحْثُ مُسَاهَمَاتٍ مُهِمَّةٍ فِي الأَدَبِ النَّظَرِيِّ وَالعَمَلِيِّ حَوْلَ أَثَرِ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ المُنَظَّمَاتِ. وَنَتَائِجُ البَحْثِ تُسَاعِدُ كُلٍّ مِنَ الأَكَّادِيمِيِّينَ وَالمُمَارِسِينَ لِيَكُونُوا أَكْثَرَ اسْتِعْدَادًا لِفَهْمِ مُكَوِّنَاتِ رَأْسِ المَالِ الفِكْرِيِّ وَيُعْطِي تَبْصِيرًا وَاضِحًا حَوْلَ كَيْفِيَّةِ تَنْمِيَةِ وَزِيَادَةِ رَأْسِ المَالِ الفِكْرِيِّ دَاخِلَ مُنَظَّمَاتِ الأَعْمَالِ. حَيْثُ يُعْتَبَرُ رَأْسُ المَالِ الفِكْرِيّ أَكْثَرَ أُصُولِ المنظمة قِيمَةً وَثَمَناً وَهُوَ المَصْدَرُ الرَّئِيسِيُّ لِثَرْوَةِ المُنَظَّمَاتِ، لِذَا يَنْبَغِي أَنْ يُؤْخَذَ بِعَيْنِ الاعْتِبَارِ وَبِجِدِّيَّةٍ عِنْدَ صِيَاغَةِ اسْتِرَاتِيجِيَّاتِ المُنَظَّمَاتِ، وَيَجِبُ أَنْ تُعَزَّزَ عَمَلِيَّةُ صِيَاغَةِ الاسْتِرَاتِيجِيَّاتِ بِالدَّمْجِ الكَامِلِ لِرَأْسِ المَالِ الفِكْرِيِّ فِي المُمَارَسَاتِ الإِدَارِيَّةِ. وَيَنْبَغِي أَنْ تُنَسِّقَ المُنَظَّمَاتُ بَيْنَ مُخْتَلَفِ مُكَوِّنَاتِ رَأْسِ المَالِ الفِكْرِيِّ لِتَحْسِينِ الأَدَاءِ. كَمَا يُنْصَحُ بِوَضْعِ مَقَايِيسَ لِتَقْيِيمِ كُلٍّ مِنَ المُكَوِّنَاتِ الثَّلاثَةِ لِرَأْسِ المَالِ الفِكْرِيِّ. وَأَخِيرًا، تُشِيرُ البَيَانَاتُ إِلَى أَنَّهُ يُمْكِنُ تَطْوِيرُ مَجْمُوعَةٍ مُمَاثِلَةٍ مِنْ مُؤَشِّرَاتِ رَأْسِ المَالِ الفِكْرِيِّ لاسْتِخْدَامِهَا فِي الصِّنَاعَاتِ وَالمُنَظَّمَاتِ الأُخْرَى سَوَاءٌ كَانَتْ مُنَظَّمَاتٍ حُكُومِيَّةً أَوْ عَامَّةً أَوْ خَاصَّةً، أَوْ كَانَتْ مُنَظَّمَاتٍ رِبْحِيَّةً أَوْ غَيْرَ ذَلِكَ.

القِيمَة المتوقعة: تُعْتَبَرُ هَذِهِ الدِّرَاسَةُ مُبَادَرَةً فِي دِرَاسَةِ تَأْثِيرِ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ مُنَظَّمَاتِ الأَعْمَالِ فِي الأُرْدُنِّ، وكذلك هِيّ مُبَادَرَةٌ فِي تَسْلِيطِ الضُّوءِ عَلَى تَأْثِيرِ رَأْسِ المَالِ الفِكْرِيِّ عَلَى أَدَاءِ مُنَظَّمَاتِ صِنَاعَةِ الأَدْوِيَةِ فِي العَالَمِ العَرَبِيِّ، وَهِيَ أيضًا مُبَادَرَةٌ باسْتِخْدامِ طَرِيقَةِ المُرَبَّعَاتِ الصُّغْرَى بِالتَّحْلِيلِ (PLS). كَمَا أَنَّهَا مُبَادَرَةٌ فِي تَقْسِيمِ مُتَغَيِّرَاتِ رَأْسِ المَالِ الفِكْرِيِّ الرَّئِيسِيَّةَ إِلى مُتَغَيِّرَاتٍ فِرْعِيَّةٍ تُرَكِّزُ عَلَى الدَّوْرِ الذِي يَقُومُ بِهِ كُلُّ فِرْعٍ عَلَى أَدَاءِ مُنَظَّمَاتِ الأَعْمَالِ. وَنَتَائِجُ هَذِهِ الدِّرَاسَةِ تَسِيرُ فِي الاتِّجَاهِ نَفْسِهِ مَعَ الأَبْحَاثِ السَّابِقَةِ حَوْلَ العَلاقَةِ بَيْنَ رَأْسِ المَالِ الفِكْرِيِّ وأَدَاءِ المُنَظَّمَاتِ، وَتُعَزِّزُ أَيْضًا نَتَائِجَ البُحُوثِ السَّابِقَةِ حَوْلَ العَلاقَةِ الخَطِّيَّةِ بَيْنَ رَأْسِ المَالِ الفِكْرِيِّ وأَدَاءِ المُنَظَّمَاتِ مَعَ الأَدِلَّةِ العَمَلِيَّةِ. لِذَا فَإِنَّ هَذِهِ النَّتَائِجَ يُمْكِنُ أَنْ تُوَفِّرَ المَرْجِعِيَّةَ لإِجْرَاءِ مَزِيدٍ مِنَ البُحُوثِ حَوْلَ العَلاقَةِ بَيْنَ رَأْسِ المَالِ الفِكْرِيِّ والأَدَاءِ فِي الأُرْدُنِّ وَالعَالَمِ العَرَبِيِّ.

الكَلِمَاتُ الأَسَاسِيَّةُ: رَأْسُ المَالِ الفِكْرِيِّ، وَرَأْسُ المَالِ البَشَرِيِّ، وَرَأْسُ المَالِ الهَيْكَلِيِّ، وَرَأْسُ المَالِ العَلاقَاتِيّ، ومُنَظَّمَاتُ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيَّة، وَأَدَاءُ الأَعْمَالِ.

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Chapter One

Introduction

This chapter deals with the background of the study, the problem statement and problem elements, and hypotheses to be tested. Followed by the conceptual and procedural definitions of key terms, purpose and objective of the research, the importance and scope of the research as well as research limitations.

1.1. Study Background:

In today's fast-growing business world, organizations are constantly evolving, and the role of the management is becoming more diverse than before. Most organizations have undergone radical changes, often prompted by economical pressure along with the twin demands of increased efficiency and productivity. The recent development of information technology has enabled tasks to be carried out in seconds rather than days. Bontis and Fitz-enz (2002, P.223) suggested that today's knowledge-based world consists of universal dynamic change and massive information bombardment. By the year 2010, the codified information base of the world is expected to double every 11 hours (Bontis 2000, P.5).

Vast social and economical changes in recent years have shifted the society from industrialism to post-industrialism, moreover, to a society based on information and communication technologies. These changes have affected all economic entities, including people, organizations, and technologies (Okkonen, 2004, P.1).

Facing the intensification of globalization competition, there is a widespread recognition that intellectual capital is a critical force that drives economical growth (Huang and Liu, 2005, P.237). In an aggressive competition, organizations are enforced to deliver better and better results, and managers are in the frontline (Heller and Hindle, 1998, P.8). Organizations will be involved in restlessness battles to attract and retain the human capital they need (Miller et. al. 1999, P.6).

Over the past decade, the fast growing realization of the importance of intellectual capital (intangible assets) as a whole has led to the need to manage organizations and measure their performance in different modern ways (Pike and Roos, 2000, P.2). Stewart (2003), in his article “Brain Power: How Intellectual Capital Is Becoming America's Most Valuable Asset, 1991”, was among the first researchers to use the term intellectual capital. The intellectual capital term had been used before, but what differentiated Stewart’s discussion was that intellectual capital was viewed at organizational level.

What can be measured, can be managed, and what one intends to manage, he has to measure (Roos et. al. 1997 P.21). Management at present deals with managing intangible resources (intellectual capital), and with managing physical resources (Roos, 2003, P.4). Intellectual capital assets can be defined as the knowledge, information, intellectual property, and experience that can be melted to create wealth

(Garcia-Meca and Martinez, 2005, P.305). While MacDougall and Hurst (2005, P.2) described intellectual capital as an intangible asset of the organization, that helps organizations to establish and maintain their competitive advantage.

Although intellectual capital has been increasingly receiving attention from managements in recent years, however, the debate about the specific concept makes intellectual capital not fully incorporated in financial reports as yet (Vergauwen and Alem, 2005, P.89).

The Pharmaceutical Manufacturing industry should be knowledge intensive and highly innovative industry in order to gain a competitive edge i.e. pharmaceutical organizations provide a mixture of more tangible forms of intellectual capital like patents and brand names and less tangible ones like employees' skills. Bollen et. al. (2005, P.1175) stated that the pharmaceutical industry is a knowledge intensive and highly innovative industry, accordingly a detailed study of intellectual capital, and its relation to pharmaceutical industry is needed.

In Jordan, the pharmaceutical industry is an important and crucial sector in the Jordanian economy. Economically speaking, this sector represents the second sector in terms of exports after the phosphate industry (see chapter four page 99). The difference between the phosphate industry and pharmaceutical industry is that Jordan sells phosphate as a raw material,

while in pharmaceutical industry the specialized organizations import the raw materials and process them into finished products to be exported. This process depends mostly on people's education, experience, and skills; i.e. intellectual capital.

Therefore, the current study aims at measuring the effect of intellectual capital elements on the JPM Organizations' business performance, and will be carried out on the JPM Organizations that are members in the Jordanian Association of Pharmaceutical Manufacturers (JAPM) that includes fifteen (15) members (companies). These organizations will be practically taken as the research population.

1.2. Problem Statement:

The researcher might be allowed to say that the problem of defining, measuring and managing the intellectual capital and the intellectual capital disclosure is not limited to one organization, industry, or country, but it is a worldwide problem (Tayles et. al. 2005). Additionally, according to related literature e.g. Bontis (2004, P.16) stated that "There has never been an intellectual capital development report published especially for the Arab region nor for any of the Arab countries individually" therefore, the current study could be an initiative study in the region that deals with such an issue.

Accordingly, the purpose of this research is to investigate the effect of intellectual capital elements on JPM Organizations' business performance. Previous studies have recommended carrying out such research in different countries, especially in Arab countries e.g. Bontis (2004).

1.3. Problem Elements:

Based on Stewart's (2003, P.67) and Bontis's questionnaire (1998, P.1) classification of intellectual capital, which consists of three elements: Human capital,

structural capital, and relational (customer) capital, the study problem can be perceived by having detailed and scientific answers to the following questions:

The main question: Is there a direct impact of intellectual capital on JPM Organizations' business performance?

This main question can be sub-divided into three questions according to intellectual capital elements as follows:

1. Is there a direct impact of the human capital element on JPM Organizations' business performance?

The human capital element question can be further sub-divided into three questions according to the human capital sub-variables as follows:

1.1 . Is there a direct impact of learning and education sub-variable on JPM Organizations' business performance?

1.2. Is there a direct impact of experience and expertise sub-variable on JPM Organizations' business performance?

1.3. Is there a direct impact of innovation and creation sub-variable on JPM Organizations' business performance?

2. Is there a direct impact of the structural capital element on JPM Organizations' business performance?

The structural capital element question can be further sub-divided into three questions according to structural capital sub-variables as follows:

2.1. Is there a direct impact of systems and programs sub-variable on JPM Organizations' business performance?

2.2. Is there a direct impact of research and development sub-variable on JPM Organizations' business performance?

2.3. Is there a direct impact of intellectual property rights sub-variable on JPM Organizations' business performance?

3. Is there a direct impact of the relational (customer) capital element on JPM Organizations' business performance?

The relational capital element question can be further sub-divided into three questions according to relational capital sub-variables as follows:

3.1. Is there a direct impact of alliances, licensing and agreements sub-variable on JPM Organizations' business performance?

3.2. Is there a direct impact of relations with partners, suppliers and customers' sub-variable on JPM Organizations' business performance?

3.3. Is there a direct impact of knowledge about partners, suppliers and customers' sub-variable on JPM Organizations' business performance?

1.4. Study Hypotheses:

Based on the above-mentioned questions about the problem statement and its elements, and according to the study model on page (45), the following hypotheses can be developed:

Main Hypothesis: Intellectual capital elements (variables) do not have a direct impact on JPM Organizations' business performance.

This main hypothesis can be sub-divided into three hypotheses according to the intellectual capital elements (variables) as follows:

First Hypothesis: The human capital element does not have a direct impact on JPM Organizations' business performance.

The human capital element hypothesis can be further sub-divided into three hypotheses according to human capital sub-variables as follows:

1.1. Learning and education sub-variable does not have a direct impact on JPM Organizations' business performance.

1.2. Experience and expertise sub-variable does not have a direct impact on JPM Organizations' business performance.

1.3. Innovation and creation sub-variable does not have a direct impact on JPM Organizations' business performance.

Second Hypothesis: The structural capital element does not have a direct impact on JPM Organization's business performance.

The structural capital element hypothesis can be further sub-divided into three hypotheses according to structural capital sub-variables as follows:

2.1. Systems and programs sub-variable does not have a direct impact on JPM Organization's business performance.

2.2. Research and development sub-variable does not have a direct impact on JPM Organization's business performance.

2.3. Intellectual property rights sub-variable does not have a direct impact on JPM Organization's business performance.

Third Hypothesis: The relational capital element does not have a direct impact on JPM Organizations' business performance.

The relational capital element hypothesis can be further sub-divided into three hypotheses according to relational capital sub-variables as follows:

3.1. Alliances, licensing and agreements sub-variable does not have a direct impact on JPM Organizations' business performance.

3.2. Relations with partners, suppliers and customers' sub-variable does not have a direct impact on JPM Organizations' business performance.

3.3. Knowledge about partners, suppliers and customers' sub-variable does not have a direct impact on JPM Organizations' business performance.

1.5. Conceptual and Procedural Definitions of Key Terms:

The following terms are used throughout the study:

Intellectual Capital (IC): According to Skandia (Swedish organization) company profile (2007): In 1991, Skandia had hired Leif Edvinsson, as the corporate world's first director of intellectual capital. Skandia annual report 1995 was the first worldwide annual report about intellectual capital. Skandia (1995, P.3) defined intellectual capital as the possession of knowledge, applied experience, organizational technology, customer's relationships, and professional skills that provide Skandia organization with a competitive edge in the market. On the same page, Skandia has classified intellectual capital into human capital and structural capital. Structural capital is divided into organizational capital and customer capital. Organizational capital in turn is divided into innovation capital and process capital. Skandia (1997, P.44) describes intellectual capital as the difference between a company's market value and its book value. Skandia (1998, P.6) states that the core of intellectual capital is made up of the talent pool of every individual. Skandia (2000, P.33) states that Skandia's competitiveness now and in the future is dependent on the intellectual capital it can attract, retain, optimize and develop.

Stewart (2003, P.67) defines intellectual capital as: The sum of everything everybody in the organization knows that gives it a competitive edge; intellectual capital is intangible; it is also defined as an intellectual material: knowledge, information, intellectual property and experience

that can be put into use to create wealth; intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher-valued asset; intellectual capital encompasses human capital, structural capital, and relational capital.

According to Bontis questionnaire (1998, P.1) intellectual capital has often been described as the difference between what an organization's market value is and the cost of replacing its assets. Therefore, this difference (often positive) can be described as "those things that we normally cannot put a price tag on" such as expertise, knowledge, and an organizational learning ability. While on page (2), he classifies intellectual capital into three components: 1) Human capital that can be described as the organization's collective capability to extract the best solutions from the knowledge of its individuals that is found in the minds of individuals; 2) Structural capital that can be thought of as the organization's organizational capabilities to meet market requirements or what is left after employees go home for the night; 3) Relational (customer) capital that refers to the organization's relationships e.g. with the partners, suppliers, and customers.

This research takes into account the definitions and the classifications of both Stewart and Bontis for research purpose, so in this research, intellectual capital will be classified into three components: human capital, structural capital, and relational (customer) capital.

Human Capital (HC): It represents the individual's knowledge; it is not owned by an organization and includes what is in the minds of the individuals. Human capital is defined, as the knowledge, skills, and experience that the employees take with them when they leave at evening, some of this knowledge is unique to the individual; some may be generic. It can be described as an organization's collective capability to extract the best solutions for customers from the knowledge base of its individuals. In this research, human capital will be measured through "education and learning", "experience and expertise" and "innovation and creation" sub-variables.

Structural (Organizational or External) Capital (SC): It represents organizational knowledge; it is owned by the organization. Structural capital is everything that is left behind when the human capital walks out the door at the end of the day. Structural capital is defined as the knowledge that stays within the organization. It comprises organizational routines, databases, infrastructures, systems, programs, procedures, intellectual property rights, and cultures. In this research, structural capital will be measured through "systems and programs", "research and development (R&D)", and "intellectual property rights (IPRs)" sub-variables that are implemented by organizations.

Relational (Customer) Capital (RC): It represents organizational level of knowledge and is (to a degree) owned (influenced) by an organization. Relational capital is defined as all resources linked to the external relationships of the organization, with customers, suppliers and partners.

In this research, relational capital will be measured through organizations' effort towards "strategic alliances, licensing and agreements"; "relationship with customers, suppliers and partners"; and "knowledge about customers, suppliers and partners" sub-variables.

Organizations' Business performance: It consists of three elements: Productivity, profitability and market valuation. **Productivity** means the relation between input and output of processes and transactions. **Profitability** means earning before interest and tax (EBIT). **Market valuation** means the value of the whole organization or stock value. In the current study, business performance will be measured through the following indicators: industry leadership, future outlook, overall response to competition, success rate in new product launches, overall business performance and success, employee productivity, process (transaction) productivity, sales growth, profit growth, company's market valuation (stock value).

1.6. Study Purpose and Objectives:

This study investigates the effect of intellectual capital management on the JPM Organizations' business performance (the organizations listed in the Jordanian Association of Pharmaceutical Manufacturers (JAPM), Appendix (4)) i.e. cause-affect perspective research.

For this purpose, the current study attempts to find the impact of intellectual capital elements

(human capital, structural capital and relational capital) on JPM Organizations' business performance. In relation to this purpose, the previous empirical researches showed that there are three research challenges: The first challenge is how to separate the intellectual capital elements indicators, because they are strongly inter-related with each other. The second challenge is to explore the relationship between each intellectual capital element and the organizations' business performance. Consequently, the third challenge is analyzing intellectual capital from an organizational point of view.

More specifically, this study intends to answer the following question: Is there a direct impact of intellectual capital elements on JPM Organization's business performance?

The main objective of this research is to provide sound recommendations about performance measurement within intellectual capital context by identifying and defining the main attributes of quality and productivity of intellectual capital, i.e. to point out critical factors of intellectual capital and find suitable ways for measurement and management in that context.

1.7. Study Importance and Scope:

The current study presents the necessary components of intellectual capital definitions. It partially focuses on managerial norms, and partially on social norms. A better understanding of the effect of intellectual capital elements on the JPM Organizations' business performance draws conclusions that can be beneficial not only for JPM Organizations but also to other organizations, institutions and policy makers.

The content also may be of an interest to academic studies related to the reporting and decision making concerning intellectual capital.

The current study might be considered as initiative that presents the effect of intellectual capital on JPM Organizations' business performance in Jordan, and it may be an initiative study that investigates the relationship between intellectual capital and Pharmaceutical Industry business performance in Arab countries. Moreover, it might be an initiative study that uses partial least square (PLS) method in the management field in Jordan. If this study is put to use in the near future, it could present an important cornerstone that facilitates cross-disciplinary dialogue and hopefully establishes a research field of intellectual capital in Jordan. This research is also an important one, in terms of the analysis of the situation of intellectual capital in Jordanian organizations, as well as in determining some of the relevant intellectual capital indicators used by those organizations.

This study takes into consideration the manageability of the so-called intellectual capital elements, i.e. how they can be managed by employing the framework of performance measurement. This study presents the problem at an organizational level, as it is the level of implementing strategies and management.

1.8. Research Limitations:

This study is specifically assigned to performance measurement within the intellectual capital context at the organizational level that should be studied in the light of the following limitations:

First, limitations to data access refer to the fact that data gathering through the questionnaires and annual reports is restricted to the period of these questionnaires and annual reports, which may limit the quality and quantity of the data collected. Second, this study presents a snapshot research that does not consider feedback effects. A longitudinal study to investigate the dynamic features of intellectual capital would provide further robust results. Third, the research findings are based on questionnaires and annual reports collected from fifteen organizations. Although it may have limited generalizablity, it stands in with obvious contrast with previous researchers' conclusions regarding the use of intellectual capital. Further empirical work is needed to test the degree to which the study findings can be generalized to other organizations or industries. Moreover, further testing with larger samples will help mitigate the issue of generalizing conclusions on other industries.

Fourth, the sample of this study was restricted to pharmaceutical industry; it focuses on one type of industry. To increase the generalizability of the research results, investigations of at least one more industry is recommended. Further testing might consider a cross-sectional group of participants from a wide variety of industries.

Fifth, the results are limited to Jordanian organizations. Generalizing results of a Jordanian setting to other countries may be questionable. Therefore, the results of this study may be carefully interpreted. Further empirical researches involving data collection over diverse countries are needed. Sixth

, lack of comparative studies in Jordan and other Arab countries. Some other comparative researches with other organizations (local, regional and international) are necessary in the future. Finally, measures may need to be refined. Although most variables used in this research have high measurement reliability and validity, some variables may have room for further instrument refinement.

The conceptual model of this study represents an integrated view on intellectual capital through business performance. It might be not advisable to use parts of the model independently due to the interrelatedness of the components of the model.

There is a need to analyze data of other organizations over a longer period in order to clearly prove the assumptions of the intellectual capital method. The significant differences between organizations and/or industries could be explored by further studies. It is also recommended to work out research that compares results with other developing countries' under similar assessment and measurement.

Chapter Two

Conceptual and Theoretical Framework

This chapter deals with the conceptual and theoretical framework of intellectual capital and business performance. It presents the process of intellectual capital development at different stages in logical flow. It starts with reviewing different definitions of intellectual capital at various stages, followed by reviewing different classifications of intellectual capital. Then, the component of intellectual capital part describes how different schools and authors classify and define intellectual capital elements, and then the chapter highlights the business performance indicators and measurements.

The "why measure intellectual capital" part highlights the reasons and justifies why the organization and the management need to measure and manage intellectual capital. The next part is about methods and models used to measure and manage intellectual capital at different stages, followed by the study model.

2.1. Definition of Intellectual Capital:

Unfortunately, although the concept of intellectual capital has been used for years, however, until now there is no clear cut definition for it, nor an agreement upon classification of its components. According to Pitkanen (2006, P.6) there is a lack of a homogenous view on how to define, classify and evaluate intellectual capital. Marr and Moustaghfir (2005, P.1114) stated that "the concept of intellectual capital is often ill-defined", and they said that "the fuzziness of intellectual capital as a construct does not seem to decrease". Moreover,

Marr and Chatzkel (2004, P.226) concluded that: “Intellectual capital as a concept is often poorly defined”. Finally Bontis (1999, P.11) adds that: “It is clear that the definition is very vague, and purposely so”.

Therefore, through the following section the researcher highlights the different difenitions of intellectual capital used by different authors:

Skandia (1998, P.4), described intellectual capital as “the difference between the organization’s market value and its book value”, and on page (6), Skandia stated that: “The core of intellectual capital is made up of the talent pool of every individual”. While on page (22), Skandia defined intellectual capital as “the sum of structural capital and human capital, indicating future earnings capability from a human perspective”.

Roos and Roos (1997, P.8) defined intellectual capital as the sum of the hidden assets of the organization not fully captured on the balance sheet, and thus included both what is in the heads of organizational members, and what is left in the organization when they leave.

Lev (2001, P.3) stated that intellectual capital is the non-physical sources of value, generated by innovation, unique organizational designs, or human resource practices. While Zambon (2002, P.12) described intellectual capital as the knowledge that can be converted into profits**.**

Bontis’s questionnaire (1998, P.1) described intellectual capital as the difference between what an organization’s market value is and the cost of replacing its assets.

Therefore, this difference can be described as those things that the organization normally cannot put a price tag on, such as; expertise, knowledge, and an organizational learning ability. Then Bontis et. al. (2004, P.32) defined intellectual capital as the stock of knowledge assets that provides value to the organization. It is made of human capital, structural capital, and customer capital.

Howerever, Stewart (2003, P.67-68) in his book "Intellectual Capital: The New Wealth of Organizations" defined intellectual capital as: The sum of everything, everybody in an organization knows that gives it a competitive edge; intellectual capital is intangible; intellectual material: knowledge, information, intellectual property and experience that can be put to use to create wealth; intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher valued asset; encompassing: human capital, structural (organizational) capital, and relational (customer) capital. At the end, Stewart elaborated and stated that "intellectual capital is something you can not touch, but it still makes you rich."

From the above stated definitions, the researcher may conclude that intellectual capital can be summarized as follows: 1) It is an organizational intangible asset; 2) It is knowledge with potential for value or knowledge that can be used to create value; 3) It consists of three components: Human, structural, and relational capital; and 4) The human capital is the core of intellectual capital.

2.2. Classification of Intellectual Capital:

As stated above there is no unified classification for intellectual capital, nor an agreement upon components of intellectual capital. The researcher, therefore, presented some different classifications of intellectual capital as they were introduced by different writers:

Skandia (1995, P.44) classified intellectual capital into human capital and structural capital. Structural capital is divided into organizational capital and customer capital. Organizational capital in turn is divided into innovation capital and process capital. While Roos & Roos (1997, P.8) classified intellectual capital as both what is in the heads of employees (human capital) and what is left in the organisation when people leave the organization (structural capital).

Sveiby (1998) in his article "The Intangible Assets Monitor Framework (IAM)" classified intellectual capital into three parts: Internal structure, external structure and individual competence. The combination of internal structure and individual competence can collectively be called the organization's knowledge capital.

Bontis's questionnaire (1998, P.1-2) divided intellectual capital into three elements: Human capital, structural capital, and customer capital. While Bontis (2001, P.282) divided intellectual capital into three components. Human capital: the tacit knowledge embedded in the minds of the employees. Structural capital: The organizational routines of the business. Relational capital: The knowledge embedded in the relationships established with the outside environment.

Moreover, Stewart (2003, P.75-78) divided intellectual capital into human, structural, and customer capital, and he defined human capital as “the source of innovation and renewal”, whereas structural capital pertains to what “packages human capital and permits it to be used again and again to create value”. Customer capital refers to “the value of an organization’s relationship with which it does business”.

In summary, most of the literature of intellectual capital classified intellectual capital into three elements: Human capital (individual competences), structural (organizational or internal) capital and relational (customer or external) capital. The current study adopts this classification.

2.3. Components of Intellectual Capital:

The following section discusses the different definitions for each intellectual capital element (human, structural and relational capital):

Human (Individual Competence) Capital:

Skandia (1998, P.22) defined human capital as the accumulated value of investments in the employee’s training and competence. Roos et. al. (2001, P.6) stated that human capital comprises the competence, skills, and intellectual agility of the individual employees.

Zambon (2002, P.13) described human capital as one of the largest and most important intangible assets in an organization. He added that human capital includes the collective knowledge, competency, experience, skills, talents, creativity and innovativeness of people within an organization.

Human capital is not owned by the organization, it is only rented for the period the employees spend in the organization.

Bontis's questionnaire (1998, P.1-2) described human capital as the organization's collective capability to extract the best solutions from the knowledge of its individuals. Bontis (1999, P.339) states that it is the combined intelligence, skills and expertise that give the organization its distinctive character. Bontis (2000, P.5) defined human capital as the combined knowledge, skill, innovativeness, and ability of the organization's employees to meet the task at hand. Then, he stated, "Human capital also includes the organization's values, culture, and philosophy". Bontis (2001, P.282) stated that: Human capital cannot be owned by the organization, because Bontis (2002, P.224) described human capital as the tacit knowledge embedded in the minds of the employees.

Bontis & Fitz-enz (2002, P.224) stated that human capital is a profit lever of the knowledge economy. Bontis (2004, P.20) defined human capital as the knowledge, education and competencies of individuals in realizing national tasks and goals. The human capital of a nation begins with the intellectual wealth of its citizens.

Stewart (2003, P.76) described human capital as "the capabilities of individuals required to provide solutions to customers", and on page (89), added that "human capital is dissipated; it needs to be collected and concentrated". Then on page (101), he elaborated and stated that "people can be rented, but not owned", while on page (107) Stewart defined human capital as "the sap flowing beneath the bark of a tree, producing innovation and growth".

In general, most writers agreed on the view that human capital can be summarized as follows: First, it represents individuals knowledge; second it is not owned by the organization, but it can be rented; third it is in the minds of individuals (individual property) e.g. knowledge, education, learning, skills, experience, expertise, creativity, innovativeness, and problem solving abilities of each individual in the organization; and finally, it goes with individual when he leaves the organization.

Structural (Organizational and/or Internal) Capital

Skandia (1998, P.23) defined structural capital as the value of what is left when employees have gone home. Skandia divided structural capital into innovation capital and process capital; it consists of databases, customer's lists, manuals, trademarks and organizational structures.

Bontis's questionnaire (1998, P.1-2) described structural capital as the organization's capabilities to meet market requirements. Bontis (1999, P.12) stated that structural capital is "everything that remains in the organization after 5 o'clock", and Bontis, (2000, P.5) elaborated that it is unlike human capital; structural capital can be owned and thereby traded. Bontis (2001, P.282) added that structural capital is the organizational routines of the business. Moreover Bontis & Fitz-enz (2002, P.225) stated that structural capital represents the codified knowledge bases that do not exist within the minds of employees. On the other hand, Stewart (2003, P.108) defined structural capital as knowledge that does not go home at night, and on page (109) he stated that structural capital belongs to the organization as a whole. It can be reproduced and shared.

However, Zambon (2002, P.13) was more clear when he stated that structural capital is what is left when the employees go home at night, and it is considered as the hard assets of the organization. Structural capital consists of the supporting resources and infrastructure of an organization.

Then, Zambon said “Unlike human capital, structural capital is an organization property and can be traded, reproduced and shared by within the organization”. Roos et. al. (2001, P.6) said that structural capital represents processes, systems, structures, brands, intellectual property and other intangibles that are owned by the organization but do not appear on its balance sheet. Roose (2003, P.17) added that structural capital is owned or controlled by the organization, while relationship capital is owned or controlled by the parties, such as partners, suppliers and customers.

Therefore, one might conclude that structural capital can be summarized as follows: Firstly, it represents organizational knowledge; secondly, it is owned by the organization; thirdly, it can be reproduced, shared and traded with other organizations; finally, it is everything that’s left behind when the human capital walks out at the end of the day, such as systems, programs, hardware, software, databases, work processes, business models, research and development work and intellectual property rights (patents, copyrights, trademarks and trade secrets).

Relational (Customer or External) Capital:

Roos & Roos (1997, P.16) described relationship capital as the most important and necessary factor for success, and Roos et. al. (2001, P.6) stated that relational capital represents all the valuable relationships with customers, suppliers, partners and other relevant stakeholders. While Roos (2003, P.17) argues that relational capital is owned and/or controlled by the other parties who might shape such relationship.

Skandia (1997, P.44) described customer capital as "the present value of customer relationships", while Skandia (1998, P.22) described customer capital as the value of the customer base, customer relationships and customer potential, that might spring at any time in the future.

Zambon (2002, P.14) through his work stated that relational capital comprises not only customer relations but also the organization's external relationships with its network of suppliers, as well as its network of strategic partners and stakeholders. He said that the value of such assets is primarily influenced by the organization's reputation.

In addition, Bontis questionnaire (1998, P.1-2) described relational (customer) capital as that which refers to organization's relationships, with the customers, suppliers, and partners. Bontis (1998, P.1) added that customer capital might refer to "the end-user's satisfaction and loyalty to the organization". However, Bontis (1998, P.67)

described customer capital as the “knowledge embedded in relationships external to the organization”, and on the same page he elaborated on the subject and indicated that relational capital represents “the potential an organization has due to ex-organization intangibles”.

Later on, Bontis (2001, P.282) defined relational capital as “the knowledge embedded in the relationships established with the outside environment”, and Bontis Fitz-enz (2002, P.225) stated that it is “the knowledge embedded in the organizational value chain”. However, Stewart (2003, P.77) defined customer capital as the value of organization relationships with the people with whom it does business.

To conclude, the researcher might state that relational capital can be summarized as: It represents organization level of knowledge (knowledge embedded in external relationships); and that it is an important and necessary factor for success; plus, it is influenced by the organization and other parties that play part in the relationship; and finally, it represents all the valuable relationships with customers, suppliers, strategic partners (alliances, licensing, and agreements) investors (stockholders), stakeholders and the community at large.

Business Performance Indicators and Measurements:

According to Sveiby (2004), there are four approaches for measuring intangibles (Appendix 14): Direct Intellectual Capital methods (DIC); Market Capitalization Methods (MCM); Return on Assets methods (ROA);

and Scorecard Methods (SC). Therefore, there are different business performance methods and indicators used to measure the organizations business performance such as: Cash flow measures (Khan, 2000); Black–Scholes (BS) model (Sudarsanam, et. al. 2003); Return on assets (ROA) (Zambon, 2003 and Mampane, 2005); Market to book values (Cornelis, 2000 and Abeysekera, 2006); Direct intellectual capital methods (DIC) (Fondo and Wright, 2004); Calculated intangible value (Luthy, 1998 and Ungerer, 2004); Total value creation (TVC) (Jelcic, 2007); Real options-based approach (Berg, 2003 and Zambon, 2002); Economic value added (EVA) (Westhuizen, 2005 and Westnes, 2005); Market value added (MVA) (Lev, 2000 and Starovic & Marr, 2003), Tobin's Q ratio (Belenzon, 2006, Lev, 2007 and Young, 2006); Intellectual capital services' (IC) index: (Berg, 2003 and Malhotra, 2003); Citation-weighted patents (Westhuizen, 2005 and Westnes, 2005); Technology Broker's IC audit (Bollen et. al., 2005, and Bontis, 2001); IC Multiplier (Berglund et. al., 2002); Human resource accounting (HRA) (Raimann et. al., 2003 and Roos, 2003); Sveiby's intangible asset monitor (IAM) (Zambon, 2003); Skandia's IC Navigator (Skandia, 2007 and Bontis, 2001), Balanced score card: (Arveson, 1998 and Mouritsen et. al., 2005).

Bontis's questionnaire (1998, P.5) used ten indicators to measure organizations business performance through measuring intellectual capital elements, these indicators are used in the current study: Industry leadership, future outlook, overall response to competition, success rate in new product launches,

overall business performance and success, employee productivity, process (transaction) productivity, sales growth, profit growth and organization's market valuation (stock value).

Later on, most academic researches and studies used Bontis's questionnaire (1998) to measure the effect of intellectual capital elements on organizations' business performance, to assess quality of intellectual capital disclosure, and even to examine the situation of intellectual capital. Chapter three "review of related literature" will highlight many researches and studies that used Bontis's questionnaire (1998). Some scholars (Ferer and Stainbank, 2003) divided indicators into three elements: Productivity, profitability and market valuation. Kujansivu and lonnqvist (2005) divided the indicators into two: productivity and profitability. While Haar and Sundelin (2000) and Berglund et. al. (2002) used market value indicators.

Through the current study, Bontis's questionnaire (1998) business performance indicators will be used**,** and the following terms and definitions will be considered to complete the current study: **Productivity** means the relation between input and output of processes and transactions. **Profitability** means earning before interest and tax (EBIT). **Market valuation** means the value of the whole organization or stock value.

2.4. Why Measure Intellectual Capital?

During last decade, intellectual capital measurement and management have become a very crucial topic for all organizations, and whatever the business they do. This topic will become even more important in future, because the traditional accounting methods are not suitable for today's business environment. Malhotra (2000, P.6) study concluded that: Measurement of organizational value in current business environment using traditional accounting methods is increasingly inadequate and often irrelevant to real value in today's economy.

The purpose behind measuring intellectual capital is to understand how managers in these organizations manage to create value (competitive advantage). Malhotra (2003, P.3) concluded that: The reasons for valuation and measurement of intellectual capital and knowledge assets include understanding where value lies in the organization and in the sectors of the national economy, and such measurement would help developing metrics for assessing success and growth of organizations and economies.

Through the following section the researcher highlights the reasons and the justifications why organizations need to measure and evaluate their intellectual capital as discussed by different researchers:

Zambon (2002) paper about "Accounting, Intangibles and Intellectual Capital: An Overview of the Issues and some Considerations"

concluded that there are many motives for management engaging in intellectual capital measurement. Measurement is undertaken both for internal purposes (strategic purposes) and for external signaling purposes (performance purposes). Management of interested organizations will learn from the process of measurement, and will get useful information. Measurement helps to improve strategic thinking, and help identifying intangible drivers of future value.

Marr et. al. (2003) work was about "Why do Organizations Measure their Intellectual Capital". After a systematic review of over 700 papers including both theoretical and empirical research. Marr et. al. (2003, P.443) identified five main reasons why organizations are seeking to measure intellectual capital: First, to help organizations formulate their strategy. Second, to assess strategy execution. Third, to assist in diversification and expansion decisions. Fourth, to be used as a basis for compensation. Finally, to communicate measures to external stakeholders.

Marr and Chatzkel (2004) research titled "Intellectual Capital at the Crossroads: Managing, Measuring, and Reporting of Intellectual Capital". After a systematic review of the literature, Marr and Chatzkel (2004) identified three main categories of reasons why organizations measure their intellectual capital and bring them together under the following broad headings: 1) Strategy; 2) Behavior; and 3) External validation. In addition, they said that measurement can be seen as an output reporting on past realities or as an input for future decision-making.

Hunter et. al. (2005) through their study under the title "Motivations for Measuring Intangible Capital" concluded and summarized why organizations would like to measure intellectual capital. They stated that the purpose of intellectual capital measurement is to maximize organization performance through: 1) Maximizing operating performance in generating revenues at the lowest cost; 2) Maximizing the sustainability of supplier and customer relations; and 3) Minimizing the cost of the capital contributed by shareholders and lenders.

From what has been discussed, one can conclude that the intellectual capital should be measured for internal and external purposes, such as: 1) To make informed decision and formulate effective strategies; 2) To assess strategy implementation; 3) To influence individual and organizational behavior; 3) To provide more accurate organization valuations; 4) It is an indicator for future productivity and profitability; 5) To leverage all intellectual capital elements to meet organization goals; 6) To be used as a basis for compensation and to incentivize the employee for value creation activities; 7) To maintain high state of innovation and creativity; 8) To increase annual alliances, licensing and agreements; 9) To enhance negotiating position; 10) For the purpose of divestiture, takeover, defense, diversification and expansion decisions; 11) To communicate measures to external stakeholders, and for external validation; 12)

To achieve maximum commercial value extraction by: Maximizing operating performance to generate revenues at the lowest cost; maximizing the benefit from supplier and customer relations; minimizing the cost of the shareholders and lenders capital.

The researcher also concluded that the business performance measurements (indicators) are used for: 1) Planning and decision-making: Information for planning and decision-making and matching plans with goals and objectives; 2) Monitoring: Measuring and recording actual performance; 3) Control: Identifying and attempting to bridge the gap between planned performance and actual performance; 4) Improvement: Identify critical factors and improvement opportunities; 5) Coordination and communication: Groups, teams, internal communication across processes and external communication with stakeholders; 6) Motivation: Align behavior and encourage development, rewards and incentive.

2.5. Intellectual Capital Measurement and Management Methods and Models:

After reviewing related literature, it has been found that not only the definition and classification of intellectual capital were not clear and unified, but measurements, methods and models were not unified as well. Scholars and practitioners have used different methods and models to measure and manage intellectual capital. Bontis et. al. (1999) in their work article “The Knowledge Toolbox: A Review of the Tools Available to Measure and Manage Intangible Resources” aimed at answering the question:

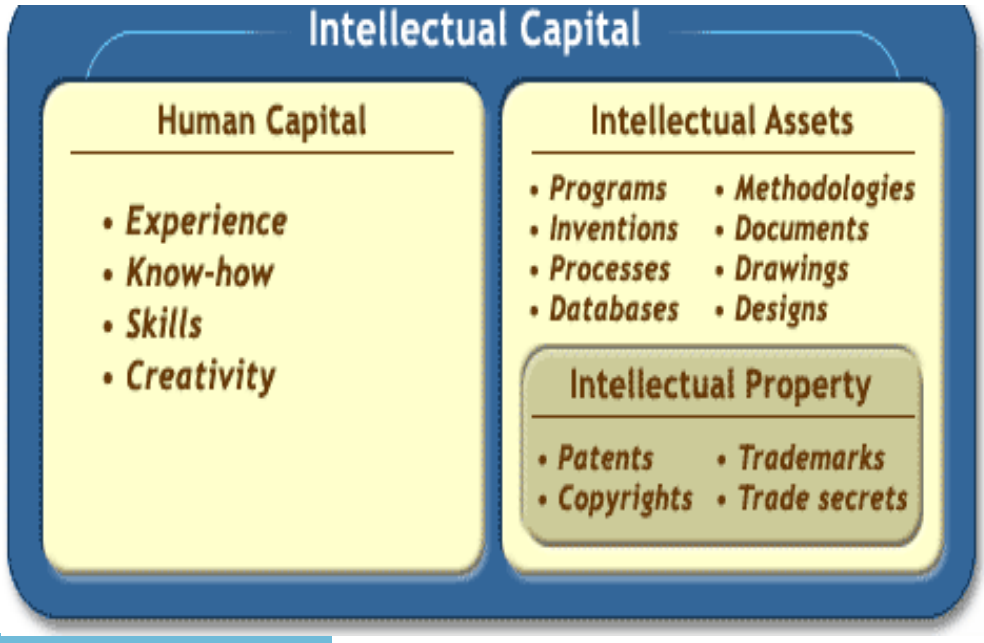
Which is the best tool? They concluded that there is no clear-cut answer as to the best tool. In fact, they believed that any answer would be just claim and harmful. There is no universally best tool; there are only tools that are more or less appropriate to specific situations and organizations.

The following section will briefly discuss the most widely used methods and models to measure and manage intellectual capital:

Intellectual Capital Management (ICM), US Group Model:

Sullivan (2007, P.4) article "Advanced Definitions and Concepts" defined intellectual capital as knowledge that can be converted into profits, and he divided intellectual capital into two major elements: Human capital and intellectual assets (figure 2.1). Sullivan on page (5) stated that human capital consists of an organization individual employees. Each of whom has experience, skills, Ability (creativity), and know-how.

Figure (2.1): Sullivan's Model (ICM) Group (2001)



Source: Sullivan (2001). Profiting from Intellectual Capital: Extracting Value from Innovation. Patrick Sullivan (ICM Group) Models, LLC, Intellectual Property Series, August 8, 2001, P.4, New York. John Wiley and Sons.

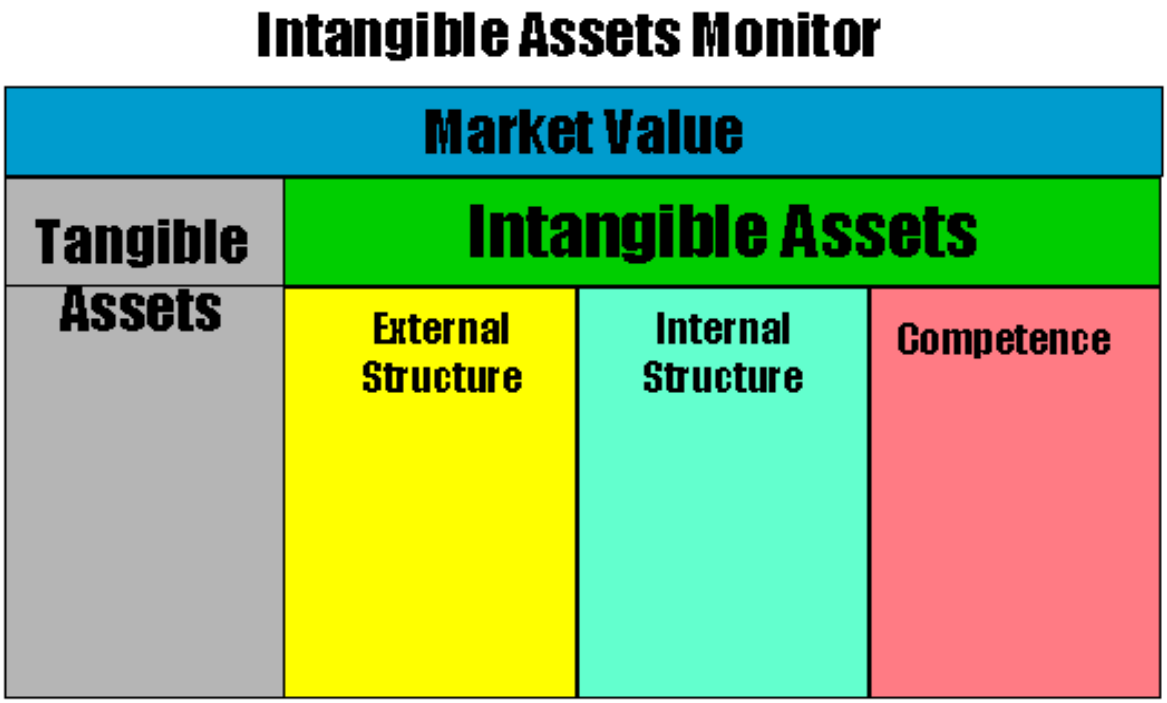
Intellectual assets (programs, inventions, processes, databases, methodologies, documents, drawings, and designs) are created by the human capital: Experience, skills, creativity, and know-how. Once these are documented, the knowledge is codified and defined. At this point, the organization can deal with the intellectual asset more freely and move the assets to wherever it is needed. Any item that is legally protected is called intellectual property. Intellectual property includes patent, copyrights, trademarks, and trade secrets. Then on page (6), he added the structural capital to the model and described it as the hard assets of the organization e.g. buildings, machinery and other infrastructure.

Sveiby's Intangible Asset Monitor (IAM) Model:

According to Sveiby (2004, P.4-5), the intangible assets are categorized into three families (figure 2.2): The external structure consists of relations with customers and suppliers, which form the basis for the reputation (image) of the organization. The family of internal structure can be seen to hold patents, concepts, models, templates, computer systems and other administrative more or less explicit processes. These are created and maintained by the employees and are generally "owned" by the organization. The "culture" or the "spirit" can also be regarded as belonging to the internal structure.

The people also included in the internal structure family, such as support staff, accounting, and management. The individual competence family consists of the knowledge workers and their competences, i.e. professional/technical staff, the experts, the R&D people, the factory workers & sales and marketing.

Figure (2.2): Sveiby's Intellectual Assets Monitor (IAM) Model (1987)



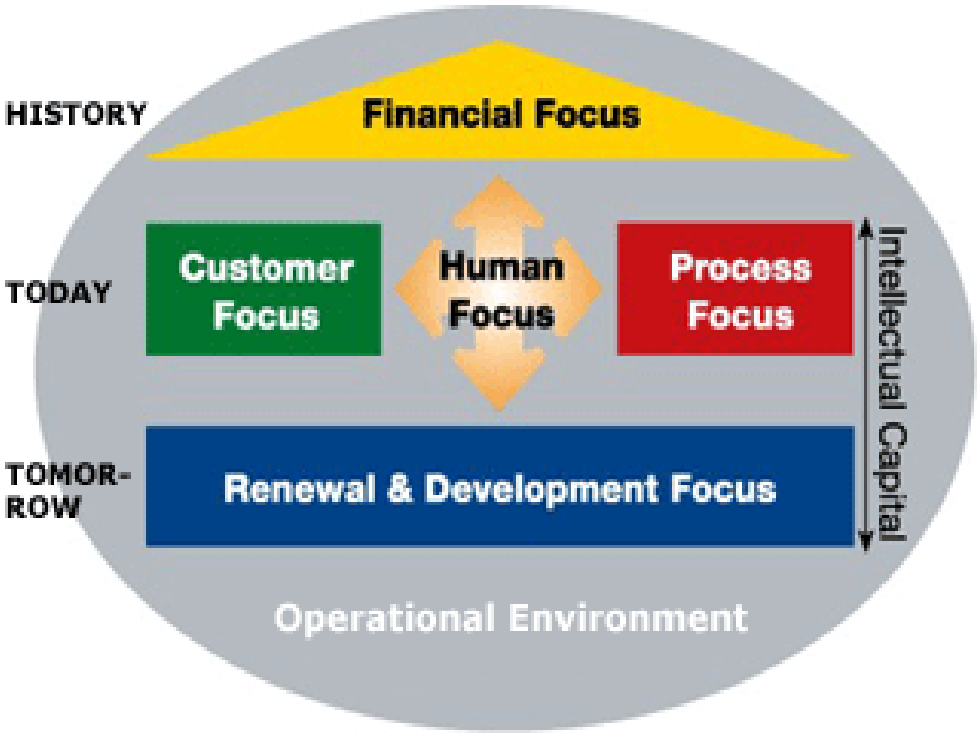
Source: Sveiby (1997): The "invisible" Balance Sheet, 8 September 1997, Dec 1998, Oct 2001 (on-line). Available at: www.Sveiby.com and www.sveibytoolkit.com/. Cited on: July 14, 2006.

Sveiby's (1997, P.1) model identifies three sets of measurement indicators: Growth and renewal, efficiency, and stability for each of the three intangible assets areas: External structure, internal structure, and human competence.

Skandia's Intellectual Capital Navigator (Edvinsson and Malone Model):

According to Bontis (2001, P.44), "Skandia is considered the first large organization to have made a truly coherent effort at measuring knowledge assets". Skandia (2007) stated that the first worldwide report on intellectual capital was issued by Skandia in 1994, and was on its intangible assets. While Skandia's annual report 1995 was the first official worldwide annual report about intellectual capital.

Figure (2.3): Skandia's Intellectual Capital Navigator

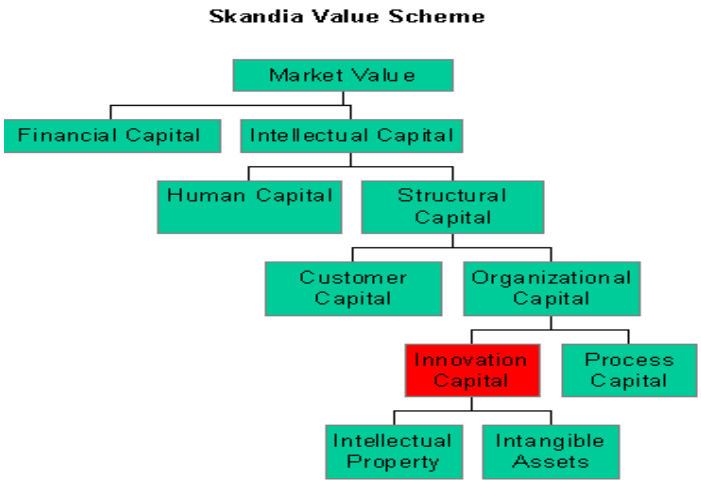


Source: Skandia (2007a). Intangibles Valuation: Skandia Navigator Intangibles Valuation: Skandia Navigator. Available at: Value Based Management.net - Last updated: May 1, 2007, and Website: www.Skandia.com. Cited on: August 10, 2007.

Skandia (1995, P.3) classified intellectual capital into five areas of focus (figure 2.3): Financial capital, customer, process, renewal and development, and human focus. The model also divided data into three sections: Past, present, and future. Skandia stated that the concept of Navigator is based on the total market value of the organization, which is equal to its financial capital and intellectual capital. The intellectual capital was divided into four components: Market (customer) capital; process capital; renewal and development (structural) capital, and human capital. The Skandia's model was called as Navigator or metaphor, because it was similar to a house that has a roof, walls, and floor.

Skandia (1997, P.1) classified intellectual capital into: Human capital and structural capital. Structural capital is divided into organizational capital and customer capital. Organizational capital in turn is divided into innovation capital and process capital. In some studies, innovation capital is divided into intellectual property and intangible assets (figure 2.4).

Figure (2.4): Skandia's Market Value Scheme Model (1997)



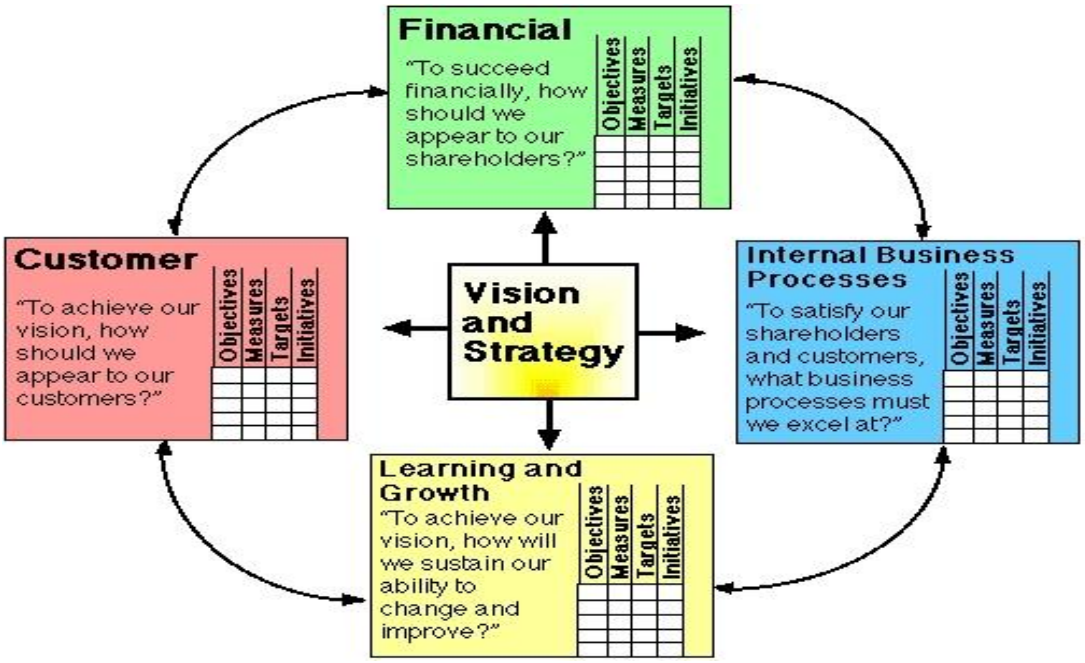
Source: Amidon, D.M. (1999) Power of Innovation. Entovation International, Ltd. (Wilmington). Available at: http://www.entovation.com/innovation/skandia.htm, Last updated: 22 Aug 1999, and http://www.skandia.se. Cited on: August 03, 2007.

The Skandia's model attempts to provide an integrated and comprehensive picture of both financial capital and intellectual capital for organizations and nations.

Balanced Score Card (BSC): Norton and Kaplan's Model

Arveson (1998, P.1) describes the balanced scorecard as a management system (not only a measurement system) that enables organizations to clarify their vision and strategy and translate them into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve strategic performance and results.

Figure (2.5): Arveson's Balanced Scorecard Model (1998)



Source: Arveson (1998): What is the Balanced Scorecard? Balanced Scorecard Institute (online P.2). Available at: www.balancedscorecard.org. Cited on: November 05, 2007.

Arveson (1998, P.1) said that the balanced scorecard view the organization from four perspectives (figure 2.5): 1) The learning and growth perspective; 2) The business process perspective; 3) The customer perspective; 4) The financial perspective. For each perspective, there are four sections: Objectives, measures, targets, initiatives and time frame.

2.6. Study Model

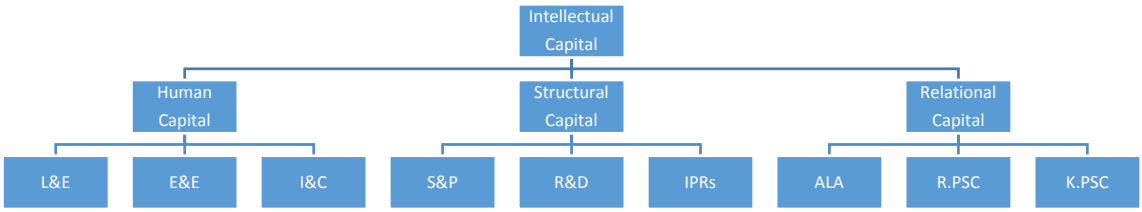
Whatever the classification used in any research or literature, the aim was to understand, measure and manage the intellectual capital. In most researches, the intellectual capital was divided into three components: Human capital, structural capital and relational capital. This study uses the most widely used classification model in many recent researches and literature that is fundamentally based on both Stewart's and Bontis's classification as follows: Human capital, structural (organizational) capital and relational (customer) capital. After that, the researcher divides each intellectual capital element (variable) into three components (sub-variables) as shown in figures (2.6):

Human Capital (HC): Learning and Education (L&E), Experience and Expertise (E&E) and Innovation and Creation (I&C).

Structural Capital (SC): Systems and Programs (S&P), Research and Development (R&D) and Intellectual Property Rights (IPRs).

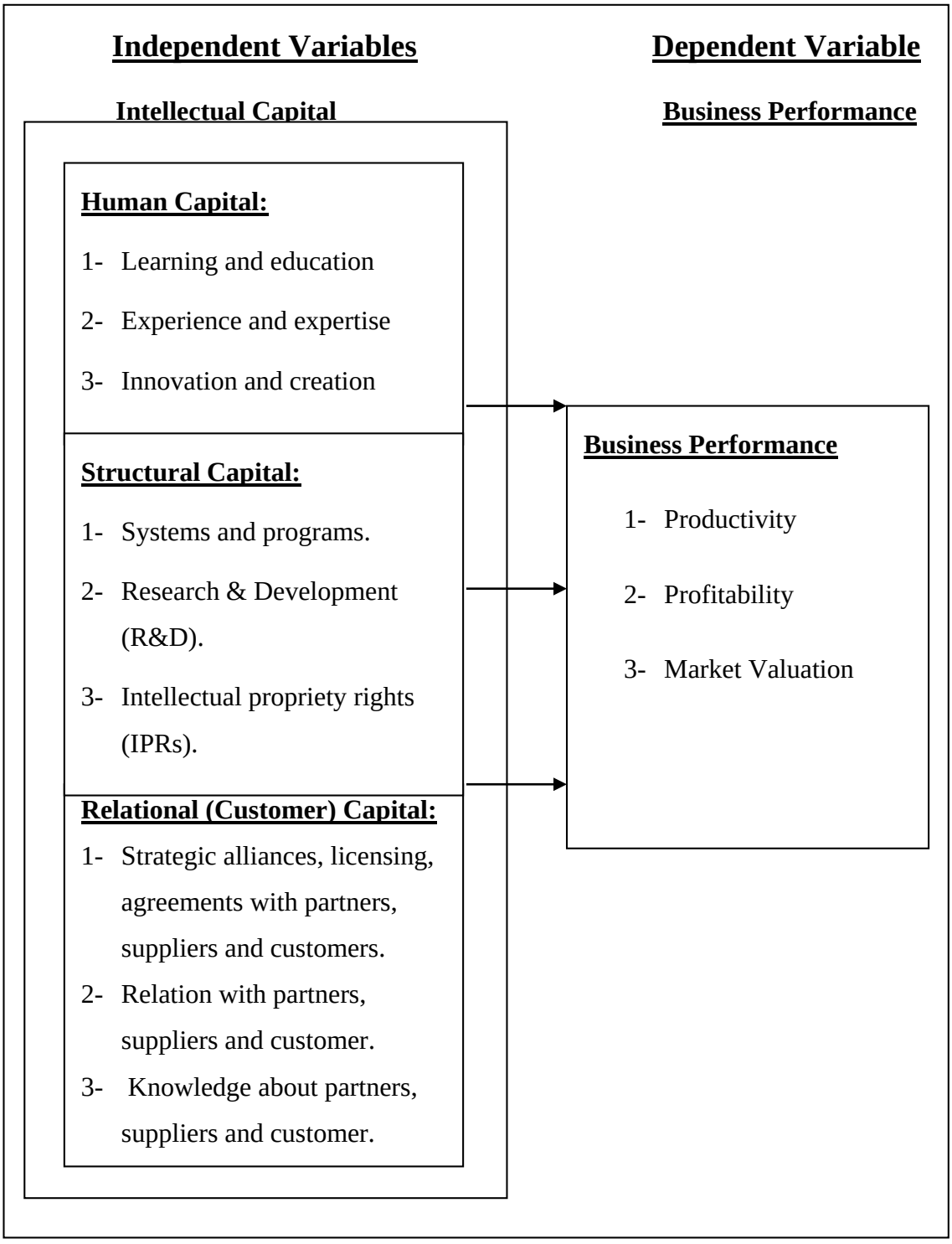
Relational Capital (RC): Alliances, Licensing and Agreements (ALA), Relations with Partners, Suppliers and Customers (R.PSC) and Knowledge about Partners, Suppliers and Customers (K.PSC).

Figure (2.6): Study Basic Model



The current research studies the effect of intellectual capital variables and sub-variables on JPM Organizations' business performance as shown in the study model figure (2.7).

Figure (2.7): Study Model



Chapter Three

Review of Related Literature

This chapter introduces the previous related studies on the intellectual capital issue. First, the chapter reviews the available studies about intellectual capital disclosure in different countries, followed by intellectual capital and market valuation. Then it introduces some studies related to intellectual capital and business performance in general, and business performance in the Biotechology industry in specific. Afterwards, the researcher highlights some points that express the contribution of his work as compared with previous studies. To the best of the researcher's knowledge, Seleim and Ashour (2004) study was the only research conducted in one of the Arab countries (Egypt) about the intellectual capital topic in software industry.

3.1. Previous Literature Review:

1- Bontis (2005) study "Intellectual Capital Disclosure in Canadian Corporations", aimed at studying the issue of Canadian corporate intellectual capital disclosure. The content analysis method was employed to analyze the annual reports of 10,000 Canadian corporations. Bontis (2005) concluded that intellectual capital has a very strong impact on the drivers of future earnings, but it was largely ignored in Canadian financial reporting. Using the language of intellectual capital is an important antecedent to develop intellectual capital statements,

but Canadian organizations seem to be significantly behind its Scandinavian counterparts to use intellectual capital terms in their annual reports.

2- Vergauwen and Van Alem (2005) research "Annual Report Intellectual Capital Disclosures in the Netherlands, France and Germany" aimed at replicating and extending the Bontis above research of 2000, which was republished in 2005, and elaborating on the Beaulieu's et. al. (2001) research on intellectual capital disclosures by Swedish organizations. They studied intellectual capital disclosures by selected French, Netherlands (Dutch) and German organizations annual report for the years 2000 and 2001. Vergauwen and Van Alem (2005) concluded that the voluntary disclosure related to intellectual capital is strongly varied among countries. Their research indicated significantly higher average disclosure in French annual reports relative to their Dutch counterparts. The German average is in between but it is not significantly different from both countries. All three countries showed much larger disclosure average as compared with results of Bontis (2000). This emphasizes the conclusion that intellectual capital related disclosures are applied on a wider scale in European countries than in Canada.

3- Garcya-Meca and Martynez (2005) study "Assessing the Quality of Disclosure on Intangibles in the Spanish Capital Market". The study aimed first, at analyzing the quality of the disclosure on intangibles in the Spanish capital market. Second, enhancing organizations knowledge of the intellectual capital disclosure quality.

Garcya-Meca and Martynez (2005) analyzed reports of all financial analysts regarding Spanish organizations listed in the Madrid Stock Exchange Market during 2000 and 2001. Garcya-Meca and Martynez (2005) concluded that the specificity of intellectual capital disclosure varies according to information categories. Customers, strategy and technology are the categories of intangibles most reported in quantitative form. On the contrary, when organizations disclosed information related to human capital to financial analysts, such information was usually revealed in qualitative terms. The multivariate results indicate that the information about intellectual capital is more specific in larger organizations, that were more profitable and with less debt.

In brief, the study found that there are differences in the quality of the information reported to financial analysts in Spain, and that several factors, such as; organization size and the levels of profitability and leverage were highly influencial.

4- De Pablos (2005) research "Intellectual Capital Reports in India: Lessons from a Case Study", aimed at answering the question: Are there any differences between Indian intellectual capital reports and European intellectual capital reports? If so, what ideas can be derived from these differences? Three leading Indian organizations were used to analyze how Indian organizations build the intellectual capital report, and results were compared with European reports.

De Pablos (2005) concluded that the Indian intellectual capital report does not focus on the business model, values, mission and vision and/or knowledge management issues as in the case of European intellectual capital reports. The Indian intellectual capital report presents a narrative style, which describes an organization's intellectual capital and analyses its components without focusing extensively on specific indicators that measure the components. In contrast to European intellectual capital reports, Indian reports do not combine a narrative and quantifying style. All Indian intellectual capital reports analyzed in this case study constitute independent documents that complement the annual report.

5- Miller et. al. (1999) study "Measuring and Reporting Intellectual Capital from a Diverse Canadian Industry Perspective: Experiences, Issues and Prospects". The study aimed at examining the perceptions of managers in selected organizations about the usefulness and the potential use of intellectual capital indicators. The survey sample was composed of managers drawn from four Canadian organizations. All of the (226) managers were surveyed by means of a questionnaire developed after an initial pilot study was conducted. The indicators were divided into the three classifications of human, structural and customer capital indicators.

Miller et. al. (1999) concluded that the four organizations place a heavy emphasis on the usefulness of human capital indicators regardless of their industry type or degree of capital intensity. Managers in these organizations have the greatest amount of consensus with respect to using and

seeing usefulness of the human and customer indicators over structural capital indicators. Although human resource represents an organization's most important asset, the interaction between human, structural, and customer capital cannot be ignored.

6- Kukko et. al. (2003) research "The State of Intellectual Capital Management in the Finnish Top 50 Companies, Finland", aimed to describe the history and the current state of intellectual capital management, as well as, to describe what are the rationales of using intellectual capital management?

Kukko et. al. (2003) concluded that the Finnish top 50 organizations had recognized the importance of human capital in their business. Still the concepts of intellectual capital management have not been stabilized in the Finnish language and this might be one reason why intellectual capital management is still vague. Almost every surveyed organization had systematic activities for dealing with intellectual capital management. The most important aspects of intellectual capital management were related to managing intangible assets. All respondents emphasized the importance of intellectual capital managements' role in gaining knowledge on personnel competencies. The aim of intellectual capital management in most of the surveyed organizations was to develop personnel competencies and knowledge.

7- Seleim and Ashour (2004) research "Intellectual Capital in Egyptian Software Firms". The study objective was to contribute to the intellectual capital theory development by building a measurement system in a unique context.

The target population was all the 107 member organizations of the Software Industry Chamber in Egypt. Data were collected from public annual reports, balance sheets, interviews and questionnaires completed by the chief executive officers (CEOs).

Seleim and Ashour (2004) concluded that no empirical research had been conducted at the organizational level in the field of intellectual capital in the Arab countries, thus their study as stated was the first to investigate the nature of human, structural, and relational capital in Egyptian Software Organizations. Their results revealed that the Software Organizations in Egypt possess many elements of intellectual capital and these elements can be, in fact, measured. Then, they stated that the reported approach for measuring the components of intellectual capital would help in institutionalizing the standardized measures for benchmarking purposes in Software Organizations. Moreover, they elaborated and said their study aimed to encourage organizations to develop customized measures that contribute to the process of establishing tailored intellectual capital measures for each organization based on their own vision, strategy, and objectives. Then, they stated that ultimately, intellectual capital measurement helps CEOs in the said organizations to realize their competitive position.

8- Gallego and Rodryguez (2005) study "Situation of Intangible Assets in Spanish Firms: An Empirical Analysis". The study aimed to analyze, both theoretical and empirical points of view, and to highlight the significance of intangible assets in Spanish organizations, listed in the Spanish Securities and Exchange Commission (CNMV).

Gallego and Rodryguez (2005) concluded that the financial directors do not believe it is appropriate to include in the balance sheets factors such as; customer bases, employee experience, and the technology of the productive processes. The majority of researched individuals have not changed their consideration of intangible assets, and they consider R&D and software application expenses as intangibles. The study also revealed that the employee's experience, teamwork capacity, procedures and systems, brand image, and customer relationships as relevant intangibles.

9- Moslehi et. al. (2006) paper "Introducing a Toolbox for Intellectual Capital Measurement in the Iran Insurance Industry", aimed to introduce a new approach for measuring intellectual capitals regarding a holistic perspective of intellectual capital and knowledge management. This new approach was deployed in Iranian insurance industry. The survey included the 6 main insurance organizations and 139 questionnaires were completed. Moslehi et. al. (2006) concluded that the intellectual capital toolbox does not disclose the value of the organization's intellectual resources, rather, the toolbox discloses 3 aspects of the organizations, including intellectual capital stocks, knowledge-management processes (intellectual capital processes) and intellectual capital performances. Based on the result of toolbox, it can be learned that the potential of intellectual capital is so considerable, but in spite of the importance of these capitals, the insurance industry ignores them. This may be due to the monopoly of the public organizations. At the end, this toolbox tries to give organizations the opportunity to better understand the intangible aspect and casual relations within the organization.

10- Haar and Sundelin (2000) thesis "Intellectual Capital: a Determinant of Market Value Volatility". The thesis aimed to develop and test the hypothesis: The more transparent the organization is with regard to its intellectual capital, the less volatile its market value will be. Haar and Sundelin (2000) used both inductive and deductive methods. First, they screened the field for relevant literature in order to form a theoretical framework and a general understanding of the subject. Then, data were collected from a sample of information technology internet consultants.

Haar and Sundelin (2000) concluded that transparency may have an impact on market value volatility. The relationship between transparency and volatility was found, considering the data, rather strong but needs to be verified through further research work.

11- Berglund et. al. (2002) thesis "Intellectual Capital's Leverage on Market Value, in Swedish". The thesis aimed at visualizing whether there is a correlation between value added per employee, as an approximate measurement of intellectual capital, and stock exchange value per employee among Swedish organizations. The aim of using the results is to further examine a possible indicator and IC Multiplier (SC/HC) for leveraging the efficiency of intellectual capital. The data consist of financial data from 40 organizations listed on the Stockholm Stock Exchange Market. Organizations were divided into four industry sectors and were distributed by the organization's size and age. Berglund et. al. (2002) study results showed that there was a correlation between the organization's value added and its stock exchange value.

It also showed strong correlations, especially concerning the organization's size and age. However, the results also proved that most organizations do not have enough structural capital to support the human capital. Accordingly, a conclusion was drawn, that the researched Swedish organizations cannot exploit the value of its employees' brains to their full potential. In fact, the low amount of structural capital that exists within organizations constrains the employees. The low structural capital ratio makes the organizations risky for the investors. To lower the volatility of the researched organizations stocks and make them more attractive for investors, the IC Multiplier must be improved, because there is a relationship between the IC Multiplier and market value. The reason for this relationship is that the IC Multiplier affects the intellectual capital, which in turn affects the market value. The leverage effect regarding these both relationships means that a small improvement of the SC/HC ratio can dramatically affect the market value.

12- Cuganesan (2005) paper "Intellectual Capital (IC)-in-Action and Value Creation: A Case Study of Knowledge Transformations in an Innovation Project, Australia". The paper aimed to address the need for empirical investigations of the inter-relationships between different intellectual capital elements and their value creation consequences.

An in depth case study of innovation project within an Australian financial services organization was conducted in 2000 and 2001. The data covered formal and informal interviews and the collection of documentation.

Collected data were analyzed in terms of the components of the tripartite intellectual capital model: Human, structural and customer capital.

Cuganesan (2005) concluded that the complex picture of pluralistic relations was observed between intellectual capital components: Human, structural and customer capitals, reflecting particular choices about which intellectual capital element can be transformed into other elements. The actual intellectual capital inter-relationships that occurred were different from the organizational participant expectations. Considering IC-in-action, inter-relationships between different intellectual capital elements and value creation were found to be pluralistic and temporally contingent. Theoretical and empirical result showed that intellectual capital inter-relationships as primarily consisting of multiple relations of cause-and-effect in a one-to-one or one-to-many manner. The study also explained how intellectual capital resources transform each other, often in a pluralistic and fluid manner.

13- Rose (2005) study "Valuing Intellectual Capital". The study aimed to determine how organizations have cultivated, managed and fully utilized their intellectual capital, so as to derive maximum benefit from their knowledge assets. 46 leading-edge organizations in the U.S., Canada, Europe and the Middle East were included in the study. Rose (2005) concluded that for an organization to sell innovative solutions, it must behave as an innovator, and to sell information, it must itself be a prototype of a knowledge organization. The organization's human resources are huge untapped source of improved performance.

People and their capabilities are unique, and thus can provide seemingly unending reservoirs for competitive distinction. But brain power or human capital is not easily captured i.e. human mental and physical involvement are not enough, commitment comes when the heart and soul are involved. At the end of the study, Rose (2005) concluded that existing business structures, systems and processes are often quite against new and innovative ideas.

14- Subramaniam and Youndt (2005) study "The Influence of Intellectual Capital on the Types of Innovative Capabilities". The study aimed at investigating how the aspects of intellectual capital are influencing various innovative capabilities in organizations. A longitudinal study of 93 organizations method was used. Subramaniam and Youndt (2005) concluded that human, organizational, and social capital and their interrelationships selectively influenced incremental and radical innovative capabilities. Organizational capital positively influenced incremental innovative capability, while human capital interacted with social capital to positively influence radical innovative capability, indicating that the importance of human capital is strongly tied to social capital. Against the expectations, human capital had a negative influence on radical innovative capability. While social capital played a significant role in both types of innovation, as it positively influenced incremental and radical innovative capabilities.

15- Salleh and Selamat (2007) study "Intellectual Capital Management in Malaysian: Public Listed Companies", aimed at examining the differences in the degree to which organizations of different industries, types and sizes adopt intellectual capital management in their business models. The study adopts the instrument developed by Bontis (1998) to measure the 3 dimensions of intellectual capital: Human capital, structural capital and customer capital. Salleh and Selamat (2007) concluded that on average the Malaysian organizations employ elements of intellectual capital in their business model. On the contrary of some evidence, there were no significant differences in the degree to which organizations of different industries, types and sizes adopt intellectual capital management in their business model. However, there were significant differences among sub-categories of local-based organizations and foreign-affiliated organizations. For foreign-affiliated organizations, European-affiliated organizations tend to adopt higher human capital and Singapore-affiliated organizations tend to adopt higher structural and customer's capital than their Japanese counterparts.

16- Roos and Roos (1997) study "Measuring your Organization's Intellectual Performance". The objective of the study was to develop and later to test an intellectual capital process model that will provide the basis for assessing intellectual performance. The data were collected through interviews from 25 organizations from different industries and different sizes. Roos and Roos (1997) concluded ten points as follows: 1) There seems to be three prerequisites for developing an intellectual capital system: First,

the organizations must be mature enough to have gone beyond the stage of discussing business performance only in financial terms; second, the organizations must have a clearly defined business idea or direction; third, there must be a clear operational commitment to move ahead which is supported by top-management. 2) The intellectual capital system should capture only the intellectual capital growth or decline that impact the long-term earning capability of the business. 3) The intellectual performance system must also be rooted in the language of the organization. 4) To be measured, intellectual capital obviously needs to be categorized. 5) The vehicle for measuring intellectual performance is the set of indicators used for each intellectual capital category. 6) The balance sheet approach to intellectual capital is a snapshot in time of the intellectual capital situation and does not provide information on the transformation of one intellectual capital category into another. 7) There are at least three complementary ways to derive indicators: First, develop indicators grounded in the drivers of the vision and/or direction expressed; second, develop indicators grounded in the intellectual capital categories selected; and third, develop indicators grounded in inter-capital flows. 8) There are many analytical difficulties in handling indicators, such as selecting, ranking, reliability, precision and multicollinearity among indicators. 9) Any intellectual capital model must be scaleable; it should make sense for large as well as small organizations, also for parts of organizations as well as individuals. 10) Intellectual capital system must be aligned with existing managerial processes.

17- Bontis et. al. (2000) study "Intellectual Capital and Business Performance in Malaysian Industries". The study aimed at investigating the three elements of intellectual capital, i.e. human capital, structural capital and customer capital and their inter-relationships within two industry sectors in Malaysia: service and non-service industries. Bontis et. al. (2000) concluded that human capital is important regardless of industry type; human capital has a greater influence on how business should be structured in non-service industries compared to service industries; customer's capital has a significant influence over structural capital irrespective of industry; and finally, the development of structural capital has a positive relationship with business performance regardless of industry.

18- Firer and Stainbank (2003) study "Testing the Relationship between Intellectual Capital and an Organization's Performance: Evidence from South Africa". The purpose of the study was to investigate whether the organization's intellectual capital can explain organizational performance. Three dependent variables related to organization's performance: Profitability, productivity and market valuation were used in the analysis. Data were collected from the annual reports of 65 South African publicly traded organizations. Firer and Stainbank (2003) concluded that the empirical analysis indicated that the relationships between the organization's intellectual capital and profitability, productivity and market valuation are informative but varied. The empirical findings showed that the organization's intellectual capital could explain profitability and productivity, but not market valuation. Firer and Stainbank (2003) also concluded that intellectual capital was dominating the way in which organizations were valued,

because it alone could capture the dynamics of organizational sustainability and value creation. Intellectual capital alone recognizes that a modern organization changes so rapidly that everything is dependent on its talents, the dedication of its people (human capital) and the quality of the tools that they use (structural capital). Finally, Firer and Stainbank (2003) concluded that the traditional valuation models that do not include intellectual capital as a major component would fail, because without intellectual capital the true value of an organization will never be uncovered.

19- Kujansivu and Lonnqvist (2005) research "How Do Investments in Intellectual Capital Create Profits? Finland". The research aimed at determining how investments in intellectual capital are transformed through various stages into profits. The data used were obtained from Finnish organizations during the period from 2001 to 2003, and represented eleven largest industries in Finland.

Kujansivu and Lonnqvist (2005) concluded that the research empirical evidence support the assumptions concerning the relationships between factors related to intelectual capital and productivity and profitability. Against expectations, the results showed that there is no linear relationship between investments in intellectual capital and profitability. However, investments in intellectual capital seem to improve the value of intellectual capital, which seems to lead to higher productivity.

20- Huang and Liu (2005) study "Exploration for the Relationship between Innovation, Information Technology and Performance, Taiwan". The purpose of this study was to answer two important questions: 1) Do the investments of innovation capital and information technology (IT) have a non-linear relationship with organization performance? 2) Does the interaction between innovation capital and information technology capital have synergy effects on organization performance? The sample of the study included the top 1,000 organizations in Taiwan.

Huang and Liu (2005) concluded that the innovation capital has a non-linear relationship (inverted U-shape) with organization performance, and IT capital has no significant impact on organization performance. However, after considering the interaction between innovation capital and IT capital, there was a positive effect on organizations' performance. Moreover, the research results suggested that more investment in intellectual capital is not always better. Organizations should coordinate different perspectives of intellectual capital to improve organization performance.

21- Wang and Chang (2005) study "Intellectual Capital and Performance in Causal Models: Evidence from the Information Technology (IT) Industry in Taiwan". The study aimed at investigating the impact of intellectual capital elements on business performance, as well as the relationship among intellectual capital elements from a cause effect perspective. Data were collected from organizations listed in the IT industry during the period 1997-2001. Both accounting earnings and stock price are included as performance measures.

Wang and Chang (2005) results showed that intellectual capital elements directly affect business performance, with the exception of human capital. Human capital indirectly affects performance through the other three elements: Innovation capital, process capital, and customer capital. The cause-effect relationship among the four elements of intellectual capital strongly exists. Human capital affects innovation capital and process capital. Innovation capital affects process capital, which in turn influences customer capital. Finally, customer capital contributes to performance. In summary, human capital is the primary leading factor in which management should put the most effort.

22- Bin Ismail (2005) dissertation "The Influence of Intellectual Capital on the Performance of Telekom Malaysia (Telco)". The dissertation aimed to investigate the influence of intellectual capital on the performance of Telekom Malaysia. The data were collected via interviews and questionnaire survey. Independent variables are human capital, structural capital, relational capital, spiritual capital, knowledge management and managing & leveraging of intellectual capital. The dependent variable is performance improvement in the aspect of organizational and business leadership, operating efficiency and business performances.

Bin Ismail (2005) dissertation concluded that there was a strong positive relationship among all the intellectual capital components (human capital, structural capital, relational capital and spiritual capital),

and with the overall performance of Telekom Malaysia. All components of intellectual capital had a positive significant relationship with performance, regarding organizational leadership and business leadership.

The managing and leveraging of the intellectual capital was critically important and had the greatest positive significant relationship to the performance compared to the component of intellectual capital itself. Knowledge management had an indirect positive significant relationship with the performance. Knowledge management had a positive relationship with the managing and leveraging of intellectual capital and all the components of intellectual capital.

At the end, Bin Ismail (2005) concluded that by having a stronger spiritual capital within the higher management to manage and leverage the present intellectual capital, Telekom Malaysia will have a higher level of intellectual capital and will achieve further performance improvement.

23- Young (2006) study "Intellectual Capital, Value Creation and Firm Performance: Evidence From the Taiwanese Industries". The study aimed at investigating the relationships among intellectual capital components, value creation and organization performance. The survey data were collected from chief executive officers (CEOs) of 211 Taiwanese organizations. Young (2006) empirical results indicated that there are significant positive linkages between intellectual capital components, value creation and an organization performance. Specifically,

intellectual capital exhibits indirect effects on performance through the value creation of increased benefits. Benefits-increasing value creation acts as an important mediator between intellectual capital and an organization performance. Finally, Young (2006) concluded that the study result supported the argument that the leveraging of intellectual capital components allow the organization to create and sustain a competitive advantage.

24- Sofian et. al. (2004) study "Intellectual Capital: An Evolutionary Change in Management Accounting Practices in Malaysia". This paper aimed to examine whether the degree and form of intellectual capital possessed within organizations influences management accounting practice (business performance). The study was conducted through survey and interviews with executives in over 100 large Malaysian public organizations. Data were collected, from March to August 2003, and 119 responses were received, questions were related to variables for human, structural, and relational capital.

Sofian et. al. (2004) concluded that the organizations were concerned about all intellectual capital elements: human, structural and relational capital at almost the same level. In addition, they found that the level of investment in intellectual capital is associated with business performance, and the ability to respond to future events. The organizations with higher intellectual capital level tend to achieve higher levels of overall business performance levels, and should be in a better position to be able to manage unanticipated economic and market changes.

The Profit is associated with a higher emphasis on intellectual capital. Shareholder value is strongly associated with high levels of human, structural and relational capital, while the economic value added is associated with structural capital. With greater structural capital, the organizations were performing better; therefore, organizations investing more heavily in structural capital are in better position. Strong association was found between intellectual capital and staff creativity/innovation to ensure long-term survival. Only high relational capital was reflected in recent stock market performance.

25- Bukh et. al. (2005): study "Disclosure of Information on Intellectual Capital in Danish Initial Public Offering (IPO) Prospectuses", aimed at examining whether information on intellectual capital is disclosed in Danish (IPO) prospectuses. The data consisted of the IPO prospectuses from all stock exchange listings at the Copenhagen Stock Exchange Market from 1990 to 2001. Bukh et. al. (2005) concluded that voluntary disclosure of information on intellectual capital in Danish IPO prospectuses has increased substantially in the last decade. This development can partly be related to the fact that relatively more information technology (IT) and pharmaceutical organizations in the later years were covered through the study, and the prospectuses of these organizations' types generally included more information on intellectual capital. Based on statistical analysis, it was concluded that the extent of managerial ownership prior to the IPO and industry type affected the amount of voluntary intellectual capital disclosure. While organization size and age, do not affect disclosure.

The results also indicated that the organizations' managements believe that this type of information is important in the capital market's assessment of the organization's value.

26- Chen (2004) study "Intellectual Capital and Competitive Advantages: The Case of TTY - Biopharm Company - Taiwan". The study aimed to depict the role of TTY's intellectual capital in building competitive advantages and enhancing the achievement of corporate strategies. By conducting in-depth interviews with the chief executive officer (CEO) and top management of TTY Biopharm Organization.

Chen (2004) concluded that because the Taiwan's pharmaceutical market size is small, it seems economically infeasible to support the whole phases of a new drug research and development (R&D), covering discovering new chemicals to developing new drugs. However, TTY's success illustrated that even in a relatively small home market size, adopting adequate R&D strategies and investing in intellectual capital can bear fruitful results. By developing intellectual capital, the organization is able to maintain quality workforce, enhance relations with stakeholders, fulfill R&D strategies, and establish a supportive organization. However, it might be economically infeasible for most pharmaceutical organizations in developing countries to compete with those global pharmaceutical giants in new drug R&D. Therefore, to have a role in the global market, it is essential for pharmaceutical organizations in developing countries to define their niche position in the industrial value chain, and then develop strategy-related intellectual capital to build up sustainable competitive capability.

27- Bollen et. al. (2005) research "Linking Intellectual Capital and Intellectual Property to Company Performance, German", aimed to link empirically the value of intellectual capital and intellectual property to organization performance. The survey data were collected from managers in five pharmaceutical organizations in Germany. Bollen et. al. (2005) concluded that the pharmaceutical industry was chosen because it combined all relevant four components of intellectual capital: Human, Structural, Relational Capital and Intellectual Property (IP). Bollen et. al. (2005) statistical analysis showed the following results: Human capital has a significant influence on the organization performance indicators: Market leadership, future outlook, overall performance and success of new products. Additionally, human, structural and relational capital have a significant influence on intellectual property, therefore intellectual property as an intermediary has an indirect influence on organization performance. In order to enhance organization performance, organizations have to focus on these variables and their items. Furthermore, when improving one of the components, the other two components are improved as well. Hence, the correlations between these items have to be well understood by the management in order to gain the most from its investments.

3.2. Expected Contributions of the Current Study as Compared with Previous Studies:

The concept of intellectual capital is a newly emerging concept, and until now, it is not fully understood by most organizations over the world. In Jordan,

the concept of intellectual capital was not well known to most managers and organizations including those managers who work in the Pharmaceutical Industry. The importance of measuring and managing intellectual capital is underscored in Jordanian organizations including pharmaceutical manufacturing organizations.

In the light of reviewing the previous literature about the intellectual capital topic, the researcher expects that his work contributions will not only add value to intellectual capital measurement and management in general, but also to the field of Pharmaceutical Industry.

1- **Intellectual capital concept:** The researcher expects that his study will open awareness for additional research work in this field.

2- **Purpose:** Most of the previous research works were conducted to measure and manage intellectual capital from the financial perspective, and to increase the organizations' intellectual capital disclosure. Few scholars conducted their work to study the impact of the intellectual capital elements on the organizations' business performance. The current study is focusing on the impact of intellectual capital elements on JPM Organizations' business performance (cause-effect model).

3- **Environment:** The majority of previous studies have been carried out in different countries outside the Arab region. The current study is carried out in Jordan, as one of the Arab region countries, to the best of the researcher's knowledge it might be the second work in the Arab region after Seleim and Ashour (2004).

4- **Industry:** Few researches about intellectual capital management considered pharmaceutical industry as a field of their work. The current research is dedicated to pharmaceutical industry only.

5- **Methodology:** Most previous studies either examined a sample of annual reports of different organizations and industries, or capitalized their work on a number of organizations i.e. case study. The current study covers all the JPM Organizations in Jordan.

6- **Population:** Almost all previous researches considered only public shareholders organizations that were listed in the stock markets, while the current study covered both public and private shareholders organizations in the Jordanian Pharmaceutical Industry.

7- **Variables:** Most of the previous researches divided the intellectual capital into three elements without considering their sub-variables. This study has considered the sub-variables of intellectual capital elements, and studied their effect on JPM Organizations' business performance.

8- **Method of Analysis:** The current study used partial least squares (PLS) technique in addition to the currently used analytical methods to test the effect of intellectual capital on JPM Organizations' business performance, and looked for inter-relations and interactions among intellectual capital variables and sub-variables, to reduce multi-collinearity.

9- **Comparison:** The researcher has compared results of his work with the results of previous studies mentioned earlier to highlight similarities and differences that might be there.

Chapter Four

Methods and Procedures

This chapter discusses the methodology employed by the researcher. In addition, the chapter explains how the data have been managed and dealt with throughout the study. The chapter begins by explaining the rationale of the study, study approach, study design, nature of the study, population, sample and unit of analysis. Then, it sheds light on methods of data collection for both primary and secondary data, and how the questionnaire has been built, after experts, panel of judges, and pilot study have assessed it. Finally, the chapter provides an overview regarding Jordanian Pharmaceutical Manufacturing Organizations and respondents' characteristics.

4.1Rationale for the Study:

The Pharmaceutical Industry is a knowledge based industry (Daum, 2005 P.17), most research-intensive industry (DeVol et. al. 2004 P.1), highly innovative one (Chen, 2004 P.19), and to a large extent dependent on its intellectual capital as a base for future success (Zucker et. al. 1994 P.29). Pharmaceutical Industry has a well-balanced combination of intellectual capital (Hermans 2004 P.1). Therefore, Pharmaceutical Industry is the perfect choice for analyzing all intellectual capital components (Bollen et. al. 2005).

In addition, the researcher states few reasons for exploring the topic of intellectual capital at this time. Nowadays most organizations are under pressure of expanding internationally and to utilize the latest technology,

to create competitive advantage. Most probably, all JPM Organizations are in transition from capital-intensive organizations to knowledge-based organizations. Attracting investors is recognized as a key strategy for growth. Intellectual capital as a crucial factor for success will differentiate organizations. Therefore, most organizations will face pressure to improve productivity and efficiency to position themselves as a part of the global economy. The solution might be hidden in the pool of intellectual capital.

This is why the researcher chose the Pharmaceutical Industry as a field for research. To address the importance of measuring and managing intellectual capital in Jordanian Pharmaceutical Manufacturing Industry, it was recommended to thoroughly understand how the managers in this industry measure and manage intellectual capital elements, and how they perceive the usefulness of intellectual capital indicators (Bollen et. al. 2005 and Chen 2004). Therefore, the researcher found it appropriate to examine pharmaceutical organizations, by applying the suggested model figure (2.7) on page (45) in order to test the effect of intellectual capital elements on their performance.

4.2. Study Approach:

Initially, the researcher has adopted Dr. Badwan's suggested topic of Intellectual Property Rights (IPRs) for this study. Later on, with the help of the supervisor Prof. Jawad and through literature reviews, discussions and interviews conducted with selective people in pharmaceutical industry, the topic was developed to deal with intellectual capital.

Formulation of the approach to the problem was guided by Prof. Jawad and made in co-operation with specialists in some JPM Organizations, who were purposefully selected for their academic reputation; one of them was Dr. Badwan, assuming each organization may have a different situation. People in the researched organizations played an important role in developing performance indicators and questionnaire, which assisted the researcher and put him on the right track. From the beginning, the researcher started with great enthusiasm that helped much in the process of developing performance indicators and the questionnaire. The researcher contributed with much knowledge about the intellectual capital and the other participants who have long experience with knowledge of JPM industry. Data about the indicators were collected from literature, and developed through expert interviews, (Appendix 1). Afterwards, the questionnaire was modified through referees (panel of judges) of academics and professionals, (Appendix 2). Then a pilot study was carried out to test the suitability, reliability and validity of the questionnaire. Finally, the official data was collected through questionnaire and annual reports.

This study is put to quantitative research, as the aim is to explore the effect of intellectual capital on business performance by applying a suitable tool. Thus the study should be evaluated according to the evaluation criteria of quantitative research. Concepts of validity and reliability are important in such study. Putting the research purpose i.e.

the effect of intellectual capital management on JPM Organizations' business performance into context alongside with the intellectual capital management objective i.e. intellectual capital as value creating activity, the research approach was justified.

4.3. Study Design:

For the measurement of intellectual capital, the researcher assumes that organizations within the same industry have similar processes, structures, needs, etc. Consequently, a conceptual measurement model has been developed and applied to an entire industry. The nature of the questions of the questionnaire requires a research design that is not limited to one single organization, because the researcher needs to generalize the results of the study. The theoretical part of the research was done through a thorough study and analysis of existing related literature. The purpose of analyses of previous literature was not only to find information about measuring and managing intellectual capital, but also to create a framework and model for measuring and managing intellectual capital. From the information on these subjects, as well as the existing models and frameworks that were found to be useful, the researcher was able to identify and develop criteria and variables to evaluate intellectual capital and its effect on organizations' business performance.

One of the ways to validate the theme of the current research is to investigate how organizations use their intellectual capital to improve business performance. Improving business performance requires managers to leverage different aspects of intellectual capital: human, structural,

and relational capital to successfully execute their projects. In order to empirically validate the study's model, a survey method was conducted in line with earlier studies. The data were collected from top and middle managers in the JPM Organizations. The collected data verified through the SPSS 15, 16, and Minitab 14 software focusing on the correlation among intellectual capital variables: human, structural, relational capital and their relationship with JPM Organizations' business performance. Annual reports for the years 2005 and 2006 were also used to fulfill the purposes of the study.

The current study is considered as a casual study. It aimed at investigating the cause/effect relationship between intellectual capital elements and JPM Organizations' business performance. It started with literature review and experts' interviews to develop the currently used measurement model and explore the intellectual capital profile of the JPM Organizations. Then, a panel of judges was conducted to finalize the items to be included in the questionnaire, and a pilot study to confirm reliability and validity of the questionnaire were carried out. Finally, the survey was conducted, and the results were compared with previous researches work.

4.4. Study Nature:

When implementing a research project, there are basically two ways to approach its goal, through either inductive or deductive method. This study applied a deductive method, because the study aimed at investigating the influence of intellectual capital on the JPM Organizations'

business performance. The study headed at establishing a developed way of thinking towards managing intellectual capital elements (human, structural, and relational capital) in Jordan. It was also the intention of the researcher to identify the present level of intellectual capital and investigate which component of intellectual capital elements has a more critical influence on the JPM Organizations' business performance.

4.5. Study Population, Sample and Unit of Analysis:

Population and Sample: The JPM Organizations are only fifteen organizations, which are registered in Jordanian Association of Pharmaceutical Manufacturers (JAPM) by January 2007. The entire population as shown in the table (4.1) was chosen to explore the topic of intellectual capital, thus negating any need for sampling.

Unit of Analysis: The survey unit of analysis is composed of all top and middle managers drawn from the JPM Organizations. At the time of study, there were about 200 managers in these organizations, all are targeted to be included in the study regardless of their title or educational background (General managers; Technical and operational managers; Business development and planning managers; Human resources & administrative managers; Research and development (R&D) managers; Production and engineering managers; Quality control and quality assurance managers; Marketing, training and development managers; Financial managers, and Registration managers). The researcher categorizes them into three categories: administration, production and marketing.

Table (4.1): The Organizations Involved in the Study and Number of Participants from each Organization in Pilot and Research Studies.

No.	Company Name	Established Year	Type	Pilot Study	
1	Arab Pharmaceuticals Manufacturing Company Ltd. (APM)	1962	Public	2	7
2	Dar Al-Dawa Development and Investment Company (DAD)	1975	Public	3	14
3	Hikma Pharmaceuticals (HIKMA)	1977	Public		3
4	Jordanian Pharmaceutical Manufacturing Company (JPM)	1978	Public	3	11
5	Arab Center for Pharmaceuticals and Chemicals (ACPC)	1983	Public		2
6	United Pharmaceuticals (UPM)	1989	Private		17
7	Amman Pharmaceutical Industries Company (API)	1989	Private		12
8	Ram Pharmaceutical Manufacturing Company (RAM)	1992	Private		2
9	Hayat Pharmaceutical Industries (HPI)	1993	Public		9
10	Philadelphia Pharmaceutical Industries Company (PHILAD)	1993	Public		8

11	Middle East Pharmaceuticals Manufacturing Company (MIDPHARMA)	1993	Public	1	11
12	Pharma International (INTER)	1994	Private	2	8
13	Jordan Sweden Medical & Sterilization Company, ltd (JOSWE)	1996	Private	2	8
14	Al-Kindi Pharmaceutical Industries Company (KINDI)	1997	Private		10
15	Jordan River Pharmaceutical Industries, L.L.C (JO-RIVER)	1999	Private	2	10
	Total			15	132

4.6. Data Collection Methods:

The data that have been used for fulfilling the purposes of the study can be divided into two groups: secondary and primary data. Data that have been previously obtained and collected by others for some other purposes and has been made available through a number of channels are known as secondary (second hand) data (Haar & Sundelin 2001). It may include both quantitative and qualitative data; such data have the advantages of providing a comparative and contextual data measures and may result in unforeseen discoveries. Secondary data were collected from Jordanian Association of Pharmaceutical Manufactures (JAPM), organizations' annual reports, journals, books, researches, thesis, dissertations, articles, working papers, and the Worldwide Web.

The data that has been obtained by the researcher is called primary (first hand) data (Sekran P.59). Such data flowed to the researcher from expert interviews, content analysis (annual reports and other related documents), panel of judges, pilot study and the survey which were performed by the researcher.

The Questionnaire: One of the main tools in actualizing a research project is the development of a tested instrument. Initial items to measure various constructs were developed depending on prior researches, especially Bontis's questionnaire (1998). With the help of Dr. Badwan (as an expert in pharmaceutical industry) the questionnaire was designed and developed in contrast with hypotheses and research model shown in Figure (2.7) page (45). Then the questionnaire was validated through expert interviews and a panel of judges.

Expert Interviews: The researcher chose to conduct selective interviews; such interviews were conducted to collect information about intellectual capital measurement tools, models and the organizations' profiles. Expert interviews were conducted with ten experts with high professional background (Appendix 1). The experts were chosen based on their established reputation in the field of the study and their ability to contribute sufficiently to the goals of the interviews.

Questionnaire Variables:

Independent Variables (Intellectual Capital): The independent variables are variables that (probably) cause, influence or affect outcomes. Independent variables also refer to assets that individuals and organizations actually do have.

Through literature review, the researcher has identified three important independent variables that contribute to JPM Organizations' business performance: human capital, structural capital, and relational capital.

Human Capital (items 1 to 30 in the questionnaire): In order to gain better overview, the items belonging to human capital are divided into three sub-variables: learning and education; experience and expertise; and innovation and creation.

Structural Capital (items 31 to 60 in the questionnaire): Which are summarized in three sub-variables: systems and programs; research and development; and intellectual property rights.

Relational or Customer Capital (items 61 to 90 in the questionnaire): they are also summarized in three sub-variables: Strategic alliances, licensing and agreements; relationships with partners, suppliers and customers; knowledge about partners, suppliers and customers.

Independent variables are divided into three sub-variables; each was tested by 10 questions: the first seven questions were designed to measure the employees' perception about actual implementation of each item.

While the last three questions were designed to measure the respondents' perception about the effect of each sub-variable on JPM Organizations' productivity, profitability and market valuation, respectively.

Dependent variable (items 91 to 100 in the questionnaire): Dependent variable of the study is related to JPM Organizations' business performance. Various studies such as Bontis (1998, 1999, 2001), Sofian et. al. (2004), Marr et. al. (2004), Wang and Chang (2005) Bollen et. al. (2005), Bin Ismail (2005), Housel and Nelson (2005), Mouritsen et. al. (2005), Tsan and Chang (2005) and Young (2006) have investigated the need to use objective, subjective, or a composite index to measure the organizations' business performance. Business performance of JPM Organizations was measured through 10 items that cover JPM Organizations' business performance.

All variables were measured by five-point Likert-type scale to tap into the individual's perceptions, ranging from value 1 (strongly disagree) to value 5 (strongly agree) used throughout the questionnaire.

Panel of Judges: The main objective of the panel of judges was to finalize the model and its items to be included in the questionnaire. Additionally, the idea behind the panel of judges was to incorporate any suggested change in the final version of the questionnaire. The researcher conducted two rounds; the first round was with 18 academics and professionals (Appendix 2)

from different Jordanian universities and pharmaceutical organizations to evaluate, select and arrange the questionnaire items, also to asses the model. Their comments were taken into consideration in modifying the questionnaire to improve the quality of the study's instrument. The second round was employed to revise the study instrument to ensure that the instrument is in clear language, uniformly understood by the respondents. The panel of judges helped the researcher to verify the logic of the model; furthermore, they provided him with valuable information.

Pilot Study: To be more in line with the pharmaceutical industry orientation the questionnaire was handed to fifteen managers from the organizations covered by the study (as shown in table 4.1) to be answered and to provide feedback for the researcher. This was considered as the pilot study of the research. The purpose of the pilot study was to ensure that managers would interpret and understand statements of the questionnaire clearly and unambiguously, and to make sure that the questions themselves were relevant. The pilot study results were used to test and evaluate the normality, reliability and validity of the study tools.

4.7. Data Collection and Analysis:

The covering letter with a five pages questionnaire in both languages (English and Arabic) was handed over to each participant. The researcher administered the data collection process personally. Since the intellectual capital topic was a new topic to most participants, the researcher conducted a special presentation about intellectual capital topic in each organization for all participants. Data have been gathered during

the period from May to July 2007. Questionnaires were delivered to 140 out of 200 top and middle managers, the remaining 60 managers were either out side of Jordan during the time of survey, or their organizations were not interested to include all their managers in the study. This resulted in sample rate of about 70% of the total managers' population. The researcher gathered only 136 questionnaires representing a response rate of 68%, because four respondents failed to return the questionnaires. Another four respondents failed to complete the questionnaire statements. Therefore, the actual number of questionnaires analyzed was only 132 representing 66% of the total unit of analysis, as shown in the above table (4.1).

Once the completed questionnaires were received back, the researcher checked them for completion. The responses were coded against SPSS 15 and Minitab 14 for Windows, later on SPSS 16 was used. Each variable and sub-variable of the intellectual capital was tested separately to find out its importance for JPM organization's business performance.

1. Kolmogorov-Smirnov Z Test for Normal Distribution:

In order to verify the normal distribution of variables and sub-variables, the researcher carried out Kolmogorov-Smirnov (K-S) Z test. All dependent and independent variables and sub-variables were tested for normality. If the significance level was more than 5 percent, normality was assumed (Bollen et. al. 2005).

Table (4.2) shows that all the independent and dependent variables and sub-variables are normally distributed.

Table (4.2): Normality Test: One-Sample Kolmogorov-Smirnov (Z) Test

Variables and Sub-variables	**(K-S)Z**	**Sig.**
Learning and Education	0.528	0.944
Experience and Expertise	0.818	0.515
Innovation and Creation	0.485	0.973
Human Capital	0.479	0.976
Systems and Programs	0.665	0.769
Research and Development	0.594	0.872
Intellectual Property Rights	0.709	0.696
Structural Capital	0.371	0.999
Alliances, Licensing and Agreements	0.510	0.957
Relations with Partners, Suppliers and Customers	0.582	0.887
Knowledge about Partners, Suppliers and Customers	0.584	0.885
Relational Capital	0.528	0.943
Intellectual Capital	0.577	0.893
Business Performance	0.393	0.998

2. Reliability Test (Cronbach's Alpha):

Reliability test was used also to test the consistency and suitability of the measuring tools. The reliability was evident by strong Cronbach's alpha coefficients of internal consistency.

If Alpha Coefficients were above 0.80, they were considered high, and if they were above 0.75, they were accepted, while if they were below 0.60, then results indicated weak internal inconsistency (Bollen et. al. 2005), while Bontis (2001) states that Alpha coefficients above 0.7 are accepted.

Table (4.3): Cronbach's Alpha for Pilot and Research Studies:

Variable and Sub-variable	**Pilot**	**Research**
Learning and education	**0.75**	0.79
Experience and Expertise	0.79	0.78
Innovation and Creation	0.89	0.86
Human Capital	0.93	0.92
Systems and Programs	0.84	0.87
Research & development	0.89	0.89
Intellectual Property Rights	0.90	0.92
Structural Capital	0.91	0.93
Alliances, Licensing and Agreements	0.73	0.89
Relationship with Partners, Suppliers and customers	0.82	0.87
Knowledge about Partners, Suppliers and customers	0.86	0.85
Relational Capital	0.90	0.93
Intellectual Capital	0.97	0.97
Business Performance	0.95	0.90

As shown in table (4.3), the results of Cronbach's alpha for both the pilot study and survey were registered acceptable according to Cronbach's Alpha reliability Coefficients; however, for the pilot study Cronbach's Alpha results were between 0.75 and 0.95, while Cronbach's Alpha for the survey results were between 0.78 and 0.90.

Thereby, these results could indicate high statistical reliability of the questionnaire, which might explain that the intellectual capital questionnaire employed by the study measured what the researcher expected to measure. The above result matches with previous studies, such as; Miller et. al. (1999), Moslhi et. al. (2006) and Bin Ismail (2005).

3. Validity:

Validity means to what extent the research items measure what it is supposed to measure (Haar & Sundelin P.19). Two methods were used to confirm content validity (construct validity): First, multiple sources of data (literature, expert interviews, panel of judges, and pilot study) were used to develop and refine the model and measures. Then, factor analysis was carried out for all items included in the questionnaire.

Factor Analysis (Principal Component Analysis):

Factor analysis was used to measure the validity of each item (loading) within its sub-variable and how each sub-variable is loaded within each variable. Pearson's Principal Component Factor Analysis was conducted with and without rotation (Varimax rotation with Kaiser Normalization).

The factor loading value below 0.4 should be removed. All variable and sub-variable items were valid, since their factor loading values were more than 0.4 as shown in the following tables. This result matches with previous studies, such; as Bontis (2001), Bollen et. al. (2005) and Bin Ismail (2005).

Intellectual Capital Variables: Table (4.4) shows that all the intellectual capital variables are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.4): Factors Loading for Intellectual Capital Variables

Intellectual Capital Variables	**Extraction**	**Factor 1**
Human Capital Variable	0.775	0.880
Structural Capital Variable	0.784	0.885
Relational Capital Variable	0.805	0.897

1. **Human Capital Sub-variables:** Table (4.5) shows that all the human capital sub-variables are valid, since their factor loading values were more than 0.4 for both indicators.

Table (4.5): Factors Loading for Human Capital Sub-variables

Human Capital Sub-variables	**Extracti**	**Factor 1**
Learning and Education	0.793	0.891
Experience and Expertise	0.827	0.909
Innovation and Creation	0.819	0.905

1.1. Learning and Education (L&E) Sub-variable: Table (4.6) shows that all the learning and education sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.6): Factors Loading for Learning and Education Sub-variable Items

Learning & Education Sub-variable Items	**Without Rotation**	**With Rotation**
Employee's competence	0.514	0.634
Co-operation & team tasks	0.623	0.500
Continuous training	0.647	0.775
Continuous learning from each others	0.656	0.638
Education average	**0.433**	0.604
Employee's knowledge & skills development	0.631	0.813
Market share improvement	0.562	**0.408**
L&E affect productivity	0.665	0.867
L&E affect profitability	0.681	0.906
L&E affect market valuation	**0.461**	0.819

1.2. Experience and Expertise (E&E) Sub-variable: Table (4.7) shows that all the experience and expertise sub-variable items are valid, since their factor loading values were more than 0.4 in both indicators.

Table (4.7): Factor Loading for Experience and Expertise Sub-variable Items

Experience & Expertise Sub-variable Items	**Without Rotation**	**With Rotation**
Employees are expert in their area	0.761	0.825
Consistently perform at best	0.629	0.699
Give it all they have to make it different	0.759	0.750
Employees' turn over	0.518	0.667
Company efficiency	0.671	0.642
Staff professionalism	0.767	0.782
Lowest cost/transaction	0.888	0.923
E&E affect productivity	0.666	0.834
E&E affect profitability	0.636	0.858
E&E affect market valuation	0.720	0.820

1.3. Innovation and Creation (I&C) Sub-variable: Table (4.8) shows that all the innovation and creation sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.8): Factor Loading for Innovation and Creation Sub-variable Items

Innovation & Creation Sub-variable Items	**Without Rotation**	**With Rotation**
Employees are creative & bright	0.665	0.697
Voice their opinion	0.711	0.717
Come up with new ideas	0.717	0.784
Number of new products launched	0.532	0.621

Encourage to bring new ideas	0.789	0.824
Employee satisfaction with innovation policies & programs	0.809	0.795
Motivation & commitment to share new ideas	0.762	0.755
I&C affect productivity	0.696	0.905
I&C affect profitability	0.722	0.922
I&C affect market valuation	0.751	0.861

2. Structural Capital Sub-variables: Table (4.9) shows that all the structural capital sub-variables are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.9): Factors Loading for Structural Capital Sub-variables:

Structural Capital Sub-variables	**Extraction**	**Factor 1**
Systems and Programs	0.661	0.813
Research and Development	0.797	0.893
Intellectual Property Rights	0.543	0.737

2.1. Systems and Programs (S&P) Sub-variable: Table (4.10) shows that all the systems and programs sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.10): Factor Loading for Systems and Programs Sub-variable items

Systems & Programs Sub-variable Items	**Without Rotation**	**With Rotation**
Succession training programs	0.686	0.729
Culture atmosphere supportive & comfortable	0.714	0.781
Comprehensive recruitment programs	0.795	0.804
Reward system related to performance	0.709	0.787
Upgrading skills & education support	0.841	0.833
Employees influence over decisions	0.724	0.675
Not bureaucratic nightmare	0.672	0.712
S&P affect productivity	0.731	0.900
S&P affect profitability	0.757	0.934
S&P affect market valuation	0.756	0.886

2.2. Research and Development (R&D) Sub-variable: Table (4.11) shows that all the research and development sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.11): Factor Loading for Research and Development Sub-variable Items

Research & Development Sub-variable Items	**Without Rotation**	**With Rotation**
Research leader	0.802	0.840
Continuous development of work processes	0.801	0.855
Continuously develops and Re-organizes itself	0.708	0.750
Follow up & adopt latest scientific & technical development	0.773	0.807
Systems & programs support innovation	0.712	0.791
Appropriate & adequate R&D budget	0.775	0.762
Board trust & support R&D	0.797	0.730
R&D affect Productivity	0.706	0.925
R&D affect profitability	0.743	0.949
R&D affect market valuation	0.789	0.933

2.3. Intellectual Property Rights (IPRs) Sub-variable: Table (4.12) shows that all the intellectual property rights sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.12): Factor Loading for Intellectual Property Rights Sub-variable Items

Intellectual Property Rights Sub-variable Items	**Without Rotation**	**With Rotation**
Sets clear IPRs strategies & procedures	0.803	0.818

Monitors IPRs portfolio	0.794	0.755
Pursues a multiple strategy of licensing IPRs	0.805	0.807
Encourage & reward creation	0.844	0.873
IPRs considered for value creation	0.816	0.871
Maximum utilization of IPRs to maximum level	0.815	0.821
High no. of IPRs	0.717	0.738
IPRs affect productivity	0.714	0.919
IPRs affect profitability	0.699	0.943
IPRs affect market valuation	0.717	0.926

3. Relational Capital Sub-variables: Table (4.13) shows that all the relational capital sub-variables are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.13): Factors Loading for Relational Capital Sub-variables

Relational Capital Sub-variables	**Extraction**	**Factor 1**
Alliances, Licensing & Agreements	0.547	0.740
Relations with Partners, Suppliers & Customers	0.776	0.881
Knowledge about Partners, Suppliers & Customers	0.776	0.881

3.1. Alliances, Licensing and Agreements (ALA) Sub-variable: Table (4.14) shows that all the alliances, licensing and agreements sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.14): Factor Loading for Alliances, Licensing and Agreements Sub-variable Items

Alliances, Licensing & Agreements Sub-variable Items	**Without Rotation**	**With Rotation**
Working with joint projects	0.752	0.737
Diverse distribution channels	0.687	0.746
High ratio of business with strategic alliances	0.787	0.863
Many and diverse alliances	0.791	0.805
Outside decision making consultations	0.554	0.639
Able to learn & add value through partners	0.686	0.648
Partnership orientation	0.854	0.802
ALA affect productivity	0.713	0.857
ALA affect profitability	0.698	0.913
ALA affect market valuation	0.754	0.916

3.2. Relations with Partners, Suppliers and Customers (R.PSC) Sub-variable: Table (4.15) shows that all the relations with partners, suppliers and customers' sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.15): Factor Loading for Relations with Partners, Suppliers and Customers Sub-variable Items

Relations with Partners, Suppliers & Customers Sub-variable Items	**Without Rotation**	**With Rotation**
Customers' loyalty & satisfaction	0.768	0.803
Customers' increasingly select company's products	0.780	0.809

Capitalization on customers' wants & needs	0.823	0.823
Devoting considerable time to select suppliers	0.759	0.703
Maintaining long standing relationship with suppliers	0.720	0.738
Reduce the time to solve customers' problems	0.527	0.620
Customer will continue to do the business with company	0.807	0.842
R.PSC affect productivity	0.721	0.910
R.PSC affect profitability	0.696	0.902
R.PSC affect market valuation	0.764	0.860

3.3. Knowledge about Partners, Suppliers and Customers (K.PSC) Sub-variable: Table (4.16) shows that all the knowledge about partners, suppliers and customers' sub-variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.16): Factor Loading for Knowledge about Partners, Suppliers and Customers Sub-variable Items

Knowledge about Partners, Suppliers & Customers Sub-variables	**Without Rotation**	**With Rotation**
Knowledge sharing with partners	0.610	0.688
Feedback from customers	0.699	0.785
Customer knowledge is widely distributed	0.698	0.779
Customer data continuously updated	0.815	0.862

Complete data about suppliers	0.717	0.679
Continuously meets with customers to find needs	0.711	0.691
Useful & updated information system	0.736	0.693
K.PSC affect productivity	0.699	0.898
K.PSC affect profitability	0.737	0.917
K.PSC affect market valuation	0.767	0.874

4. Business Performance (BP) Variable: Table (4.17) shows that all the business performance variable items are valid, since their factor loading values were more than 0.4 in both analyses.

Table (4.17): Factor Loading for Business Performance Indicators

Business Performance Indicators	**Without Rotation**	**With Rotation**
Industry leadership	0.679	0.810
Future outlook	0.649	0.783
Overall response to competition	0.696	0.729
Success rate in new launches	0.783	0.648
Overall business performance and success	0.822	0.598
Employee productivity	0.625	0.585
Process (transaction) productivity	0.676	0.604
Sales growth	0.796	0.890
Profit growth	0.806	0.893
Company market valuation (stock value)	0.741	0.822

Bivariate Pearson's Correlation Coefficient:

A Bivariate Pearson correlation coefficient was carried out to test the correlation between intellectual capital variables (sub-variables) and JPM Organizations' business performance for pilot and research studies. The table (4.18) shows that in both studies the intellectual capital variables and sub-variables significantly and strongly related to JPM Organizations' business performance.

Table (4.18): Bivariate Pearson's Correlation Coefficient between Intellectual Capital Variables (Sub-variables) and Business Performance for Pilot and Research Studies

Variables and Sub-variables	**Pilot**	**Research**
Learning and education	0.716**	0.564**
Experience and Expertise	0.712**	0.534**
Innovation and Creation	0.773**	0.641**
Human Capital	0.795**	0.647**
Systems and Programs	0.726**	0.589**
Research & development	0.870**	0.550**
Intellectual Property Rights	**0.267***	**0.258****
Structural Capital	0.802**	0.557**
Alliances, Licensing and Agreements	**0.461***	**0.375****
Relationship with Partners, Suppliers and customers	0.889**	0.729**
Knowledge about Partners, Suppliers and customers	0.783**	0.609**
Relational Capital	0.845**	0.670**

Intellectual Capital	0.848**	0.698**
Business Performance		

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level

4.8. Organizations and Respondents Description: Jordanian Pharmaceutical Manufacturing (JPM) Industry:

All JPM Organizations are generic organizations and are completely dependent on importing raw materials. The JPM Organizations are still focusing on developing new formulas for already existing patented products (generics) in standard therapeutic areas.

On April 11, 2000, Jordan became the 136th member of the World Trade Organization (WTO). Consequently**,** Jordan has to follow the Intellectual Property Rights (IPRs) rules and regulations. The WTO has opened the doors for the JPM Organizations to enter more markets such as Europe and the United States. The JPM Organizations need to comply with the highest international standards, in order to be approved by any European country. To comply also with Food and Drug Administration (FDA) standards, to be approved by the United States.

The Jordanian pharmaceutical manufacturing industry has been heavily weighted toward professional and technical staff. According to Hijjawi (2006),

the industry is employing 4,348 people; 55% of them are holding a high-level degrees (Diploma, B.Sc., M.A, M.Sc., and PhD). 39% of the total employees are females. About 26% of the total employees work in administration, 12% work in marketing and 62% running production departments. 181 employees work in Research and Development (R&D), (85% of them are holding university high degrees, and 15% are diploma holders).

The actual investment in the pharmaceuticals sector exceeds US$ 400 million, while the registered capital stands at US$ 225 million. The total sales reached US$ 248.9 million in 2004. Exports represent 74.9% (US$ 186.5 million) of total sales. The JPM Organizations met only 22.6% (US$ 62.4 million) of the value of local market (US$ 276.5 million). While in 2005, the total exports reached US$ 280.3 million, representing 7.7% of the total Jordanian exports (the second rank of Jordanian exports) and exceeding pharmaceutical products imports, which reached US$ 214.1 million. The pharmaceutical sector in Jordan exports its products to more than 60 countries. The majority of JPM Organizations have strategic alliances and licensing agreements with a number of leading international organizations including Fujisawa, Roche, Takeda, and others. Moreover, they have also managed to register their products on a global scale, especially in Europe and the United States.

Organizations Involved in the Study:

The Jordanian Association of Pharmaceutical Manufacturers (JAPM) was established in 1996.

Now it includes fifteen (15) JPM Organizations: Eight of them are public shareholding organizations listed on Amman Stock Exchange (ASE) market, while the remaining seven are privately owned, as shown in table (4.19):

Table (4.19): Jordanian Pharmaceutical Manufacturing Organizations (JAPM) Members (2006)

No.	Company Name	Esta. Year	Merg. Year	Type
1	Arab Pharmaceuticals Manufacturing Company Ltd., merged with Advanced Pharmaceutical Industries (APM).	1962	2004	Public
2	Dar Al-Dawa Development and Investment Company (DAD)	1975		Public
3	Hikma Pharmaceuticals (HIKMA)	1977		Public
4	Jordanian Pharmaceutical Manufacturing Company. Merged with Al-Razi Pharmaceutical Industries Company (JPM).	1978	2004	Public
5	Arab Center for Pharmaceuticals and Chemicals (ACPC).	1983		Public
6	United Pharmaceuticals (UPM).	1989		Private
7	Amman Pharmaceutical Industries Company (API).	1989		Private

8	Ram Pharmaceutical Manufacturing Company (RAM).	1992		Private
9	Hayat Pharmaceutical Industries	1993		Public
10	Philadelphia Pharmaceutical Industries Company (PHILAD)	1993		Public
11	Middle East Pharmaceuticals Manufacturing Company (MIDPHARMA)	1993		Public
12	Pharma International (INTER)	1994		Private
13	Jordan Sweden Medical & Sterilization Company (JOSWE)	1996		Private
14	Al-Kindi Pharmaceutical Industries Company (KINDI)	1997		Private
15	Jordan River Pharmaceutical Industries (JORIVER)	1999		Private

Source: Hijjawi (2006): The Jordanian Association of Pharmaceutical Manufacturers (JAPM) Data Bank.

Respondents Demographic Description:

Through this section, the general characteristics of the respondents will be discussed in terms of gender, age, education level, experience, department and sector. See table (4.20).

Gender: The proportion of male respondents was 92 (70.5%) higher than female 40 (29.5%).

This indicates that the majority of managers in Jordanian pharmaceutical industry are males, because females might not continue working for longer period as much as males and Jordanian society is almost masculine society.

Sector: The respondents' proportion range between public and private organizations as follows: 65 (49.2%) of respondents were from public organizations, while 67 (50.8%) were from private organizations. Such distribution reflects the suitable proportion between the two sectors: eight public organizations and seven private organizations.

Age: The majority of the respondents age between 40 to 49 years old 58 (51.51%), followed by 43 (32.6%) lies between 30 to 39 years old, then 18 (13.6%) above 50 years old. While 3 (2.3 %) are young managers (less than 30 years old). This indicates that the majority of respondents are mature managers, and the pharmaceutical industry prefers to appoint people between 30 years old to 50 years old as managers.

Education: The majority of the respondents were B.Sc. holders 86 (65.2%). While, the others were either Master holders 31 (23.5%) or Ph.D. 15 (11.4%). This indicates that the Jordanian pharmaceutical industry is heavily weighted toward professional and technical staff.

Experience: The majority of the respondents 79 (59.8%) had experience between 10 to 19 years. While 24 (18.2%) had experience between 20-29 years and 5 (3.8%) had experience of more than 30 years. Only 24 (18.2%)

had experience of less than 10 years and are considered as junior managers, some of them were owners or shareholders relatives. This indicates that the JPM Organizations do not usually promote the employees to be managers before 10 years experience because the managers in pharmaceutical field need long years of experience to be able to manage.

Departments: The respondents were from different departments as follows: 55 (42%) from production department, 43 (33%) from administration department and 34 (26%) from marketing department. The researcher believes that the respondents represent all major departments, and the respondents' distribution is matching with actual proportion, as mentioned above.

Table (4.20): Respondents Characteristics (Demographic Data)

No.	Variable	Category	Frequen	Percent
1	Gender	Male	92	70%
		Female	40	30%
2	Sector	Public	65	49.2%
		Private	67	50.8%
3	Age	Less than 30	3	2.3%
		30-39	43	32.6%
		40-49	58	51.5%
		More than 50	18	13.6%
4	Education	B.Sc.	86	65.2%
		Master	31	23.5%
		Ph.D.	15	11.4%
5	Experienc	Less than 10	24	18.2%

		10-19	79	59.8%
		20-29	24	18.2%
		More than 30	5	3.8%
6	Departme nt	Administration	43	33%
		Production	55	42%
		Marketing Department	34	26%
	Total		132	

Chapter Five

Data Analysis and Results

This chapter presents research results regarding the use of performance measurement for intellectual capital at organizational level. In addition, the chapter taps to answer the research main question: “How does each intellectual capital element affect JPM Organizations’ business performance?”

The chapter has been divided into five sections. The first section deals with variables analysis and description. The second section describes demographic analysis related to all variables statistically. The third section presents the correlation among independent variables and sub-variables, then their correlation with dependent variable. The fourth section tests hypotheses via multiple-regressions, stepwise regression and sequential regression. The fifth section includes Partial Least Squares (PLS) and Path Analysis.

5.1. Section One: Study Variables Analysis

This section analyzes and describes the independent and dependent variables from statistical point of view including means, standard deviations, and t-values.

Intellectual Capital:

Table (5.1) shows that the average means of the respondents’ perception about the implementation of intellectual capital variables were ranging from 3.06 to 3.45, with standard deviation that ranges from (0.511 to 0.654).

Such results indicate that there is a varied agreement on the implementation of intellectual capital variables. The overall result indicates that there is a significant implementation of the intellectual capital among JPM Organizations, where (t=7.095 > 1.645).

Table (5.1): Mean, Standard Deviation and One-Sample T-Test Results for Independent Variables.

Intellectual Capital Variables	**Mean**	**Std. deviation**	**T value**	**T tabulated**
Human Capital	3.43	0.520	9.589	1.645
Structural Capital	3.06	0.654	1.034	1.645
Relational Capital	3.45	0.550	9.447	1.645
Intellectual Capital	**3.32**	**0.510**	**7.095**	**1.645**

1. Human Capital Sub-variables:

Table (5.2) shows that the average means of respondents' perception about the implementation of human capital sub-variables were ranging from 3.27 to 3.58, with standard deviation that ranges from (0.525 to 0.642). Such results indicate that there is an agreement among respondents on the implementation of the human capital sub-variables. The results indicate that there is a significant implementation of the human capital sub-variables, where (t=9.589 > 1.645).

Table (5.2): Mean, Standard Deviation and One-Sample T-Test Results for Human Capital Sub-variables.

Human Capital Variables	**Mean**	**Std. deviation**	**T value**	**T tabulated**
Learning and education	3.58	0.563	11.768	1.645
Experience and Expertise	3.45	0.525	9.906	1.645
Innovation and Creation	3.27	0.642	4.880	1.645
Human Capital	**3.43**	**0.520**	**9.589**	**1.645**

1.1. Learning and Education (L&E) Sub-variable Items:

Table (5.3) shows that the average means of respondents' perception about the implementation of learning and education sub-variable were ranging from 2.69 to 4.24, with standard deviation that ranges from (0.821 to 1.089). Such results indicate that there is a varied agreement on the implementation of learning and education sub-variable items. The result indicates that there is a significant implementation of the learning and education sub-variable, where (t=11.678 > 1.645).

The results also show that the respondents strongly agree that learning and education affect JPM Organizations' productivity and profitability, while they moderately agree that learning and education affect JPM Organizations' market valuation.

Table (5.3): Mean, Standard Deviation and One-Sample T-Test Results for Learning and Education Sub-variable Items.

No.	L&E Items	Mean	Std. Deviation	T value	T tabulated
1	Employees' competence	3.33	0.862	4.443	1.645
2	Co-operation & team tasks	4.24	0.821	17.392	1.645
3	Continuous training	2.69	1.078	**-3.310**	1.645
4	Continuous learning from each other	3.44	0.959	5.263	1.645
5	Education average	3.45	1.014	5.066	1.645
6	Employees' knowledge & skills development	2.86	0.987	**-1.588**	1.645
7	Market share improvement	3.63	1.022	7.069	1.645
8	L&E affect productivity	4.24	0.857	16.654	1.645
9	L&E affect profitability	4.14	0.917	14.325	1.645
10	L&E affect market valuation	3.74	1.089	7.836	1.645
	Mean total	**3.58**	**0.563**	**11.768**	**1.645**

1.2. Experience and Expertise (E&E) Sub-variable Items:

Table (5.4) shows that the average means of the respondents' perception about the implementation of experience and expertise sub-variable were ranging from 2.76 to 4.23, with standard deviation that ranges from (0.727 to 1.085).

Such results indicate that there is a varied agreement on the implementation of experience and expertise sub-variable items. The result indicates that there is a significant implementation of experience and expertise sub-variable, where (t=9.906 > 1.645). Results also show that the respondents strongly agree that experience and expertise affect JPM Organizations' productivity and profitability, while they moderately agree on that experience and expertise affect JPM Organizations' market valuation.

Table (5.4): Mean, Standard Deviation and One-Sample T-Test Results for Experience and Expertise Sub-variable Items

No.	E&E Items	Mean	Std. Deviation	T value	T tabulated
11	Employees' expert in their area	3.41	0.800	5.873	1.645
12	Consistently perform at best	3.27	0.770	3.955	1.645
13	Give it all they have to make it different	3.39	0.930	4.773	1.645
14	Employees' turn over	2.76	1.085	**-2.567**	1.645
15	Employees' efficiency	3.53	1.007	6.049	1.645
16	Staff professionalism	3.12	0.829	1.680	1.645
17	Lowest cost/transaction	2.97	1.011	**-0.344**	1.645
18	E&E affect productivity	4.23	0.727	19.403	1.645
19	E&E affect profitability	4.12	0.811	15.893	1.645

20	E&E affect market valuation	3.74	1.038	8.215	1.645
	Mean total	**3.45**	**0.525**	**9.906**	**1.645**

1.3. Innovation and Creation (I&C) Sub-variable Items:

Table (5.5) shows that the average means of the respondents' perception about the implementation of innovation and creation sub-variable were ranging from 2.60 to 4.00, with standard deviation that ranges from (0.810 to 1.082). Such results indicate that there is varied agreement on the implementation of the innovation and creation sub-variable items. The result indicates that there is a significant implementation of innovation and creation sub-variable, where (t=4.880 > 1.645). Results also show that the respondents strongly agree that innovation and creation affect JPM Organizations' productivity and profitability, while they moderately agree that innovation and creation affect JPM Organizations' market valuation.

Table (5.5): Mean, Standard Deviation and One-Sample T-Test Results for Innovation and Creation Sub-variable Items

No.	I&C Items	Mean	Std. Deviation	T value	T tabulated
21	Employees are creative & bright	3.29	0.852	3.883	1.645
22	Voice their opinion	3.27	1.033	2.950	1.645
23	Come up with new ideas	3.05	0.864	**0.605**	1.645

24	Number of new products launched	2.77	1.102	**-2.369**	1.645
25	Encourage to bring new ideas	3.13	1.014	**1.459**	1.645
26	Employees' satisfaction with innovation policies & programs	2.60	1.003	**-4.600**	1.645
27	Motivation & commitment to share new ideas	3.02	0.996	**0.175**	1.645
28	I&C affect productivity	4.00	0.810	14.180	1.645
29	I&C affect profitability	3.95	0.927	11.734	1.645
30	I&C affect market valuation	3.67	1.082	7.080	1.645
	Mean Total	**3.27**	**0.642**	**4.880**	**1.645**

2. Structural Capital Sub-variables:

Table (5.6) shows that the average means of the respondents' perception about the implementation of structural capital sub-variables were ranging from 2.80 to 3.20, with standard deviation that ranges from (0.688 to 0.910). Such results indicate that there is a varied agreement among respondents on the implementation of the structural capital sub-variables. The result indicates that there is low implementation of the structural capital sub-variables, where (t=1.034 < 1.645).

Table (5.6): Means, Standard Deviation and One-Sample T-Test Results for Structural Capital Sub-variables.

Structural Capital Variables	**Mean**	**Std. deviation**	**T value**	**T tabulated**
Systems and Programs	3.17	0.688	2.897	1.645
Research & development	3.20	0.809	2.905	1.645
Intellectual Property Rights	2.80	0.910	**-2.544**	1.645
Structural Capital	**3.06**	**0.654**	**1.034**	**1.645**

2.1. Systems and Programs (S&P) Sub-variable Items:

Table (5.7) shows that the average means of the respondents' perception about the implementation of systems and programs sub-variable were ranging from 2.39 to 3.95, with standard deviation that ranges from (0.894 to 1.129). Such results indicate that there is a varied agreement on the implementation of the systems and programs sub-variable items.

The result indicates that there is a significant implementation of systems and programs sub-variable, where (t=2.897 > 1.645). Results also show that the respondents moderately agree that systems and programs affect JPM Organizations' productivity, profitability and market valuation.

Table (5.7): Mean, Standard Deviation and One-Sample T-Test Results for Systems and Programs Sub-variable Items

No.	Statement	Mean	Std. Deviation	T value	T tabulated
31	Succession training programs	2.48	1.015	**-5.831**	1.645
32	Cultural atmosphere supportive & comfortable	3.11	1.089	**1.199**	1.645
33	Comprehensive recruitment programs	3.11	1.072	**1.137**	1.645
34	Reward system related to performance	2.39	1.103	**-6.393**	1.645
35	Upgrading skills & educational support	2.95	0.944	**-0.646**	1.645
36	Employees' influence over decisions	2.73	0.966	**-3.245**	1.645
37	Not bureaucratic nightmare	3.53	1.129	5.398	1.645
38	S&P affect productivity	3.95	0.894	12.174	1.645
39	S&P affect profitability	3.89	0.922	11.048	1.645
40	S&P affect market valuation	3.61	1.047	6.653	1.645
	Mean Total	**3.17**	**0.688**	**2.897**	**1.645**

2.2. Research and Development (R&D) Sub-variable Items:

Table (5.8) shows that the average means of respondents' perception about the implementation of research and development sub-variable were ranging from 2.77 to 3.90,

with standard deviation that ranges from (1.010 to 1.222). Such results indicate that there is a varied agreement on the implementation of the research and development sub-variable items. The result indicates that there is a significant implementation of the research and development sub-variable, where (t=2.905 > 1.645). Results also show that respondents moderately agree on that research and development affect JPM Organizations' productivity, profitability and market valuation.

Table (5.8): Mean, Standard Deviation and One-Sample T-Test Results for Research and Development Sub-variable Items

No.	**Statement**	**Mean**	**Std. Deviation**	**T value**	**T tabulated**
41	Research leader	2.77	1.203	**-2.242**	1.645
42	Continuous development of work processes	3.03	1.041	**0.335**	1.645
43	Continuously develops and Re-organizes itself	3.02	1.059	**0.247**	1.645
44	Follow up & adopt latest scientific & technical development.	2.90	1.010	**-1.120**	1.645

45	Systems & programs support innovation	2.86	1.085	**-1.524**	1.645
46	Appropriate & adequate R&D budget	2.83	1.160	**-1.650**	1.645
47	Board trust & support R&D	3.10	1.222	**0.926**	1.645
48	R&D affect productivity	3.90	1.132	9.154	1.645
49	R&D affect profitability	3.86	1.203	8.249	1.645
50	R&D affect market valuation	3.77	1.214	7.311	1.645
	Mean Total	**3.20**	**0.809**	**2.905**	**1.645**

2.3. Intellectual Property Rights (IPRs) Sub-variable Items:

Table (5.9) shows that the average means of the respondents' perception about the implementation of the intellectual property rights sub-variable were ranging from 2.14 to 3.22, with standard deviation that ranges from (1.126 to 1.315). This indicates that there is a varied agreement on the implementation of the intellectual property rights sub-variable items. The result indicates that there is no significant implementation of the intellectual property rights sub-variable, where (t=-2.544 < 1.645).

Results also show that respondents moderately agree on that intellectual property rights affect JPM Organizations' profitability and low agreement on that intellectual property rights affect JPM Organizations' productivity and market valuation.

Table (5.9): Mean, Standard Deviation and One-Sample T-Test Results for Intellectual Property Rights Sub-variable Items

No.	Statement	Mean	Std. Deviation	T value	T tabulated
51	Sets clear IPRs strategies & procedures	2.67	1.209	**-3.169**	**1.645**
52	Monitors IPRs portfolio	2.86	1.147	**-1.442**	1.645
53	Pursues a multiple strategy of licensing IPRs	2.81	1.127	**-1.931**	1.645
54	Encourage & reward creation	2.74	1.189	**-2.489**	1.645
55	IPRs considered for value creation	2.66	1.158	**-3.382**	1.645
56	Maximum utilization of IPRs to maximum level	2.58	1.126	**-4.252**	1.645
57	High no. of IPRs	2.14	1.153	**-8.528**	1.645
58	IPRs affect Productivity	3.15	1.293	**1.346**	1.645
59	IPRs affect profitability	3.22	1.315	1.919	1.645

60	IPRs affect market valuation	3.15	1.299	1.340	1.645
	Mean Total	**2.80**	**0.910**	**-2.544**	**1.645**

3. Relational Capital Sub-variables:

Table (5.10) shows that the average means of the respondents' perception about the implementation of the relational capital sub-variables were ranging from 3.37 to 3.59, with standard deviation that ranges from (0.612 to 0.752). Such results indicate that there is an agreement among responses on the implementation of the relational capital sub-variables. The result indicates that there is a significant implementation of the relational capital variables, where (t=9.447 > 1.645).

Table (5.10): Mean, Standard Deviation and One-Sample T-Test Results for Relational Capital Sub-variables.

Variable	**Mean**	**Std. deviation**	**T value**	**T tabulated**
Alliances, Licensing and Agreements	3.39	0.752	5.993	1.645
Relationship with Partners, Suppliers and customers	3.59	0.612	11.136	1.645
Knowledge about Partners, Suppliers and customers	3.37	0.622	6.870	1.645
Relational Capital	**3.45**	**0.550**	**9.447**	**1.645**

3.1Alliances, Licensing and Agreements Sub-variable Items:

Table (5.11) shows that the average means of the respondents' perception about the implementation of the alliances, licensing and agreements sub-variable were ranging from 3.06 to 3.86, with standard deviation that ranges from (0.957 to 1.164). Such results indicate that there is a varied agreement on the implementation of the alliances, licensing and agreements sub-variable items. The result indicates that there is a significant implementation of the alliances, licensing and agreements sub-variable, where (t=5.993 > 1.645). Results also show that respondents moderately agree that the alliances, licensing and agreements affect JPM Organizations' productivity, profitability and market valuation.

Table (5.11): Mean, Standard Deviation and One-Sample T-Test Results for Alliances, Licensing and Agreements Sub-variable Items

No.	Statement	Mean	Std. Deviation	T value	T tabulated
61	Working with joint projects	3.28	1.114	2.890	1.645
62	Diverse distribution channels	3.55	1.021	6.222	1.645
63	High ratio of business with strategic alliances	3.06	1.164	**0.598**	1.645
64	Many and diverse alliances	3.07	1.120	**0.699**	1.645

65	Outside decision making consultations	3.13	1.122	**1.319**	1.645
66	Able to learn & add value through partners	3.41	0.957	4.913	1.645
67	Partnership orientation	3.18	1.069	1.955	1.645
68	ALA affect productivity	3.75	0.984	8.760	1.645
69	ALA affect profitability	3.86	1.012	9.715	1.645
70	ALA affect market valuation	3.64	1.100	6.646	1.645
	Mean Total	**3.39**	**0.752**	**5.993**	**1.645**

3.1. Relations with Partners, Suppliers and Customers (R.PSC) Sub-variable Items:

Table (5.12) shows that the average means of the respondents' perception about the implementation of the relations with partners, suppliers and customers' sub-variable were ranging from 3.15 to 4.14, with standard deviation that ranges from (0.802 to 0.993). Such results indicate that there is an agreement on the implementation of the relations with partners, suppliers and customers' sub-variable items. The results indicate that there is a significant implementation of the relations with partners, suppliers and customers' sub-variable, where (t=11.136 > 1.645). Results also show that respondents strongly agree that the relations with partners, suppliers and customers affect JPM Organizations' productivity and profitability, but moderate affect market valuation.

Table (5.12): Mean, Standard Deviation and One-Sample T-Test Results for Relations with Partners, Suppliers & Customers Sub-variable Items

No.	Statement	Mean	Std. Deviation	T value	T tabulated
71	Customers' loyalty & satisfaction	3.31	0.909	3.925	1.645
72	Customers increasingly select company's products	3.29	0.993	3.332	1.645
73	Capitalization on customers' wants & needs	3.48	0.903	6.069	1.645
74	Devoting considerable time to select suppliers	3.39	0.889	5.092	1.645
75	Maintaining long standing relationship with suppliers	3.78	0.859	10.438	1.645
76	Reduce the time to solve customers' problems	3.15	0.977	1.782	1.645
77	Customer will continue to do the business with company	3.48	0.912	6.013	1.645
78	R.PSC affect productivity	4.07	0.803	15.291	1.645

79	R.PSC profitability	4.14	0.802	16.387	1.645
80	R.PSC market valuation	3.84	0.923	10.465	1.645
	Mean Total	**3.59**	**0.612**	**11.136**	**1.645**

3.3 Knowledge about Partners, Suppliers and Customers (K.PSC) Sub-variable Items:

Table (5.13) shows that the average means of the respondents' perception about the implementation of the knowledge about partners, suppliers and customers' sub-variable were ranging from 2.89 to 3.89, with standard deviation that ranges from (0.841 to 1.057). Such results indicate that there is a varied agreement on the implementation of the knowledge about partners, suppliers and customers' sub-variable items. The result indicates that there is a significant implementation of the knowledge about partners, suppliers and customers' sub-variable, where (t=6.870 > 1.645). Results also show that respondents moderately agree on that knowledge about partners, suppliers and customers affect JPM Organizations' productivity, profitability and market valuation.

Table (5.13): Mean, Standard Deviation and One-Sample T-Test Results for Knowledge about Partners, Suppliers & Customers Sub-variable Items

No.	Statement	Mean	Std. Deviation	T value	T tabulated
81	Knowledge sharing with partners	3.19	1.042	2.088	1.645
82	Feedback from customers	3.32	0.935	3.908	1.645
83	Customer's knowledge is widely distributed	2.89	0.902	**-1.351**	1.645
84	Customer's data continuously updated	3.17	0.904	2.215	1.645
85	Complete data about suppliers	3.45	0.841	6.107	1.645
86	Continuously meets with customers to find needs	3.23	0.995	2.711	1.645
87	Useful & updated information system	3.07	1.057	**0.741**	1.645
88	K.PSC affect productivity	3.87	0.868	11.525	1.645
89	K.PSC affect profitability	3.89	0.867	11.843	1.645
90	K.PSC affect market valuation	3.63	1.037	6.968	1.645
	Mean Total	**3.37**	**0.622**	**6.870**	**1.645**

Dependent Variable (Business Performance Indicators (BP)):

Table (5.14) shows that the average means of the respondents' perception about the role of business performance indicators were ranging from 3.30 to 3.95, with standard deviation

that ranges from (0.785 to 0.946). Such results indicate that there is an agreement on the role of business performance indicators. The result indicates that there is a significant role of business performance indicators, where (t=8.173 > 1.645).

Table (5.14): Mean, Standard Deviation and One-Sample T-Test Results for Business Performance Indicators

No.	Statement	Mean	Std. Deviation	T value	T tabulated
91	Industry leadership	3.48	0.886	6.186	1.645
92	Future outlook	3.95	0.927	11.734	1.645
93	Overall response to competition	3.39	0.889	5.092	1.645
94	Success rate in new product launches	3.30	0.931	3.647	1.645
95	Overall business performance and success	3.54	0.833	7.422	1.645
96	Employee productivity	3.37	0.785	5.430	1.645
97	Process (transaction) productivity	3.38	0.737	5.909	1.645
98	Sales growth	3.39	0.946	4.691	1.645
99	Profit growth	3.45	0.944	5.442	1.645
100	Company market valuation (stock value)	3.33	0.904	4.141	1.645
	Mean Total Performance	**3.46**	**0.641**	**8.173**	**1.645**

5.2. Section Two: Demographic Analysis

T-Test for Independent and Dependent Variables against Gender: Table (5.15) shows that there was no significant difference between the means of both genders regarding their perception about implementing intellectual capital sub-variables (Appendix 6 shows the gender proportion in JPM Organizations). However, males' responses have registered higher means than females' responses regarding most sub-variables. Accordingly, this means that male managers perceive higher level of presence of intellectual capital in JPM Organizations than female managers do. Moreover, there was no significant difference related to business performance indicators between both genders.

Table (5.15): T-Test Results for Independent and Dependent Variables Against Genders

Independent and Dependent Variables	Mean/Gender		t-test for Equality of Means				
	Male 92	Female 40	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Learning & Education	3.600	3.525	-0.701	130	0.484	-0.075	0.107
Experience & Expertise	3.490	3.368	-1.236	130	0.219	-0.123	0.099
Innovation & Creation	3.328	3.145	-1.515	130	0.132	-0.183	0.121
Human Capital	3.473	3.346	-1.292	130	0.199	-0.127	0.098
Systems & Programs	3.228	3.048	-1.392	130	0.166	-0.181	0.130
R&D	3.192	3.233	0.261	130	0.795	0.040	0.154
IPRs	2.767	2.870	0.594	130	0.554	0.103	0.173
Structural Capital	3.063	3.050	-0.102	130	0.919	-0.013	0.124
Alliances,	3.373	3.438	0.452	130	0.652	0.065	0.143
Relations	3.582	3.620	0.331	130	0.741	0.038	0.116
Knowledge	3.334	3.460	1.073	130	0.285	0.126	0.118
Relational Capital	3.429	3.506	0.732	130	0.465	0.076	0.104
Intellectual Capital	3.322	3.301	-0.217	130	0.829	-0.021	0.097
Business Performance	3.463	3.440	-0.189	130	0.850	-0.023	0.122

* Significant at 0.05 level (2-tailed)

T-Test for Independent and Ddependent Variables against Sector: Table (5.16) shows that there was significant difference between the means of both public and private sectors regarding structural capital and experience and expertise sub-variable. Result shows that managers' perceptions working in public JPM Organizations regarding the implementation of intellectual capital items were higher than those of private organizations for most sub-variables, especially for structural capital variable, and experience and expertise sub-variable. While for dependent variable, there was no significant difference between public and private sector respondents. (Appendix 4 shows public and private JPM Organizations)

Table (5.16): T-Test Results for Independent and Dependent Variables Against Sector

Independent and Dependent Variables	**Mean/Sector**		**t-test for Equality of Means**				
	Public 65	Private 67	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Learning & Education	3.633	3.522	1.137	130	0.258	0.111	0.098
Experience & Expertise	**3.566**	**3.343**	2.484	130	**0.014***	0.223	0.090
Innovation & Creation	3.329	3.218	0.996	130	0.321	0.111	0.112
Human Capital	**3.510**	**3.361**	1.650	130	0.101	0.149	0.090
Systems & Programs	3.286	3.064	1.871	130	0.064	0.222	0.117
R&D	3.334	3.079	1.825	130	0.070	0.255	0.140
IPRs	2.914	2.687	1.440	130	0.152	0.227	0.158
Structural Capital	**3.178**	**2.943**	2.089	130	**0.039***	0.235	0.112
Alliances	3.492	3.296	1.510	130	0.134	0.197	0.130

*Significant at 0.05 level (2-tailed).

Relations	3.511	3.673	-1.532	130	0.128	-0.162	0.106
Knowledge	3.408	3.337	0.648	130	0.518	0.070	0.109
Relational Capital	3.470	3.435	0.363	130	0.717	0.035	0.096
Intellectual Capital	3.386	3.247	1.577	130	0.117	0.139	0.088
Business Performance	3.409	3.502	-0.826	130	0.411	-0.092	0.112

One-Way ANOVA Test for Independent and Dependent Variables against Age.

Table (5.17) shows that there were significant differences in the means among age groups, regarding implementation of intellectual capital items, where ($F=3.910$; $P < 0.05$). Table (5.18) results show that (after excluding the managers under 30 years old who rated highest mean, because they are only 3 managers) the managers over 50 years old rated highest means, followed by the managers' age between 40 to 49 years old, and finally the managers' age between 30 to 39 years old. It seems that managers with higher age perceive that JPM Organizations have a higher level of presence of intellectual capital than younger managers do. Whereas, there were no significant differences among age groups regarding to business performance indicators.

One-Way ANOVA Test for Independent and Dependent Variables against Qualifications (Education).

Table (5.19) shows that there were significant differences among qualification groups responses regarding the implementation of intellectual capital items, where (F=3.586; P < 0.05). It was obvious that there were clear differences among means of qualification groups regarding structural capital variable, where (F=4.729; P < 0.05). Table (5.20) shows

Table (5.17): One-Way ANOVA Test Results for Independent and Dependent Variables Against Age

Independent and Dependent Variables	**Age**	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Learning	Between Groups	2.139	3	0.713	2.312	0.079
	Within Groups	39.473	128	0.308		
	Total	41.612	131			
Experience	Between Groups	1.208	3	0.403	1.474	0.225
	Within Groups	34.961	128	0.273		
	Total	36.169	131			
Innovation	Between Groups	3.368	3	1.123	2.838	**0.041**
	Within Groups	50.634	128	0.396		

	Total	54.002	131			
Human Capital	Between Groups	2.115	3	0.705	2.704	**0.048**
	Within Groups	33.367	128	0.261		
	Total	35.482	131			
Systems	Between Groups	4.560	3	1.520	3.387	**0.020**
	Within Groups	57.437	128	0.449		
	Total	61.997	131			
R&D	Between Groups	5.598	3	1.866	2.980	**0.034**
	Within Groups	80.139	128	0.626		
	Total	85.737	131			
IPRs	Between Groups	6.430	3	2.143	2.687	**0.049**
	Within Groups	102.090	128	0.798		
	Total	108.520	131			
Structural Capital	Between Groups	4.850	3	1.617	4.049	**0.009**
	Within Groups	51.101	128	0.399		
	Total	55.951	131			
Alliances	Between Groups	2.873	3	0.958	1.720	0.166
	Within Groups	71.280	128	0.557		
	Total	74.152	131			
Relations	Between Groups	3.066	3	1.022	2.844	**0.040**

	Within Groups	45.997	128	0.359		
	Total	49.064	131			
Knowledge	Between Groups	2.391	3	0.797	2.112	0.102
	Within Groups	48.295	128	0.377		
	Total	50.686	131			
Relational Capital	Between Groups	2.276	3	0.759	2.596	0.055
	Within Groups	37.404	128	0.292		
	Total	39.680	131			
Intellectual Capital	Between Groups	2.866	3	0.955	3.910	**0.010**
	Within Groups	31.273	128	0.244		
	Total	34.139	131			
Business Performance	Between Groups	0.854	3	0.285	0.687	0.561
	Within Groups	52.992	128	0.414		
	Total	53.845	131			

Table (5.18): Respondents Descriptions According to Age.

Independent and Dependent Variables	Age	N	Mean	Std. Deviation	Std. Error
Learning	<30	3	3.900	0.557	0.321
	30-39	43	3.498	0.411	0.063
	40-49	68	3.538	0.578	0.070
	>50	18	3.861	0.743	0.175
Experience	<30	3	3.700	0.625	0.361
	30-39	43	3.398	0.456	0.070
	40-49	68	3.421	0.521	0.063
	>50	18	3.667	0.653	0.154
Innovation	<30	3	3.833	0.586	0.338
	30-39	43	**3.144**	0.581	0.089
	40-49	68	**3.249**	0.615	0.075
	>50	18	**3.578**	0.783	0.185
Human Capital	<30	3	3.811	0.587	0.339
	30-39	43	**3.347**	0.424	0.065
	40-49	68	**3.403**	0.512	0.062
	>50	18	**3.702**	0.666	0.157
Systems	<30	3	3.633	1.106	0.639
	30-39	43	**2.970**	0.638	0.097
	40-49	68	**3.191**	0.646	0.078
	>50	18	**3.517**	0.766	0.180
R&D	<30	3	3.767	0.874	0.504
	30-39	43	**3.049**	0.808	0.123
	40-49	68	**3.162**	0.776	0.094
	>50	18	**3.644**	0.799	0.188
IPRs	<30	3	2.433	1.358	0.784
	30-39	43	**2.642**	0.920	0.140
	40-49	68	**2.775**	0.850	0.103
	>50	18	**3.322**	0.920	0.217
Structural Capital	<30	3	3.278	0.550	0.318
	30-39	43	**2.887**	0.642	0.098
	40-49	68	**3.043**	0.610	0.074
	>50	18	**3.494**	0.698	0.165
Alliances	<30	3	3.667	0.709	0.410
	30-39	43	3.219	0.824	0.126
	40-49	68	3.419	0.699	0.085
	>50	18	3.661	0.727	0.171

Relations	<30	3	4.433	0.643	0.371
	30-39	43	**3.561**	0.593	0.090
	40-49	68	**3.528**	0.580	0.070
	>50	18	**3.778**	0.680	0.160
Knowledge	<30	3	3.633	0.351	0.203
	30-39	43	3.261	0.629	0.096
	40-49	68	3.352	0.566	0.069
	>50	18	3.672	0.767	0.181
Relational Capital	<30	3	3.911	0.560	0.323
	30-39	43	3.347	0.535	0.082
	40-49	68	3.433	0.521	0.063
	>50	18	3.704	0.620	0.146
Intellectual Capital	<30	3	3.667	0.513	0.296
	30-39	43	**3.193**	0.465	0.071
	40-49	68	**3.293**	0.486	0.059
	>50	18	**3.633**	0.587	0.138
Business Performance	<30	3	3.867	0.569	0.328
	30-39	43	3.435	0.638	0.097
	40-49	68	3.421	0.622	0.075
	>50	18	3.572	0.741	0.175

Table (5.19): One-Way ANOVA Test Results for Independent and Dependent Variables Against Education

Independent and Dependent Variables	Education	Sum of Squares	df	Mean Square	F	Sig.
Learning & Education	Between Groups	1.494	2	0.747	2.402	0.095
	Within Groups	40.118	129	0.311		
	Total	41.612	131			
Experience & Expertise	Between Groups	0.318	2	0.159	0.572	0.566
	Within Groups	35.851	129	0.278		
	Total	36.169	131			
Innovation & Creation	Between Groups	1.064	2	0.532	1.297	0.277
	Within Groups	52.937	129	0.410		
	Total	54.002	131			
Human Capital	Between Groups	0.865	2	0.432	1.611	0.204
	Within Groups	34.617	129	0.268		
	Total	35.482	131			
Systems & Programs	Between Groups	1.282	2	0.641	1.361	0.260
	Within Groups	60.716	129	0.471		
	Total	61.997	131			
R&D	Between Groups	7.022	2	3.511	5.754	**0.004**
	Within Groups	78.715	129	0.610		
	Total	85.737	131			
IPRs	Between Groups	4.871	2	2.435	3.031	0.052
	Within Groups	103.649	129	0.803		
	Total	108.520	131			
Structural Capital	Between Groups	3.822	2	1.911	4.729	**0.010**
	Within Groups	52.129	129	0.404		
	Total	55.951	131			
Alliances	Between Groups	3.058	2	1.529	2.774	0.066
	Within Groups	71.094	129	0.551		
	Total	74.152	131			
Relations	Between Groups	0.265	2	0.133	0.351	0.705
	Within Groups	48.798	129	0.378		
	Total	49.064	131			
Knowledge	Between Groups	2.095	2	1.048	2.781	0.066
	Within Groups	48.591	129	0.377		
	Total	50.686	131			
Relational Capital	Between Groups	1.408	2	0.704	2.373	0.097
	Within Groups	38.272	129	0.297		
	Total	39.680	131			
Intellectual Capital	Between Groups	1.798	2	0.899	3.586	**0.031**
	Within Groups	32.341	129	0.251		
	Total	34.139	131			
Business Performance	Between Groups	0.004	2	0.002	0.004	0.996
	Within Groups	53.842	129	0.417		
	Total	53.845	131			

Table (5.20): Respondents Descriptions According to Education.

Independent and Dependent Variables	Education	N	Mean	Std. Deviation	Std. Error
Learning & Education	B.Sc.	86	3.506	0.521	0.056
	Master	31	3.661	0.636	0.114
	Ph.D.	15	3.813	0.589	0.152
Experience & Expertise	B.Sc.	86	3.420	0.497	0.054
	Master	31	3.494	0.557	0.100
	Ph.D.	15	3.560	0.631	0.163
Innovation & Creation	B.Sc.	86	3.222	0.585	0.063
	Master	31	3.300	0.761	0.137
	Ph.D.	15	3.507	0.679	0.175
Human Capital	B.Sc.	86	3.383	0.474	0.051
	Master	31	3.485	0.604	0.108
	Ph.D.	15	3.627	0.572	0.148
Systems & Programs	B.Sc.	86	3.114	0.686	0.074
	Master	31	3.219	0.741	0.133
	Ph.D.	15	3.420	0.554	0.143
R&D	B.Sc.	86	**3.072**	0.796	0.086
	Master	31	**3.284**	0.795	0.143
	Ph.D.	15	**3.800**	0.646	0.167
IPRs	B.Sc.	86	2.662	0.840	0.091
	Master	31	3.003	0.930	0.167
	Ph.D.	15	3.160	1.127	0.291
Structural Capital	B.Sc.	86	**2.949**	0.629	0.068
	Master	31	**3.169**	0.608	0.109
	Ph.D.	15	**3.460**	0.731	0.189
Alliances	B.Sc.	86	3.281	0.772	0.083
	Master	31	3.613	0.694	0.125
	Ph.D.	15	3.573	0.657	0.170
Relations	B.Sc.	86	3.561	0.586	0.063
	Master	31	3.658	0.747	0.134
	Ph.D.	15	3.647	0.455	0.117
Knowledge	B.Sc.	86	3.292	0.596	0.064
	Master	31	3.448	0.649	0.116
	Ph.D.	15	3.673	0.643	0.166
Relational Capital	B.Sc.	86	3.378	0.537	0.056
	Master	31	3.573	0.572	0.103

	Ph.D.	15	3.631	0.528	0.136
Intellectual Capital	B.Sc.	86	**3.237**	0.476	0.051
	Master	31	**3.409**	0.542	0.097
	Ph.D.	15	**3.573**	0.552	0.143
Business Performance	B.Sc.	86	3.457	0.609	0.066
	Master	31	3.448	0.781	0.140
	Ph.D.	15	3.467	0.531	0.137

that Ph.D. holders rated higher means regarding intellectual capital variables, and then Master degree holders, and finally B.Sc. holders. Similar trend was noticed for structural capital. Therefore, it seems that the higher qualification holders perceive that JPM Organizations have a higher level of presence of intellectual capital than lower qualification holders do. (Appendix 5 shows the educational level in JPM Organizations).

One-Way ANOVA Test for Independent and Dependent Variables against Experience.

Table (5.21) shows that there were significant differences in the means among experience groups regarding the implementation of intellectual capital items, where ($F=4.129$, $P < 0.05$). Table (5.22), shows that the managers with experience more than 30 years rated higher means, then those with 20 to 29 years experience, followed by those with 10 to 19 years experience, and finally, those with less than 10 years experience, a similar trend was noticed for each intellectual capital variable. It seems that managers of longer experience perceive that JPM Organizations have higher level of presence of intellectual capital than managers of shorter experience do. The same trend is noticed for business performance indicators, but the results were not significant.

Table (5.21): One-Way ANOVA Test Results for Independent and Dependent Variables Against Experience

Independent and Dependent Variables	Experience	Sum of Squares	df	Mean Square	F	Sig.
Learning & Education	Between Groups	4.874	3	1.625	5.661	**0.001**
	Within Groups	36.738	128	0.287		
	Total	41.612	131			
Experience & Expertise	Between Groups	2.334	3	0.778	2.943	**0.036**
	Within Groups	33.835	128	0.264		
	Total	36.169	131			
Innovation & Creation	Between Groups	2.782	3	0.927	2.317	0.079
	Within Groups	51.220	128	0.400		
	Total	54.002	131			
Human Capital	Between Groups	3.177	3	1.059	4.196	**0.007**
	Within Groups	32.305	128	0.252		
	Total	35.482	131			
Systems & Programs	Between Groups	3.668	3	1.223	2.683	0.050
	Within Groups	58.329	128	0.456		
	Total	61.997	131			
R&D	Between Groups	2.894	3	0.965	1.491	0.220
	Within Groups	82.843	128	0.647		
	Total	85.737	131			
IPRs	Between Groups	5.461	3	1.820	2.261	0.084
	Within Groups	103.059	128	0.805		
	Total	108.520	131			
Structural Capital	Between Groups	3.569	3	1.190	2.907	**0.037**
	Within Groups	52.382	128	0.409		
	Total	55.951	131			
Alliances	Between Groups	5.019	3	1.673	3.097	**0.029**
	Within Groups	69.134	128	0.540		
	Total	74.152	131			
Relations	Between Groups	1.956	3	0.652	1.771	0.156
	Within Groups	47.108	128	0.368		
	Total	49.064	131			
Knowledge	Between Groups	4.403	3	1.468	4.059	0.009
	Within Groups	46.283	128	0.362		
	Total	50.686	131			

Relational Capital	Between Groups	3.454	3	1.151	4.068	**0.008**
	Within Groups	36.227	128	0.283		
	Total	39.680	131			
Intellectual Capital	Between Groups	3.012	3	1.004	4.129	**0.008**
	Within Groups	31.127	128	0.243		
	Total	34.139	131			
Business Performance	Between Groups	1.555	3	0.518	1.269	0.288
	Within Groups	52.290	128	0.409		
	Total	53.845	131			

Table (5.22): Respondents Descriptions According to Experience.

Independent and Dependent Variables	Experience	N	Mean	Std. Deviation	Std. Error
Learning & Education	<10	24	**3.567**	0.429	0.088
	10-19	79	**3.523**	0.562	0.063
	20-29	24	**3.567**	0.569	0.116
	<30	5	**4.540**	0.336	0.150
Experience & Expertise	<10	24	**3.467**	0.505	0.103
	10-19	79	**3.392**	0.517	0.058
	20-29	24	**3.508**	0.470	0.096
	<30	5	**4.080**	0.719	0.322
Innovation & Creation	<10	24	3.304	0.631	0.129
	10-19	79	3.200	0.628	0.071
	20-29	24	3.342	0.594	0.121
	<30	5	3.940	0.891	0.398
Human Capital	<10	24	**3.446**	0.476	0.097
	10-19	79	**3.372**	0.507	0.057
	20-29	24	**3.472**	0.489	0.100
	<30	5	**4.187**	0.622	0.278
Systems & Programs	<10	24	3.121	0.825	0.168
	10-19	79	3.099	0.588	0.066
	20-29	24	3.321	0.768	0.157
	<30	5	3.900	0.725	0.324
R&D	<10	24	3.079	0.816	0.166
	10-19	79	3.148	0.798	0.090
	20-29	24	3.413	0.826	0.169
	<30	5	3.700	0.745	0.333
IPRs	<10	24	2.525	0.934	0.191
	10-19	79	2.754	0.879	0.099
	20-29	24	3.129	0.879	0.179
	<30	5	3.220	1.126	0.503
Structural Capital	<10	24	**2.908**	0.633	0.129
	10-19	79	**3.000**	0.610	0.069
	20-29	24	**3.288**	0.740	0.151
	<30	5	**3.607**	0.617	0.276
Alliances	<10	24	**3.192**	0.879	0.179
	10-19	79	**3.352**	0.728	0.082
	20-29	24	**3.558**	0.611	0.125
	<30	5	**4.200**	0.604	0.270
Relations	<10	24	3.533	0.659	0.134
	10-19	79	3.581	0.593	0.067
	20-29	24	3.567	0.596	0.122
	<30	5	4.200	0.620	0.277
Knowledge	<10	24	3.142	0.596	0.122
	10-19	79	3.367	0.592	0.067
	20-29	24	3.458	0.657	0.134
	<30	5	4.140	0.456	0.204

Relational Capital	<10	24	**3.290**	0.580	0.118
	10-19	79	**3.433**	0.534	0.060
	20-29	24	**3.528**	0.493	0.101
	<30	5	**4.180**	0.413	0.185
Intellectual Capital	<10	24	**3.214**	0.508	0.104
	10-19	79	**3.269**	0.484	0.054
	20-29	24	**3.429**	0.518	0.106
	<30	5	**3.991**	0.442	0.198
Business Performance	<10	24	3.371	0.722	0.147
	10-19	79	3.454	0.622	0.070
	20-29	24	3.438	0.604	0.123
	<30	5	3.980	0.661	0.296

One-Way ANOVA Test for Independent and Dependent Variables against Departments.

Table (5.23) shows that there were significant differences in the means among department groups regarding implementation of intellectual capital items, where ($F=4.502$, $P < 0.05$), especially for structural capital and relational capital variables. Table (5.24) shows that administration department managers rated higher means regarding almost all variables and sub-variables, followed by production department managers, then marketing department managers. It seems that those who are working in administration department perceive that JPM Organizations have higher level of presence of intellectual capital than those in production and marketing departments, respectively. The same trend was noticed for business performance indicators, but the results were not significant.

Table (5.23): One-Way ANOVA Test Results for Independent and Dependent Variables Against Department

Independent and Dependent Variables	Department	Sum of Squares	df	Mean Square	F	Sig.
Learning & Education	Between Groups	2.469	2	1.235	4.069	**0.019**
	Within Groups	39.143	129	0.303		
	Total	41.612	131			
Experience & Expertise	Between Groups	1.179	2	0.590	2.174	0.118
	Within Groups	34.990	129	0.271		
	Total	36.169	131			
Innovation & Creation	Between Groups	1.275	2	0.637	1.560	0.214
	Within Groups	52.727	129	0.409		
	Total	54.002	131			
Human Capital	Between Groups	1.507	2	0.753	2.860	0.061
	Within Groups	33.976	129	0.263		
	Total	35.482	131			
Systems & Programs	Between Groups	3.166	2	1.583	3.471	**0.034**
	Within Groups	58.831	129	0.456		
	Total	61.997	131			
R&D	Between Groups	4.105	2	2.053	3.244	**0.042**
	Within Groups	81.632	129	0.633		
	Total	85.737	131			
IPRs	Between Groups	4.225	2	2.112	2.613	0.077
	Within Groups	104.295	129	0.808		
	Total	108.520	131			
Structural Capital	Between Groups	3.809	2	1.905	4.712	**0.011**
	Within Groups	52.142	129	0.404		
	Total	55.951	131			
Alliances	Between Groups	4.450	2	2.225	4.118	**0.018**
	Within Groups	69.702	129	0.540		
	Total	74.152	131			

Relations	Between Groups	1.834	2	0.917	2.505	0.086
	Within Groups	47.230	129	0.366		
	Total	49.064	131			
Knowledge	Between Groups	0.474	2	0.237	0.609	0.546
	Within Groups	50.213	129	0.389		
	Total	50.686	131			
Relational Capital	Between Groups	1.811	2	0.905	3.084	**0.049**
	Within Groups	37.869	129	0.294		
	Total	39.680	131			
Intellectual Capital	Between Groups	2.227	2	1.114	4.502	**0.013**
	Within Groups	31.912	129	0.247		
	Total	34.139	131			
Business Performance	Between Groups	0.288	2	0.144	0.347	0.707
	Within Groups	53.557	129	0.415		
	Total	53.845	131			

Table (5.24): Respondents Descriptions According to Department.

Independent and Dependent Variables	Department	N	Mean	Std. Deviation	Std. Error
Learning & Education	Administration	43	**3.751**	0.667	0.102
	Production	55	**3.555**	0.438	0.059
	Marketing	34	**3.394**	0.557	0.095
Experience & Expertise	Administration	43	3.588	0.605	0.092
	Production	55	3.396	0.462	0.062
	Marketing	34	3.374	0.495	0.085
Innovation & Creation	Administration	43	3.414	0.694	0.106
	Production	55	3.200	0.568	0.077
	Marketing	34	3.219	0.675	0.116
Human Capital	Administration	43	3.585	0.603	0.092
	Production	55	3.384	0.435	0.059
	Marketing	34	3.327	0.507	0.087
Systems and Programs	Administration	43	**3.395**	0.762	0.116
	Production	55	**3.080**	0.552	0.074
	Marketing	34	**3.044**	0.738	0.127
R&D	Administration	43	**3.458**	0.786	0.120
	Production	55	**3.087**	0.708	0.095
	Marketing	34	**3.074**	0.932	0.160

IPRs	Administration	43	3.056	0.946	0.144
	Production	55	2.671	0.916	0.124
	Marketing	34	2.679	0.804	0.138
Structural Capital	Administration	43	**3.303**	0.698	0.107
	Production	55	**2.946**	0.589	0.079
	Marketing	34	**2.932**	0.626	0.107
Alliances	Administration	43	**3.640**	0.634	0.097
	Production	55	**3.211**	0.858	0.116
	Marketing	34	**3.374**	0.628	0.108
Relations	Administration	43	3.761	0.596	0.091
	Production	55	3.531	0.586	0.079
	Marketing	34	3.482	0.646	0.111
Knowledge	Administration	43	3.456	0.676	0.103
	Production	55	3.318	0.554	0.075
	Marketing	34	3.353	0.662	0.113
Relational Capital	Administration	43	**3.619**	0.511	0.078
	Production	55	**3.353**	0.567	0.076
	Marketing	34	**3.403**	0.538	0.092
Intellectual Capital	Administration	43	**3.502**	0.532	0.081
	Production	55	**3.228**	0.472	0.064
	Marketing	34	**3.221**	0.492	0.084
Business Performance	Administration	43	3.523	0.670	0.102
	Production	55	3.426	0.590	0.080
	Marketing	34	3.421	0.694	0.119

5.3. Section Three: Relationships between the Study Variables:

Before testing the hypotheses, Pearson correlation (r) was carried out to test the correlation among the responses of intellectual capital variables and sub-variables, then between them and business performance indicators.

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	L&E													
2	E&E	**.712***												
3	I&C	**.701***	**.745***											
4	**HC**	.889*	.900*	.915*										
5	S&P	.636*	.586*	.753*	.737*									
6	R&D	.546*	.498*	.579*	.603*	**.631***								
7	IPR	.282*	.313*	.291*	.327*	**.339***	**.517***							
8	**SC**	.579*	.557*	.638*	**.659***	.769*	.874*	.796*						

Table (5.25): Pearson's Correlation (r) Among Independent Variables, Sub-variables and With Dependent Variable

9	ALA	.419*	.362*	.418*	.445*	.419*	.498*	.458*	.565*					
10	R.PCS	.632*	.509*	.619*	.654*	.604*	.535*	.298*	.571*	**.461***				
11	K.PCS	.603*	.529*	.600*	.643*	.596*	.513*	.406*	.609*	**.462***	**.711***			
12	**RC**	.652*	.553*	.646*	**.687***	.640*	.619*	.472*	**.699***	.801*	.849*	.851*		
13	**IC**	.784*	.742*	.816*	**.868***	.808*	.800*	.621*	**.902***	.680*	.711*	.784*	**.891***	
14	**BP**	.564*	.534*	.641*	**.647***	.598*	.550*	.258*	**.557***	.375*	.729*	.609*	**.670***	**.698***

*Correlation is significant at 0.01 levels (2-tailed)

Intellectual Capital (IC) Variables:

Pearson correlation matrix table (5.25) shows that the relationships among the intellectual capital variables are strong, where r ranges from 0.659 to 0.699. The correlation between human and structural capital is strong, where r equals 0.659; and the correlation between human capital and relational capital is strong, where r equals 0.687. Finally, the correlation between structural capital and relational capital is also strong, where r equals 0.699. The results indicate that there is a high relationship among intellectual capital variables.

The matrix shows that the relationship between the total intellectual capital and each intellectual capital variable is very strong, where r ranges from 0.801 to 0.902. The matrix also shows that the relationship between intellectual capital variables and JPM Organizations' business performance is strong, where r ranges from 0.557 to 0.670. For total intellectual capital r reaches 0.698, and indicates a very strong relationship between intellectual capital and JPM Organizations' business performance.

1. **Human Capital Variable:** Pearson correlation matrix table (5.25) shows that the relationships among the human capital sub-variables are strong, where r ranges from 0.701 to 0.745. The results indicate that the human capital sub-variables are strongly related with each other. The matrix also shows that the relationship between the human capital sub-variables and JPM Organizations' business performance is strong, where r ranges from 0.534 to 0.641. For the human capital variable r equals 0.647 indicates a very strong relationship between the human capital variable and JPM Organizations' business performance.

1.1. Learning and Education (L&E) Sub-variable: The matrix shows that the relationship between the learning and education sub-variable and JPM Organizations' business performance is strong, where r equals 0.564.

1.2. Experience and Expertise (E&E) Sub-variable: The matrix shows that the relationship between the experience and expertise sub-variable and JPM Organizations' business performance is strong, where r equals 0.534.

Innovation and Creation (I&C) Sub-variable: The matrix shows that the relationship between the innovation and creation sub-variable and JPM Organizations' business performance is strong, where r equals 0.641.

2. Structural Capital (SC) Variable: Pearson correlation matrix table (5.25) shows that the relationship among the structural capital sub-variables are strong, where r ranges from 0.339 to 0.631, and indicates that the structural capital sub-variables are strongly related to each other. The matrix also shows that the relationship between the structural capital sub-variables and JPM Organizations' business performance is strong, where r ranges from 0.258 to 0.598. For the structural capital variable r equals 0.557 which indicates a very strong relationship between the structural capital variable and JPM Organizations' business performance.

2.1. Systems and Programs (S&P) Sub-variable: The matrix shows that the relationship between the systems and programs sub-variable and JPM Organizations' business performance is strong, where r equals 0.598.

2.2. Research and Development (R&D) Sub-variable: The matrix shows that the relationship between the research and development sub-variable and JPM Organizations' business performance is strong, where r equals 0.550.

2.3. Intellectual Property Rights (IPRs) Sub-variable: The matrix shows that the relationship between the intellectual property rights sub-variable and JPM Organizations' business performance is strong, where r equals 0.258.

3. Relational Capital (RC) Variable: Pearson correlation matrix table (5.29) shows that the relationships among the relational capital sub-variables are strong, where r ranges from 0.461 to 0.711. This indicates that the structural capital sub-variables are strongly related with each other. The matrix also shows that the relationship between the relational capital sub-variables and JPM Organizations' business performance is strong, where r ranges from 0.375 to 0.729. The relational capital variable r equals 0.670, and indicates a strong relationship between the relational capital variable and JPM Organizations' business performance.

3.1. Alliances, Licensing and Agreements (ALA) Sub-variable: The matrix shows that the relationship between the alliances, licensing and agreements sub-variable and JPM Organizations' business performance is strong, where r equals 0.375.

3.2. Relations with Partners, Suppliers and Customers (R.PSC) Sub-variable: The matrix shows that the relationship between the relations with partners, suppliers and customers' sub-variable and JPM Organizations' business performance is strong, where r equals 0.729.

3.3. Knowledge about Partners, Suppliers and Customers (K.PSC) Sub-variable: The matrix shows that the relationship between the knowledge about partners, suppliers and customers' sub-variable and JPM Organizations' business performance is strong, where r equals 0.609.

5.4. Section Four: Hypotheses Testing

To test hypotheses, a multiple regression analysis was used to analyze the relationship between the intellectual capital variables (sub-variables) and JPM Organizations' business performance. Regression analysis is robust against non-normality and, therefore, applicable in the case at hand.

The coefficient of determination (R^2) indicates the goodness and fitness of the model. The higher the R^2, the better the independent variable(s) explain(s) that the variation in the dependent variable. The t-value indicates the significance of the relationships found. The main assumptions of regression are (Norusis, 1993, Berenson et.al, 2006 and SPSS 16.0, 2007):

1- **Linearity test**: States that the relation between variables is a linear relationship. To test the Linearity will depend on plotting of Studentized residual against the predicted value. When there is no relation between the predicted and residual values, in such case the model does not violate this assumption.

2- **Independence of errors**: States that the errors are independent from one another. Durbin-Watson test is used to test independence of errors, if D equals two, in such case the model does not violate this assumption.

3- **Normality**: Requires that the errors should be normally distributed at each value of X. To test the normality will depend on the histogram of residuals. If the shape follows the normal distribution, in such case the model does not violate this assumption.

Equal variance (homoscedasiticity): Requires that the errors are constant for all the value of independent variables. The equal variance is important for making inferences about β_o and B_1. To test the Equal variance will depend on the plot of Studentized residual against the predicted value. When there is no relation between the predicted and residual values, in such case the model does not violate this assumption.

4- **Multi-Collinearity**: Refers to a situation in which one or more variables are highly correlated. To test the collinearity, the VIF (Variance Inflation Factor) will be used. When VIF is less than 10, in such case the Collinearity model does not violate this assumption.

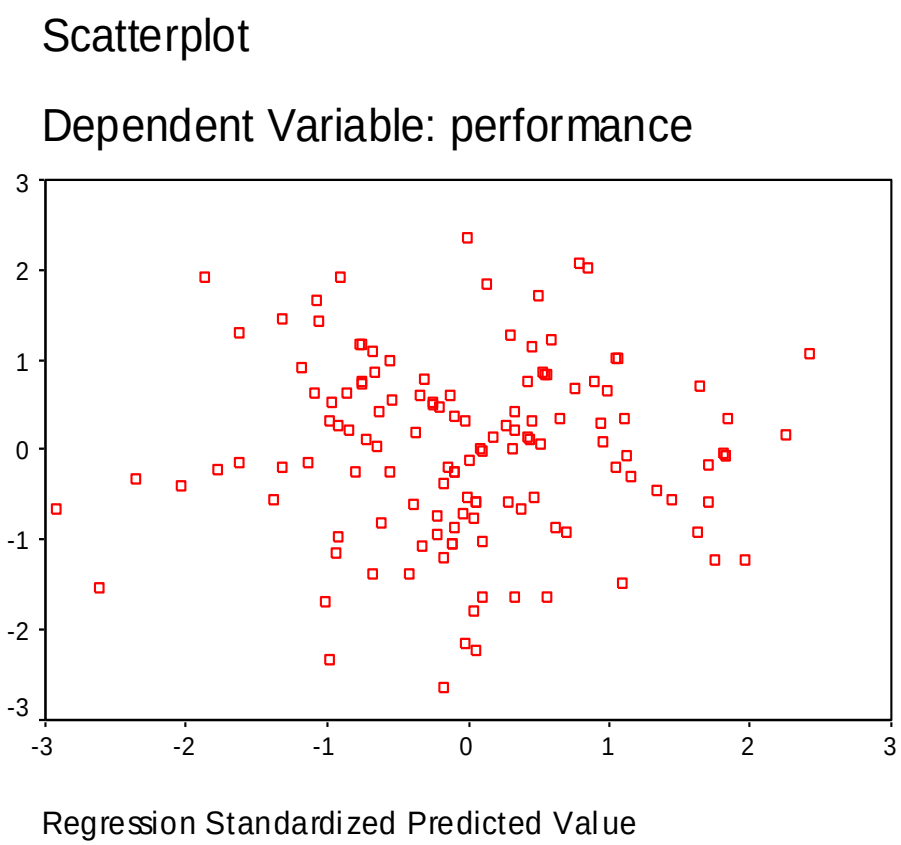
First Hypothesis:

Ho: Human capital sub-variables do not affect the JPM Organizations' business performance.

Before conducting the multiple regression models, the researcher will test the underlying assumption of the test:

1- **Linearity**: From figure (5.1), the plot of Studentized residual against the predicted value; it is clear that the linearity assumption is not violated because there is no relation between the predicted and residual values. Because the scatter-plots of individual variables do not indicate any nonlinear relationships between the dependent variable and the independent variables, therefore, the linearity is guaranteed.

Figure (5.1): Studentized Residual Against the Predicted Value for First Hypothesis



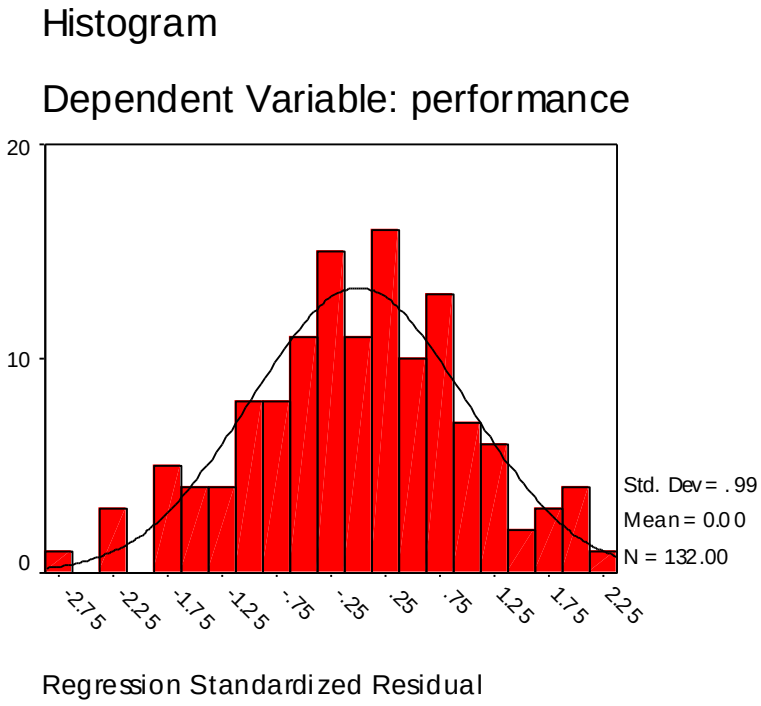
2- **Multi-collinearity**: From table (5.26), the VIF value is less than 10 and the Tolerance value is more than 0.2. This indicates that there is no Collinearity within the independent variables of the study.

Table (5.26): Multi-collinearity Test for First Hypothesis:

Human Capital Sub-variables	**Multi-Collinearity Statistics**	
	Tolerance	**VIF**
Learning and education	0.428	2.336
Experience and expertise	0.374	2.673
Innovation and creation	0.386	2.594

3- **Normality of test**: The *Zresid histogram* figure (5.2) below, shows that the assumption of normality distribution is met.

Figure (5.2): Histogram of Standardized Residuals First Hypothesis.



4- **Equal variance (homoscedasiticity):** From figure (5.2), it can be observed that the residual is spread. This means that the residuals do not increase or decrease with the values of the independent sub-variables or the predicting variable, therefore the equal variance is not violated.

5- **Independence of errors**: To test this assumption, Durbin Watson test is conducted, where (d=1.965), which approximately equals two. This indicates that the residuals are not correlated with each other; therefore, the independence of errors is not violated.

After achieving the underlying assumption of regression model, the researcher conducted the analysis as follows:

Multiple Regressions:

Table (5.27): Results of Multiple Regression Analysis: Regressing Human Capital Sub-variables against Business Performance

Variable	**r**	**R^2**	**ANOVA F- Value**	**Sig.**
Human Capital Sub-variables	0.661	0.437	33.142	0.000

The R square value is 0.437; therefore, the model is regarded as being suitable to be used for multiple regressions with the data.

The results of the multiple regression analysis that regress the three sub-variables of human capital are shown on table (5.27). It shows that the three sub-variables together explained 43.7 percent of the variance, where (R^2 =0.437, F=33.142, Sig. =0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that the human capital sub-variables affect JPM Organizations' business performance. The following table shows the significant effect of each sub-variable within the human capital variable.

Table (5.28): Un-standardized and Standardized Coefficients of Multiple Regression Model for Human Capital Sub-variables:

Human Capital Sub-variables	**Un-standardized Coefficients**		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t-value**	**p**
(Constant)	0.919	0.301		3.051	0.003
Learning and education	0.243	0.115	0.213	2.106	0.037 *
Experience and ertise	0.044	0.132	0.036	0.329	0.743
Innovation and creation	0.464	0.107	0.465	4.350	0.000 *

**CALCULATE IS LESS THAN 0.05*

The conclusion of table (5.28) shows that the innovation and creation sub-variable has the highest effect on JPM Organizations' business performance, where (Beta=0.465, sig.=0.000). Thus, it indicates that the innovation and creation sub-variable is the most significant, and it positively and directly regresses to the JPM Organizations' business performance, followed by the learning and education sub-variable, where (Beta=0.213, sig.=0.037), then the experience and expertise sub-variable, where (Beta=0.036, sig.=0.743). The relationship between the dependent and independent variables derived by this model can thus be expressed as:

Human capital = 0.919 + 0.464 (Innovation and creation) + 0.243 (Learning and education) + 0.0435 (Experience and expertise)

The following sub-hypotheses encompass the study variables and answer the questions that were raised earlier in the study problem:

Sub Hypothesis 1-1

Ho: Learning and education sub-variable does not affect the JPM Organizations' business performance.

From table (5.28), it is concluded that there is a positive direct effect of the learning and education sub-variable on the JPM Organizations' business performance, where (Beta=0.213, sig.=0.037). Since (t=2.106, $p < 0.05$), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the learning and education sub-variable affects the JPM Organizations' business performance at $\alpha = 0.05$.

Sub Hypothesis 1-2

Ho: Experience and expertise sub-variable does not affect the JPM Organizations' business performance.

From table (5.28), it is concluded that there is very weak positive direct effect of the experience and expertise sub-variable on the JPM Organizations'

business performance, where (Beta=0.036, sig.=0.743). Since (t=0.329, *P* > 0.05), the null hypothesis is accepted, which indicates that the experience and expertise sub-variable does not affect the JPM Organizations' business performance at α =0.05.

Sub Hypothesis 1-3

Ho: Innovation and creation sub-variable does not affect the JPM Organizations' business performance.

From table (5.28), it is concluded that there is a positive direct effect of the innovation and creation sub-variable on the JPM Organizations' business performance, where (Beta=0.465, sig.=0.000). Since (t=4.350, *P* < 0.05), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the innovation and creation sub-variable affects the JPM Organizations' business performance at α =0.05.

Stepwise regression:

To determine which sub-variables are important in this model, the researcher used stepwise regression. The results are shown on table (5.29):

Table (5.29): Stepwise Regressions (ANOVA) for Human Capital Sub-variables

Model	r	R^2	F	Sig.	Human Capital Sub-variables
1	0.641(a)	0.411	90.552	0.000	Innovation and Creation
2	0.661(b)	0.437	50.005	0.000	Innovation and Creation plus Learning and Education

From table (5.29) above, the first model of stepwise regression (ANOVA) shows the importance of the innovation and creation sub-variable, where (*R^2 =0.411, F=90.552, Sig. =0.000*). The second model of stepwise regression shows the importance of the innovation and creation sub-variable plus learning and education sub-variable, where (*R^2 =0.437, F=50.005, Sig. =0.000*). Therefore, it is concluded that the second model increases R^2 with 0.026, this means that the innovation and creation sub-variable alone explains 41.1% of the variance in the JPM Organizations' business performance. While the second model explains 43.7% of the variance, this means that learning and education sub-variable adds only 2.6% to the first model. The following table (5.30) shows the relation between the human capital sub-variables and JPM Organizations' business performance:

Table (5.30): Stepwise Regressions Model for Human Capital Sub-variables

	Model 1		**Model 2**	
Human Capital Sub-variables	**Un-standardized Coefficients**	**beta**	**Un-standardized Coefficients**	**beta**
Constant	1.362		0.959	
Learning and education	-		0.258	0.227
Experience and expertise	-			
Innovation and creation	0.640	0.641	0.481	0.482

**sig. <0.05*

From table (5.30) above, the first model of stepwise regression shows that there is a positive direct relation between the innovation and creation sub-variable and JPM Organizations' business performance, where beta equals 0.641. The second model of stepwise regression shows that there is a positive direct relation between the innovation and creation sub-variable plus learning and education sub-variable with JPM Organizations' business performance, where beta equals 0.482 and 0.227, respectively. Such results indicate that the innovation and creation sub-variable is the most important sub-variable, followed by the learning and education sub-variable, while the experience and expertise sub-variable does not significantly impact the JPM Organizations' business performance.

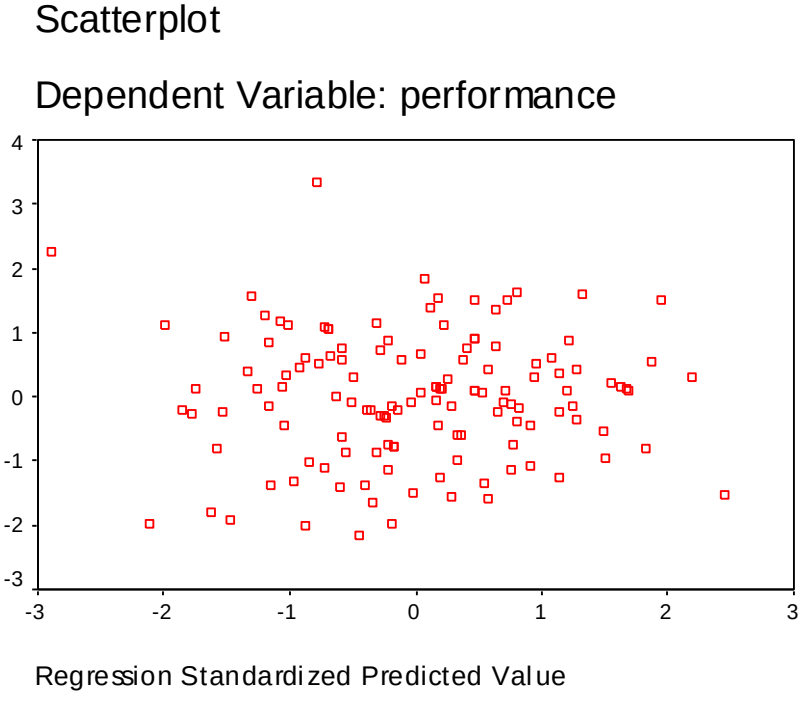
Second Hypothesis:

Ho: Structural capital sub-variables do not affect the JPM Organizations' business performance.

Before conducting the multiple regression models, the researcher will test the underlying assumption of the test:

1- Linearity: From figure (5.3), the plot of Studentized residual against the predicted value, it is clear that the linearity assumption is not violated because there is no relation between the predicted and the residual values. Because the scatter-plots of individual variables do not indicate any nonlinear relationships between the dependent variable and the independent variables, therefore, the linearity is guaranteed.

Figure (5.3): Studentized Residual Against the Predicted Value for Second Hypothesis:



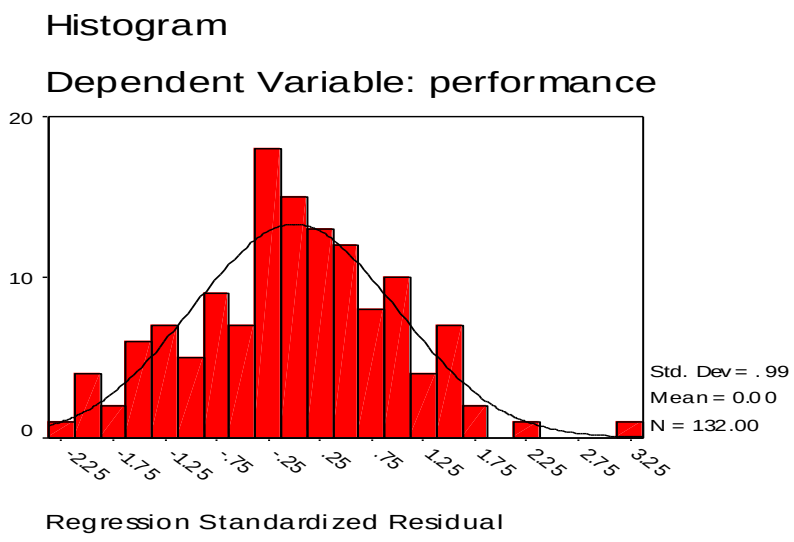
Multi-collinearity: From table (5.31), the VIF value is less than 10 and the Tolerance value is more than 0.2. This indicates that there is no multi-collinearity within the independent variables of the study.

Table (5.31): Multi-collinearity Test for Second Hypothesis

Structural Capital Sub-variables	**Multi-Collinearity Statistics**	
	Tolerance	**VIF**
Systems and Programs &P)	0.602	1.661
Research and velopment (R&D)	0.499	2.005
Intellectual Property Rights Rs)	0.733	1.365

2- Normality of test: The *Zresid histogram* figure (5.4) below, shows that the assumption of normality distribution is met.

Figure (5.4): Histogram of Standardized Residuals for Second Hypothesis:



3- **Equal variance (homoscedasiticity)**: From figure (5.4), it can be observed that the residual is spread; this means that the residuals do not increase or decrease with values of the independent sub-variables or the predicting variable, therefore, the equal variance is not violated.

5- **Independence of errors**: To test this assumption, Durbin Watson test is conducted, where (d=2.012), which approximately equals two. This indicates that the residuals are not correlated with each other; therefore, the independence of errors is not violated.

After achieving the underlying assumptions of regression model, the researcher conducted the analysis follows:

Table (5.32): Results of Multiple Regressions Analysis: Regressing Structural Capital Sub-variables against Business Performance.

Variable	**r**	**R^2**	**ANOVA F-Value**	**Sig.**
Structural Capital Sub-variables	0.640	0.409	29.53	.000

The results of the multiple regression analysis that regress the three sub-variables of the structural capital are shown on table (5.32). It shows that the three sub-variables together explained 40.9 percent of the variance, where (R^2=0.409, F=29.53, Sig.=0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, this indicates that the structural capital sub-variables affect the JPM Organizations' business performance. The following table (5.33) shows the significant effect of each sub-variable within the structural capital variable.

The conclusion of table (5.33) shows that the systems and programs sub-variable has the highest effect on JPM Organizations' business performance, where (Beta=0.418, sig.=0.000).

Table (5.33): Un-standardized and Standardized Coefficients of Multiple Regression Model for Structural Capital Sub-variables.

Structural Capital Sub-variables	**Un-standardized Coefficients**		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t-value**	**p**
(Constant)	1.521	0.220		6.924	0.000
Systems and Programs (S&P)	0.390	0.082	0.418	4.774	0.000*
Research and Development (R&D)	0.245	0.076	0.309	3.214	0.002*
Intellectual Property Rights (IPRs)	-0.031	0.056	-0.044	-0.555	0.580

**CALCULATE IS LESS THAN 0.05*

Thus, it indicates that the systems and programs sub-variable is the most significant and it positively and directly regresses to the JPM Organizations' business performance, followed by the research and development sub-variable, where (Beta=0.309, sig.=0.002). While the intellectual property rights (IPRs) sub-variable has a negative effect on JPM Organizations' business performance, where (Beta =-0.044, sig.=0.580). The relationship between the dependent and independent variables derived by this model can thus be expressed as:

Structural Capital = 1.521 + 0.390 (systems and programs) + 0.245 (research and development) + -0.031 (intellectual property rights)

The following sub-hypotheses encompass the study variables and answer the questions that were raised earlier in the study problem:

Sub Hypothesis 2-1

Ho: Systems and Programs sub-variable does not affect the JPM Organizations' business performance.

From table (5.33) above, it is concluded that there is a positive direct effect of the systems and programs sub-variable on the JPM Organizations' business performance, where (Beta=0.418, sig.=0.000). Since (t=4.774, P < 0.05), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the systems and programs sub-variable positively and directly affects the JPM Organizations' business performance at α =0.05.

Sub Hypothesis 2-2

Ho: Research and development (R&D) sub-variable does not affect the JPM Organizations' business performance.

From table (5.33) above, it is concluded that there is a positive direct effect of the research and development sub-variable on JPM Organizations' business performance where (Beta=0.309, sig.=0.002). Since (t=3.214, *P* < 0.05), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the research and development sub-variable positively and directly affects the JPM Organizations' business performance at α =0.05.

Sub Hypothesis 2-3

Ho: Intellectual property rights (IPRs) sub-variable does not affect the JPM Organizations' business performance.

From table (5.33) above, it is concluded that there is a negative direct effect of the intellectual property rights sub-variable on the JPM Organizations' business performance, where (Beta =-0.044, sig.=0.580). Since (t=-0.555, *P* > 0.05), the null hypothesis is accepted, which indicates that the intellectual property rights sub-variable does not affect JPM Organizations' business performance at α =0.05.

Stepwise regression:

To determine which sub-variables are important in this model, the researcher used stepwise regression shown in the following table:

Table (5.34): Stepwise Regressions (ANOVA) for Structural Capital Sub-variables

Model	r	R^2	F	Sig.	Structural Capital Sub-variables
1	0.598(a)	0.358	72.467	.000	Systems and Programs
2	0.638(b)	0.408	44.372	.000	Systems and Programs plus Research and Development

From table (5.34) above, the first model stepwise regression shows the importance of the systems and programs sub-variable, where

(R^2=0.358, F=72.467, Sig.=0.000). The second model stepwise regression shows the importance of the systems and programs sub-variable plus the research and development sub-variable, where (R^2=0.408, F=44.372, Sig.=0.000). Therefore, it is concluded that the second model increases R^2 with 0.050. This means that the systems and programs sub-variable explains 35.8% of the variance in the JPM Organizations' business performance, while the second model explains 40.8% of the variance. This means that it adds only 5% to the first model. The following table shows the relation between the structural capital sub-variables and JPM Organizations' business performance:

Table (5.35): Stepwise Regressions Model for Structural Capital Sub-variables

	Model 1		**Model 2**	
Structural Capital Sub-variables	**Un-standardized Coefficients**	**beta**	**Un-standardized Coefficients**	**beta**
Constant	1.687		1.493	
Systems and programs	0.558	0.598	0.389	0.417
Research and development	-		0.228	0.287
Intellectual property rights	-	-	-	-

**sig. <0.05*

From table (5.35), the first model of stepwise regression shows that there is a positive direct relation between the systems and programs sub-variable and JPM Organizations' business performance, where beta equals 0.598. The second model of stepwise regression shows that there is a positive direct relation between the systems and programs sub-variable plus the research and development sub-variable with the JPM Organizations' business performance, where beta equals 0.417 and 0.287, respectively.

Such results indicate that the systems and programs sub-variable is the most important sub-variable, followed by the research and development sub-variable, while the intellectual property rights sub-variable does not significantly impact the JPM Organizations' business performance.

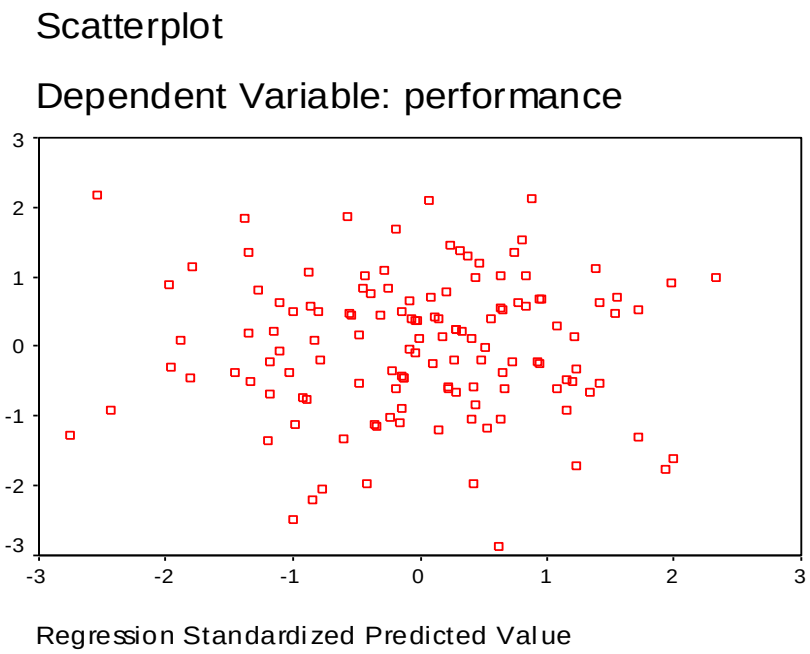
Third Hypothesis:

Ho: Relational capital sub-variables do not affect the JPM Organizations' business performance.

Before conducting the multiple regression models, the researcher will test the underlying assumption of the test:

1- **Linearity**: From figure (5.5), the plot of Studentized residual against the predicted value, it is clear that the linearity assumption is not violated because there is no relation between the predicted and the residual values. Because the scatter-plots of individual variables do not indicate any nonlinear relationships between the dependent variable and the independent variables, therefore, the linearity is guaranteed.

Figure (5.5): Studentized Residual Against the Predicted Value for Third Hypothesis:



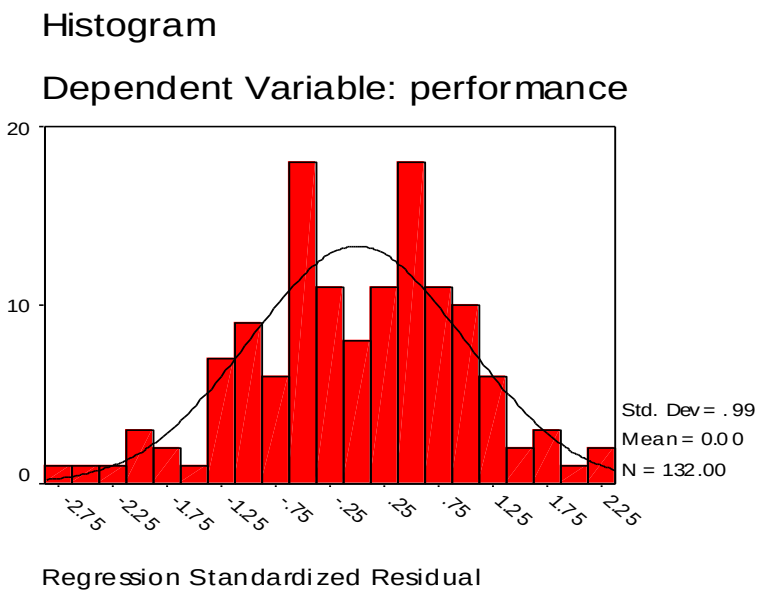
2- **Multi-collinearity**: From table (5.36), the VIF value is less than 10 and the Tolerance value is more than 0.2. This indicates that there is no multi-collinearity within the independent variables of the study.

3- **Table (5.36):** Multi-collinearity Test for the Third Hypothesis:

Relational Capital Sub-variables	**Multi-Collinearity Statistics**	
	Tolerance	**VIF**
Alliances, licensing & agreements (ALA)	0.751	1.331
Relations with partners, suppliers & customers (R.PSC)	0.471	2.121
Knowledge about partners, suppliers & customers (K.PSC)	0.471	2.122

4- **Normality of test**: The *Zresid histogram* figure (5.6) below, shows that the assumption of normality distribution is met.

Figure (5.6): Histogram of Standardized Residuals for Third Hypothesis:



5- **Equal variance (homoscedasiticity)**: From figure (5.6) above, it can be observed that the residual is spread; this means that the residuals do not increase or decrease with values of the independent sub-variables or the predicting variable, therefore, the equal variance is not violated.

6- **Independence of errors**: To test this assumption, Durbin Watson test is conducted, where (d=1.821), which approximately equals two; this indicates that the residuals are not correlated with each other; therefore, the independence of errors is not violated.

After achieving the underlying assumption of regression model, the researcher conducted the analysis as follows:

Table (5.37): Results of Multiple Regressions Analysis: Regressing Relational Capital Sub-variables against Business Performance

Variable	**r**	**R^2**	**ANOVA F-Value**	**Sig.**
Relational Capital Sub-variables	0.740	0.548	51.788	0.000

The results of the multiple regression analysis that regress the three sub-variables of the relational capital are shown on table (5.37) above. The three sub-variables together explained 54.8 percent of the variance, where (R^2 =0.548, F=51.788, Sig.=0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. It indicates that the relational capital sub-variables affect the JPM Organizations' business performance. The following table shows the significant effect of each sub-variable within the relational capital variable.

Table (5.38): Un-standardized and Standardized Coefficients of Multiple Regression Model for Relational Capital Sub-variables

Relational Capital Sub-variables	**Un-standardized Coefficients**		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t-value**	**p**
(Constant)	0.548	0.245		2.236	0.027
Alliances, licensing & agreements	0.016	0.058	0.019	0.272	0.786
Relations with partners, suppliers & customers	0.622	0.091	0.594	6.862	0.000*
Knowledge about partners, suppliers & customers	0.184	0.089	0.178	2.058	0.042*

**CALCULATE IS LESS THAN 0.05*

The conclusion of table (5.38), shows that the relations with partners, suppliers and customers sub-variable has the highest effect on JPM Organizations' business performance, where (Beta=0.594, sig.=0.000). Thus, it indicates that the relations with partners, suppliers and customers sub-variable is the most significant and it is positively and directly regress to the JPM Organizations' business performance, followed by the knowledge about partners, suppliers and customers sub-variable, where (Beta=0.178, sig.=0.042), while the alliance, licensing and agreements sub-variable has the lowest effect, where (Beta=0.019, sig.=0.786). The relationship between the dependent and independent variables derived by this model can thus be expressed as:

Relational capital = 0.548 + 0.622 (Relations with partners, suppliers and customers) + 0.184 (Knowledge about partners, suppliers and customers) + 0.016 (Alliances, licensing and agreements).

The following sub-hypotheses encompass the study variables and answer the questions that were raised earlier in the study problem:

Sub Hypothesis 3-1

Ho: Alliances, licensing and agreements sub-variable does not affect the JPM Organizations' business performance.

From table (5.38), it is concluded that there is no positive direct effect of the alliances, licensing and agreements sub-variable on the JPM Organizations' business performance, where (Beta=0.019, sig.=0.786). Since (t=0.272, $P > 0.05$), therefore, the null hypothesis is accepted, which indicates that the alliances, licensing and agreements sub-variable does not affect the JPM Organizations' business performance at $\alpha = 0.05$.

Sub Hypothesis 3-2

Ho: Relations with partners, suppliers and customers' sub-variable does not affect the JPM Organizations' business performance.

From table (5.38), it is concluded that there is a positive direct effect of the relations with partners, suppliers and customers' sub-variable on the JPM Organizations' business performance, where (Beta=0.594, sig.=0.000). Since (t=6.862, $P < 0.05$), the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the relations with partners, suppliers and customers sub-variable affects JPM Organizations' business performance at $\alpha = 0.05$.

Sub Hypothesis 3-3

Ho: Knowledge about partners, suppliers and customers' sub-variable does not affect the JPM Organizations' business performance.

From the table (5.38), it is concluded that there is a positive direct effect of the knowledge about partners, suppliers and customers' sub-variable on the JPM Organizations' business performance, where (Beta=0.178, sig.=0.042). Since (t=2.058, $P < 0.05$), therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the knowledge about partners, suppliers and customers sub-variable affects JPM Organizations' business performance at α =0.05.

Stepwise regression:

To determine which sub-variables are important in this model, the researcher used stepwise regression model shown in following table:

Table (5.39): Stepwise Regressions (ANOVA) for Relational Capital Sub-variables

Model	**r**	**R^2**	**F**	**Sig.**	**Relational Capital Sub-variables**
1	0.729(a)	0.531	147.457	0.000	Relations with partners, suppliers and customers
2	0.740(b)	0.548	78.205	0.000	Relations with partners, suppliers and customers plus Knowledge about partners, suppliers and customers

From table (5.39) above, the first model of stepwise regression shows the importance of the relations with partners, suppliers and customers sub-variable, where (R^2=0.531, F=147.457, Sig.=0.000). The second model of stepwise regression shows the importance of the relations with partners, suppliers and customers sub-variable plus the knowledge about partners, suppliers and customers sub-variable, where (R^2 =0.548, F=78.205, Sig. =0.000). Therefore, it is concluded that the second model increases R^2 with 0.017. This means that the relations with partners, suppliers and customers' sub-variable alone explain 53.1% of the variance, while the second model explains 54.1% of the variance. This means that it adds only 1.7% to the first model. The following table shows the relation between the relational capital sub-variables and JPM Organizations' business performance:

Table (5.40): Stepwise Regressions Model for Relational Capital Sub-variables

Relational Capital Sub-variables	**Model 1**		**Model 2**	
	Un-standardized Coefficients	**beta**	**Un-standardized Coefficients**	**beta**
Constant	0.712		0.566	
Alliances, licensing & agreements				
Relations with partners, suppliers & customers	0.764	0.729	0.627	0.599

**sig. <0.05*

Knowledge about partners, suppliers & customers			0.189	0.183

From table (5.40) above, the first model of stepwise regression shows that there is a positive direct relation between the relations with partners, suppliers and customers' sub-variable and the JPM Organizations' business performance, where beta equals 0.729. The second model of stepwise regression shows that there is a positive direct relation between the relations with partners, suppliers and customers' sub-variable plus the knowledge about partners, suppliers and customers' sub-variable with JPM Organizations' business performance where beta equals 0.599 and 0.183, respectively. Such results indicate that the relations with partners, suppliers and customers' sub-variable is the most important sub-variable, followed by the knowledge about partners, suppliers and customers' sub-variable, while the alliances, licensing and agreements sub-variable does not significantly impact the JPM Organizations' business performance.

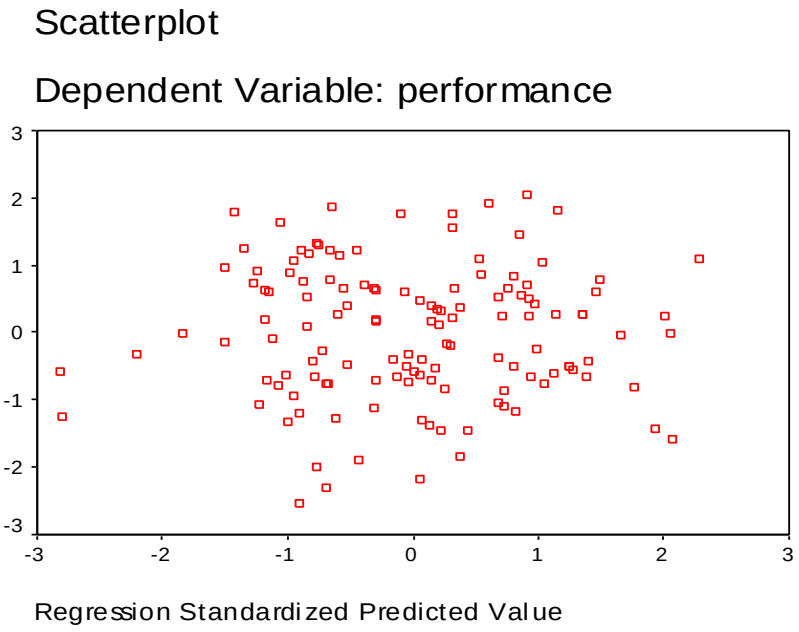
The Main Hypothesis:

Ho: Intellectual Capital variables do not affect the JPM Organizations' business performance.

Before conducting the multiple regression models, the researcher will test the underlying assumption of the test:

1- **Linearity**: From figure (5.7), the plot of Studentized residual against the predicted value, it is clear that the linearity assumption is not violated, because there is no relation between the predicted and the residual values. Because the scatter-plots of individual variables do not indicate any nonlinear relationships between the dependent variable and the independent variables, therefore, the linearity is guaranteed.

Figure (5.7): Studentized Residual Against the Predicted Value for Main Hypothesis:



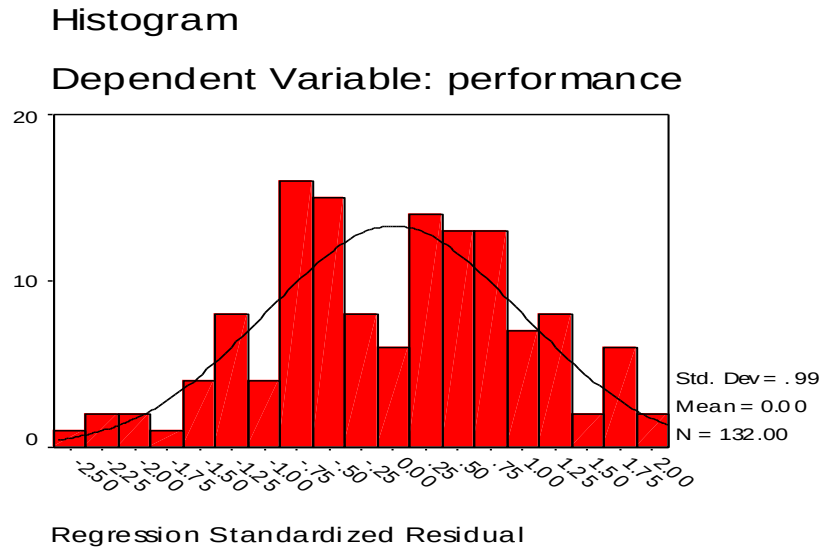
2- **Multi-collinearity**: From table (5.41), the VIF value is less than 10 and the Tolerance value is more than 0.2. This indicates that there is no multi-collinearity within the independent variables of the study.

Table (5.41): Multi-collinearity Test for the Main Hypothesis:

Intellectual capital Sub-variables	**Multi-Collinearity Statistics**	
	Tolerance	**VIF**
Human Capital	0.465	2.149
Structural Capital	0.421	2.217
Relational Capital	0.465	2.376

3- **Normality of test**: The *Zresid histogram* figure (5.8) below shows that the assumption of normality distribution is met.

Figure (5.8): Histogram of Standardized Residuals for Main Hypothesis.



4- **Equal variance (homoscedasiticity)**: From figure (5.8) above, it can be observed that the residual is spread; this means that the residuals do not increase or decrease with values of the independent variables or the predicting variable, therefore, the equal variance is not violated.

5- **Independence of errors**: To test this assumption, Durbin Watson test is conducted where (d=1.821), which approximately equals two. This indicates that the residuals are not correlated with each other; therefore, the independence of errors is not violated.

After achieving the underlying assumption of the regression model, the researcher conducted the following analysis:

Table (5.42): Results of Multiple Regressions Analysis: Regressing Intellectual Capital Variables against Business Performance

Variable	**r**	**R^2**	**F- Value**	**Sig.**
Intellectual capital variables	0.719	0.517	45.597	0.000

The results of the multiple regression analysis that regress the three variables of the intellectual capital are shown on table (5.42) above. The three variables together explained 51.7 percent of the variance, where (R^2 =0.517, F=45.597, Sig.=0.000), therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the intellectual capital variables affect the JPM Organizations' business performance. The following table shows the significant effect of each variable within the intellectual capital.

The conclusion of table (5.43) shows that the relational capital variable has the highest effect on JPM Organizations' business performance, where (Beta=0.402, sig.=0.042).

Table (5.43): Un-standardized and Standardized Coefficients of Multiple Regression Model for Intellectual Capital Variables

Intellectual Capital Variables	**Un-standardized Coefficients**		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t-value**	**p**
(Constant)	0.259	0.281		0.922	0.358
Human Capital	0.411	0.111	0.334	3.708	0.000*
Structural Capital	0.054	0.090	0.055	0.604	0.547
Relational Capital	0.469	0.110	0.402	4.247	0.000*

**CALCULATE IS LESS THAN 0.05*

Thus, it indicates that the relational capital variable is the most significant and it positively and directly regresses to the JPM Organizations' business performance, followed by human capital variable, where (Beta=0.334, sig.=0.000), while structural capital variable has the lowest effect on JPM Organizations' business performance, where (Beta=0.055, sig.=0.547). The relationship between the dependent and independent variables derived by this model can thus be expressed as:

Intellectual capital = 0.259 + 0.411 (Human capital) + 0.054 (Structural capital) + 0.469 (Relational capital).

Sequential Regression:

Table (5.44) shows the results of the sequential regression analysis that regress the three variables of *intellectual capital* sequentially. The first model of sequential regression shows the effect of the human capital variable on the JPM Organizations' business performance, where R^2 equals 0.437 (F=33.142, sig.=0.000). This means that the human capital variable explains 43.7% of variance.

Table (5.44): Results of the Sequential Regression Analysis: Regressing Intellectual Capital Variables against Business Performance:

Variable	**R^2**	**R^2 Change**	**F change**	**Sig. F change**	**F**	**Sig. F**
Model 1	0.437	0.437	33.142	0.000	33.142	0.000
Model 2	0.480	0.043	3.471	0.018	19.266	0.000
Model 3	0.610	0.130	13.529	0.000	21.216	0.000

The second model of sequential regression shows that after adding the second variable (structural capital) to the first model, the importance of the second variable equals R^2 change i.e. 0.043 (F change = 3.471, sig. F change = 0.018). The total second model explains 48% of the variance, where (F=19.266, sig. F=0.000). The third model of sequential regression shows that after adding the third variable

(relational capital) to the second model, the importance of the third variable equals R^2 change i.e. 0.130 (F change = 13.529, sig. F change = 0.000). The whole third model explains 61% of variance, where (F=21.216, sig. F=0.000).

Table (5.45): Standardized Coefficients (Beta) of Sequential Regression Models for all Intellectual Capital Sub-variables

Variable	**Model 1**	**Model 2**	**Model 3**
Learning and education	0.213*	0.127	-0.051
Experience and Expertise	0.036	0.040	0.073
Innovation and Creation	0.465*	0.297*	0.182
Systems and Programs		0.147	0.051
Research and Development		0.216*	0.158
Intellectual Property Rights		-0.039	-0.063
Alliances, Licensing and Agreements			-0.034
Relations with Partners, Suppliers and Customers			0.467*
Knowledge about Partners, Suppliers and Customers			0.090

*Sig. <0.05

Table (5.45) shows the importance of intellectual capital sub-variables within each model. The first model of sequential regression shows the importance of the innovation and creation sub-variable for JPM Organizations'

business performance, where Beta =0.465, then the leaning and education sub-variable, where Beta =0.213, while the experience and expertise sub-variable is not significant (important) for JPM Organizations' business performance, where beta =0.036.

The second model of sequential regression (after adding the structural capital sub-variables to first model) shows the importance of the innovation and creation sub-variable for JPM Organizations' business performance, where Beta =0.297, then the research and development sub-variable, where Beta =0.216, while the other sub-variables show little importance (not significant) for the JPM Organizations' business performance, except the intellectual property rights sub-variable which shows a negative impact on the JPM Organizations' business performance, where Beta =-0.039. The third model of sequential regression (after adding the relational capital sub-variables to second model) shows that the most important and highly significant sub-variable is the relations with partners, suppliers and customers sub-variable for JPM Organizations' business performance, where Beta =0.467, while the other sub-variables either show little importance compared with this sub-variable or even a negative impact on the JPM Organizations' business performance such as alliances, licensing and agreements, where B=-0.034, learning and education, where B=-0.051, and intellectual property rights, where B=-0.063.

5.5. Section Five: Partial Least Squares (PLS) Model and Path Analysis:

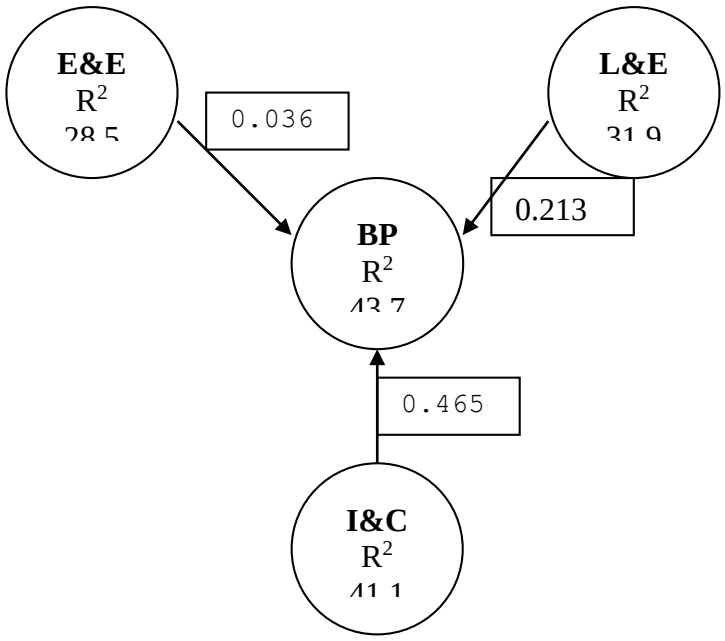
PLS is becoming a common structural equation modeling technique used in management research (Serenko et. al. 2006, P.7). Therefore, the use of PLS as a structural equation modeling technique has received increased interest in the strategic management literature in areas such as intellectual capital management (Bart and Bontis 2003, P.370). Also PLS has been used as a research tool in a variety of settings such as; business disciplines and in intellectual capital research (Bontis 2004, P.30).

PLS has been used in recent researches to test reliability and internal consistency (Pavlou 2004, P.10); to test the conceptual model (O'Donnell et. al. 2005, P.7); to develop a systematic and holistic view when establishing measures to solve research problems (Bontis 1999, P.74); to maximize the explanatory power of conceptual model by examining the R-squared values (Bontis 2002, P.50); to maximize the variance and to explain endogenous model's constructs (Bontis et. al. 2002, P.451); to simultaneously examine constructs and measures within their nomological network (Bontis and Fitz-enz 2002, P.241); to measure construct to construct or construct to measure (Bontis 1998, P.69); to avoid the multi-collinearity and measurement errors, while addressing the cause-effect relationship between intellectual capital and business performance (Wang and Chang 2005, P.228). Finally, PLS is used to draw path analysis models and to calculate the effects of each endogenous construct (Bontis 1998, P.70).

Therefore, PLS is considered as multilevel model and as generalizations of path analysis (Bapuji 2003 P.18), the path loadings represent the causal links from one construct to the other (Bontis 1998, P.69).

Through current study PLS is used to test the conceptual model, to maximize the explanatory power of each sub-variable by examining the R^2 values, to avoid multi-collinearity, to test relationships and interactions among independent variables and sub-variables, and their relationship with dependent variable. Finally, to conduct path analysis by using R^2 and Beta.

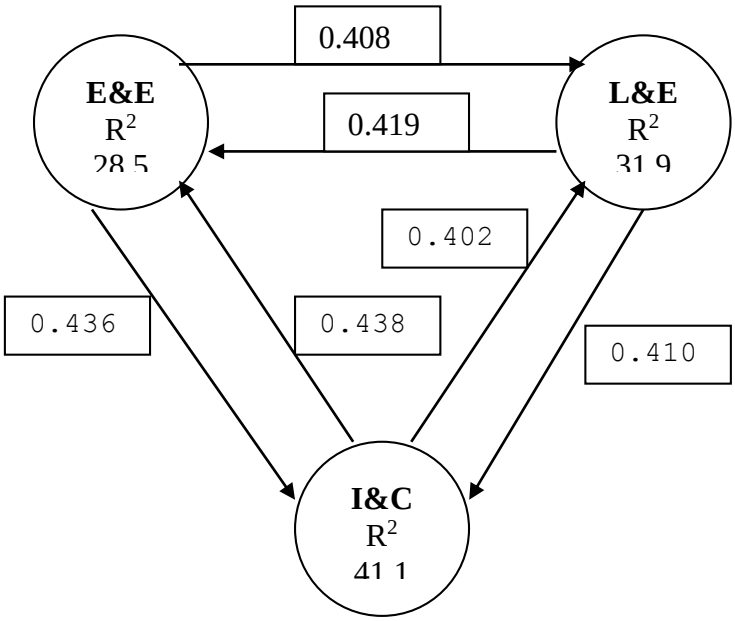
Model (5.1): Human Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.1) shows that the innovation and creation sub-variable has the highest effect among the human capital sub-variables on JPM Organizations'

business performance, where (R^2=41.1 and B=0.465), followed by the learning and education sub-variable, where (R^2=31.9 and B=0.213). While the experience and expertise sub-variable has the lowest effect among all human capital sub-variables, where (R^2=28.5 and B=0.036). The human capital sub-variables together explain 43.7% of variance, where (R^2 =43.7%).

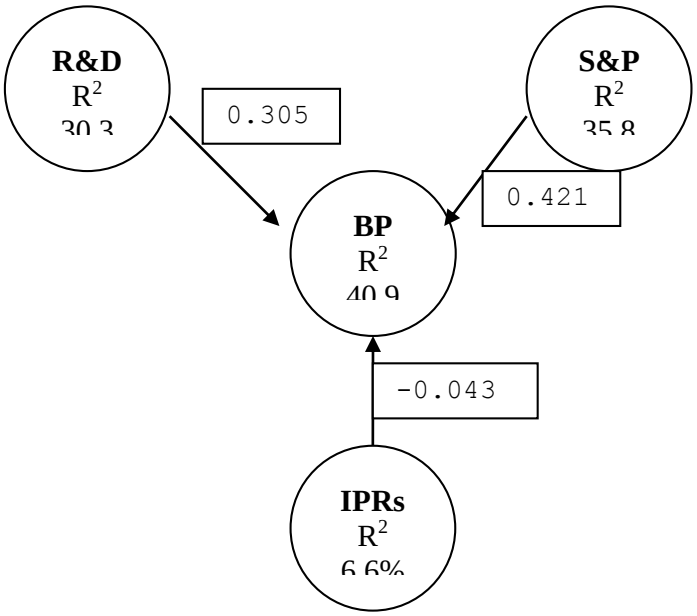
Model (5.2): Human Capital Sub-variables Interaction.



Model (5.2) shows that the correlations and interactions among the human capital sub-variables are strong. The relationship between the learning and education sub-variable and the experience and expertise sub-variable is strong in both directions, where (B=0.419 and B=0.408 respectively), and the relationship between the learning and education sub-variable and the innovation and creation sub-variable is strong in both directions, where (B=41.1 and B=0.408 respectively). Finally,

the relation between the experience and expertise sub-variable and the innovation and creation sub-variable is also strong, where (B=0.438 and B=0.436 respectively). It seems that all the human capital sub-variables are strongly related and interacted with each other at almost the same level.

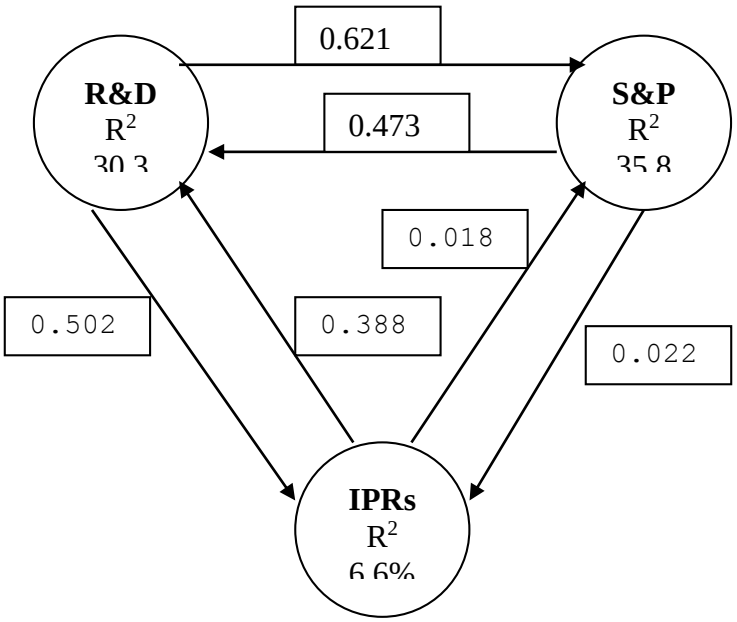
Model (5.3): Structural Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.3) shows that the systems and programs sub-variable has the highest effect among the structural capital sub-variables on JPM Organizations' business performance, where (R^2=35.8 and B=0.421), followed by the research and development sub-variable, where (R^2=30.3 and B=0.305). While the intellectual property rights sub-variable has the lowest effect among all structural capital sub-variables, where (R^2=6.6% and B=-0.043), it has a negative effect on JPM

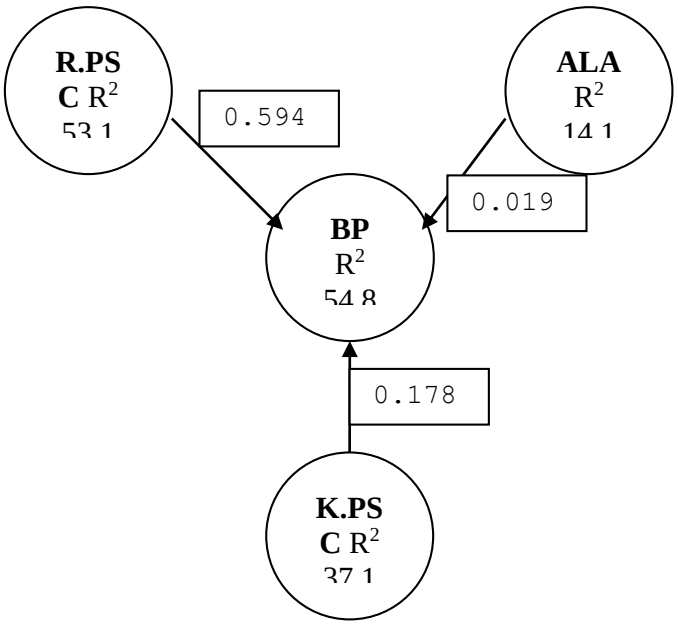
Organizations' business performance. Structural capital sub-variables together explain 40.9% of variance, where (R^2 =40.9%).

Model (5.4): Structural Capital Sub-variables Interaction.



Model (5.4) shows that the correlations and interactions among structural capital sub-variables are varied, the relationship between the systems and programs sub-variable and the research and development sub-variable is high in both directions, where (B=0.621 and B=0.473 respectively), and the relationship between the research and development sub-variable and the intellectual property rights sub-variable is also high in both directions, where (B=0.338 and B=0.502, respectively). While the relationship between the systems and programs sub-variable and the intellectual property rights sub-variable (B=0.018 and B=0.022, respectively) is very week in both directions.

Model (5.5): Relational Capital Sub-variables Effect on JPM Organizations' Business Performance.

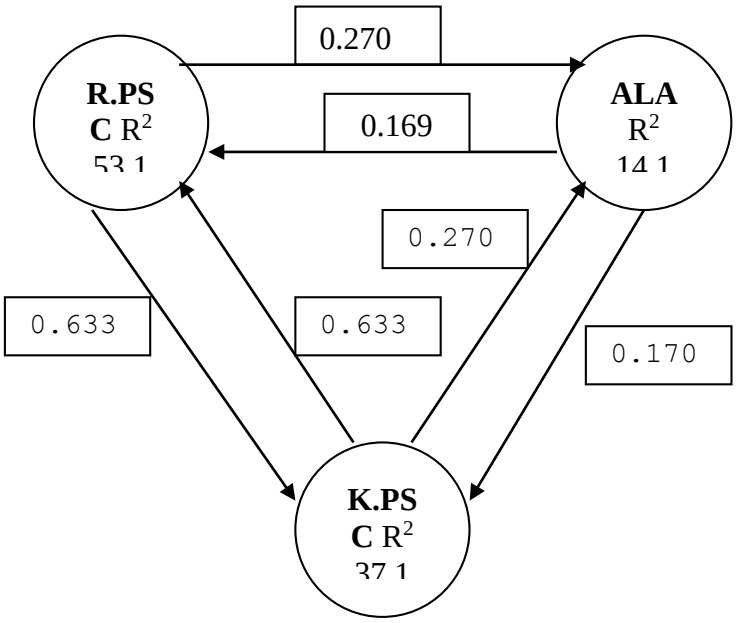


Model (5.5) shows that the relation with partners, suppliers and customers sub-variable has the highest effect among the relational capital sub-variables on JPM Organizations' business performance, where (R^2=53.1 and B=0.594), followed by the knowledge about partners, suppliers and customers sub-variable, where (R^2=37.1 and B=0.178). While the alliances, licensing and agreement sub-variable has the lowest effect among all relational capital sub-variables, where (R^2=14.1 and B=0.019). Relational capital sub-variables together explain 54.8% of variance, where (R^2 =54.8%).

Model (5.6) shows that the correlations and interactions among relational capital sub-variables are varied. The relationship between the relations with partners, suppliers and customers sub-variable and the knowledge about partners,

suppliers and customers sub-variable is high in both directions, where (B=0.633 and B=0.633, respectively). The relationship between the alliances, licensing and agreements sub-variable and the relations with partners, suppliers and customers sub-variable is moderate relation in both directions, where (B=0.270 and B=0.169, respectively). Finally, the relation between the alliances, licensing and agreements sub-variable and the knowledge about partners, suppliers and customers sub-variable is also moderate relation in both directions, where (B=0.170 and B=0.270, respectively).

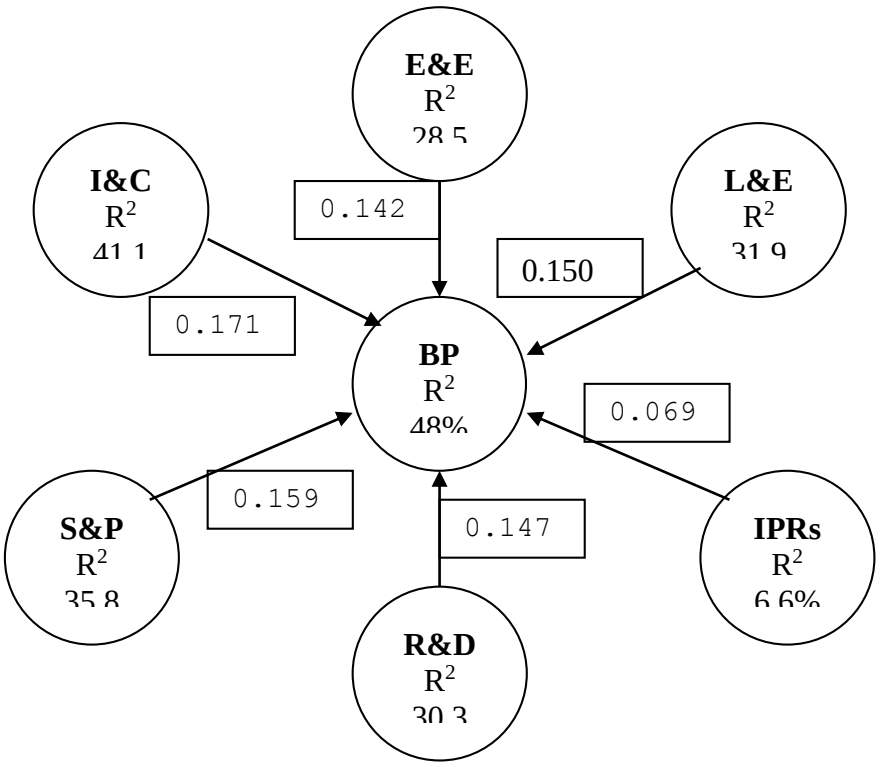
Model (5.6): Relational Capital Sub-variables Interaction.



Model (5.7) shows relationship between human and structural capital sub-variables with JPM Organizations' business performance. The innovation and creation sub-variable has the highest effect on JPM Organizations' business performance, where (R^2=41.1% and B=0.171), followed by the systems and programs sub-variable, where (R^2=35.8% and B=0.159),

the learning and education sub-variable, where (R^2=31.9% and B=0.150), the research and development sub-variable, where (R^2=30.3% and B=0.147), the experience and expertise sub-variable, where (R^2=28.5% and B=0.142). While the intellectual property rights sub-variable has the lowest effect among all human and structural capital sub-variables, where (R^2=6.6% and B=0.069). Human capital and structural capital sub-variables together explain 48% of variance, where (R^2=48%).

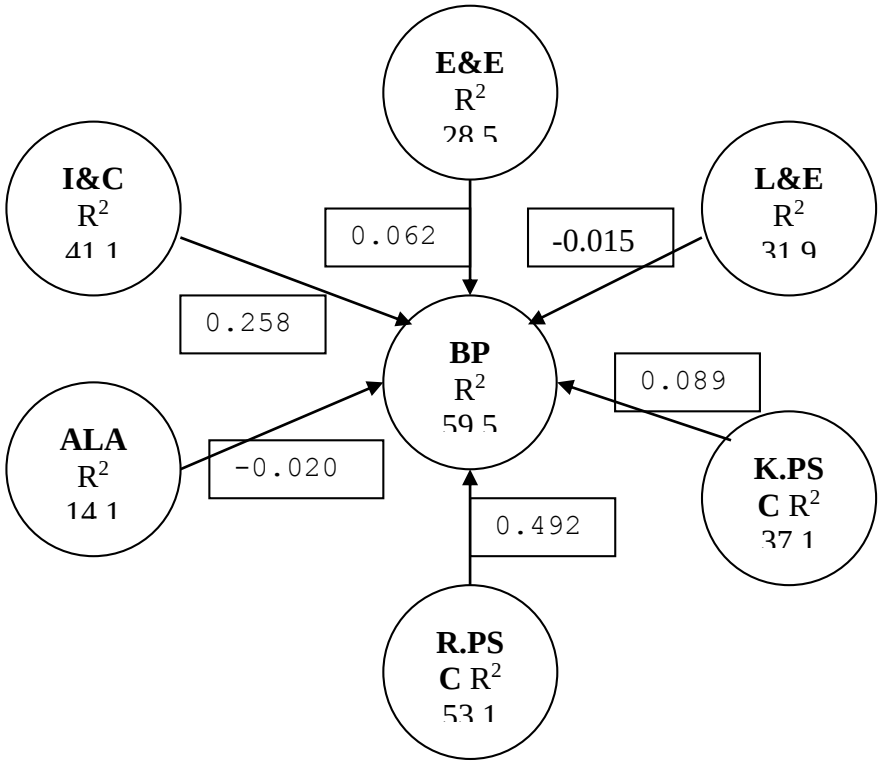
Model (5.7): Human and Structural Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.8) shows the relationship between human and relational capital sub-variables with JPM Organizations' business performance. The relations with partners, suppliers and customers sub-variable has the highest effect on JPM Organizations' business performance,

where (R^2=53.1 and B=0.492), followed by the innovation and creation sub-variable, where (R^2=0.411 and B=0.258). While the learning and education sub-variable and the alliances, licensing and agreements sub-variable have negative effect, where (R^2=0.319 and B=-0.015) and (R^2=0.141 and B=-0.02), respectively. Human and relational capital sub-variables together explain 59.5% of variance, where (R^2=59.5%).

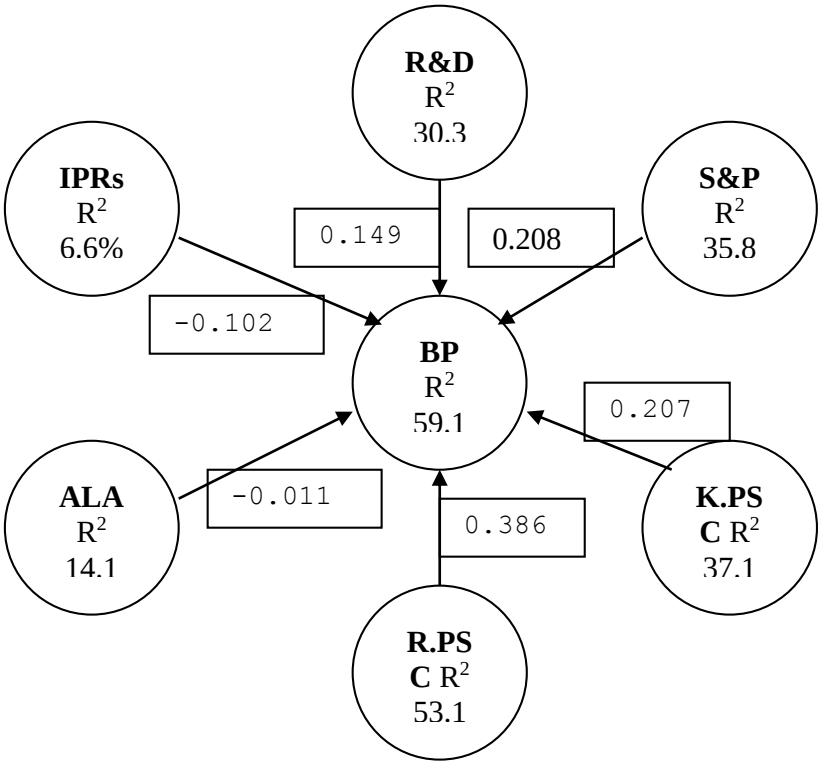
Model (5.8): Human and Relational Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.9) shows the relationship between structural and relational capital sub-variables with JPM Organizations' business performance. The relations with partners, suppliers and customers' sub-variable has the highest effect on JPM Organizations' business performance,

where (R^2=0.531 and B=0.386), followed by the systems and programs sub-variable, where (R^2=0.358 and B=0.208). While the alliances, licensing and agreements sub-variable and the intellectual property rights sub-variable have the lowest effect, where (R^2=0.141 and B=-0.011), and (R^2=0.660 and B=-0.102), respectively. Structural capital and relational capital sub-variables together explain 59.1% of variance, where (R^2=59.1%).

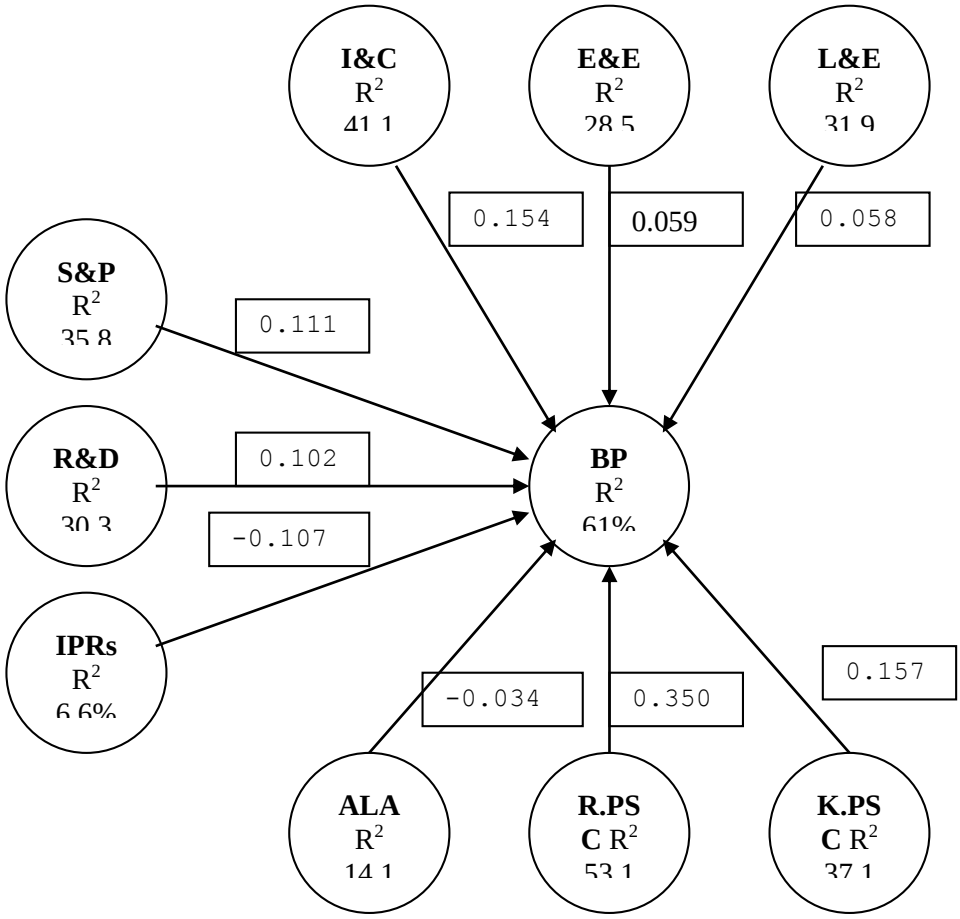
Model (5.9): Structural and Relational Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.10) shows the relationship between human, structural and relational capital sub-variables together with JPM Organizations' business performance. The relations with partners, suppliers and customers' sub-variable has the highest effect on JPM Organizations' business performance,

(R^2=0.531 and B=0.350), followed by the knowledge about partners, suppliers and customers sub-variable, where (R^2=0.371 and B=0.157). While the alliances, licensing and agreements sub-variable and the intellectual property rights sub-variable have the lowest effect, where (R^2=0.141 and B=-0.034) and (R^2=0.660 and B=-0.107), respectively. Human, structural and relational capital sub-variables together explain 61% of variance, where (R^2=61%).

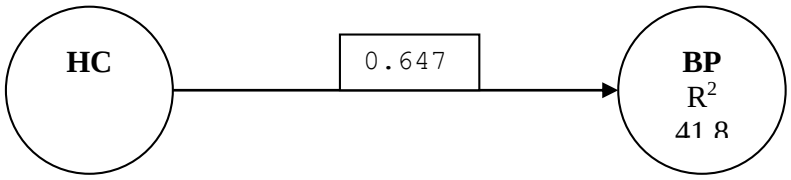
Model (5.10): Human, Structural and Relational Capital Sub-variables Effect on JPM Organizations' Business Performance



Model (5.11) shows that when human capital regressed separately against JPM Organizations' business performance, the relation between them is strong,

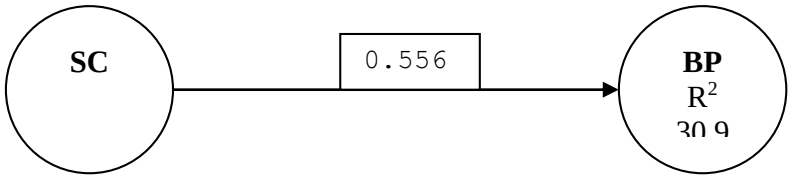
where (beta=0.647). Whereas human capital alone explains 41.8% of the JPM Organizations' business performance variance.

Model (5.11): Human Capital Regressed Separately Against JPM Organizations' Business Performance



Model (5.12) shows that when structural capital regressed separately against JPM Organizations' business performance, the relation is strong, where (beta=0.556). Whereas structural capital alone explains 30.9% of the JPM Organizations' business performance variance.

Model (5.12): Structural Capital Regressed Separately Against JPM Organizations' Business Performance

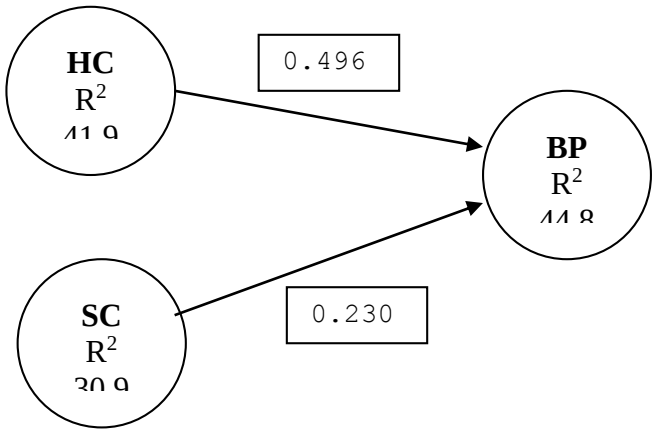


Model (5.13) shows that when relational capital regressed separately against JPM Organizations' business performance, the relation is strong, where (beta=0.671). Whereas relational capital alone explains 45% of the JPM Organizations' business performance variance.

Model (5.13): Relational Capital Regressed Separately Against JPM Organizations' Business Performance

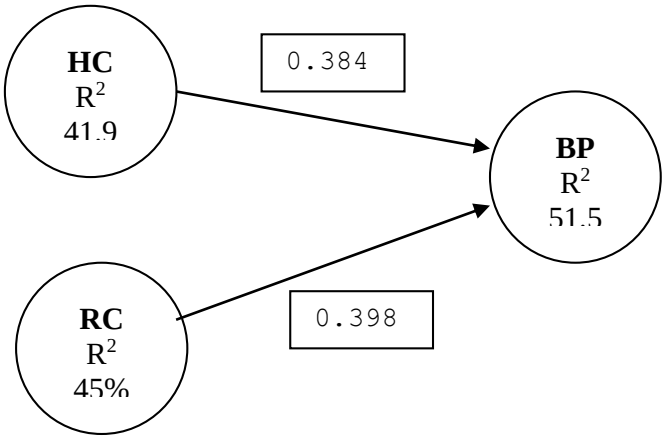
Model (5.14) shows the relation between human and structural capital with JPM Organizations' business performance. Human capital has more effect on JPM Organizations' business performance, where (R^2=41.9% and B=0.496), than structural capital, where (R^2=30.9% and B=0.230), which has moderate effect. Both together can explain 44.9% of the variance, where (R^2=44.8%).

Model (5.14): Human and Structural Capital Effect on JPM Organizations' Business Performance



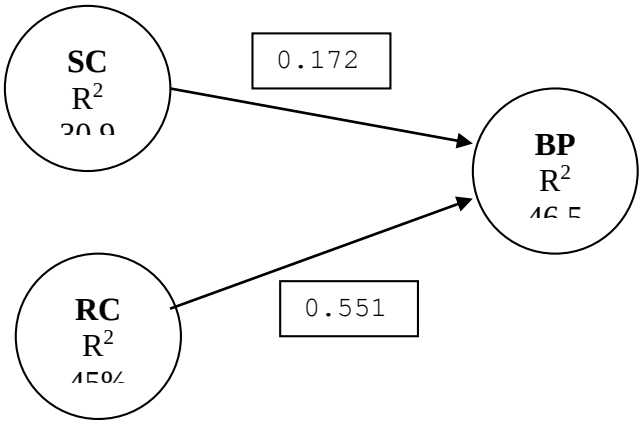
Model (5.15) shows the relation between human and relational capital with JPM Organizations' business performance. Relational capital has slightly more effect on JPM Organizations' business performance than human capital, where (R^2=45% and B=0.398) and (R^2=41.9% and B=0.384), respectively. Both together can explain 51.5% of the variance, where (R^2=51.5%).

Model (5.15): Human and Relational Variables Effect on JPM Organizations' Business Performance



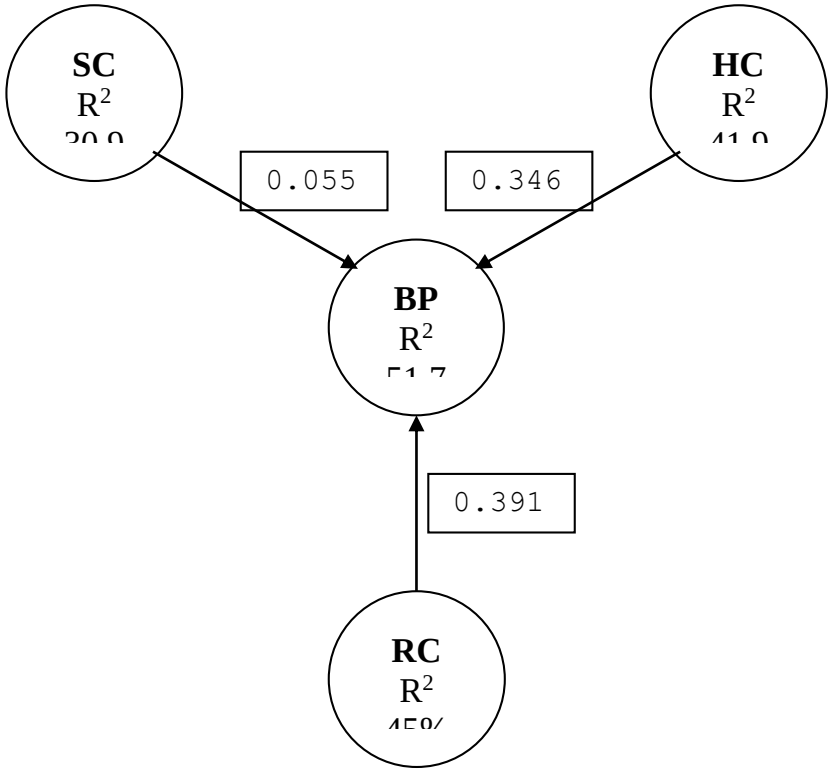
Model (5.16) shows the relation between structural and relational capital with JPM Organizations' business performance. Relational capital has higher effect on JPM Organizations' business performance than structural capital, where (R^2=45% and B=0.551) and (R^2=30.9% and B=0.172), respectively. Both together can explain 46.5% of the variance, where (R^2=46.5%).

Model (5.16): Structural and Relational Capital Effect on JPM Organizations' Business Performance



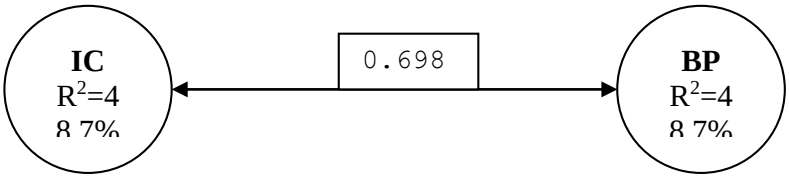
Model (5.17) shows the relation between human, structural and relational capital with JPM Organizations' business performance. Relational capital has the highest effect on JPM Organizations' business performance among them, where (R^2=45% and B=0.391), then human capital, where (R^2=41.9% and B=0.346). While structural capital has the lowest effect, where and (R^2=30.9% and B=0.055). The three intellectual capital components together can explain 51.7% of the variance, where (R^2=51.7%).

Model (5.17): Human, Structural and Relational Capital Variables Effect on JPM Organizations' Business Performance



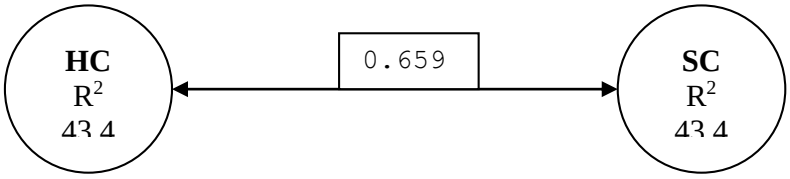
Model (5.18) shows that when the total intellectual capital regressed against JPM Organizations' business performance, the total has very strong effect on the JPM Organizations' business performance, where (R^2=48.7% and B=0.698).

Model (5.18): Total Intellectual Capital Regressed Against JPM Organizations' Business Performance



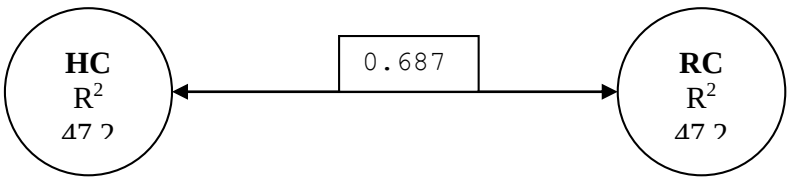
Model (5.19) shows that when human and structural capital regressed against each other, the relation between them is strong, where B=0.659.

Model (5.19): Human Capital and Structural Capital Regressed Against each other



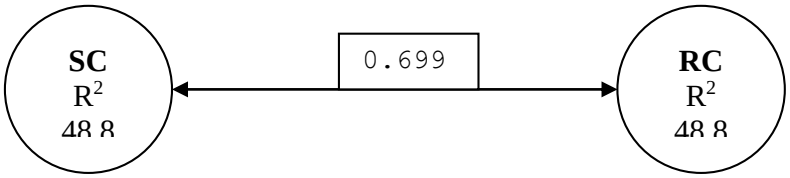
Model (5.20) shows that when human and relational capital regressed against each other, the relation between them is strong, where B=0.687.

Model (5.20): Human Capital and Relational Capital Regressed Against each other



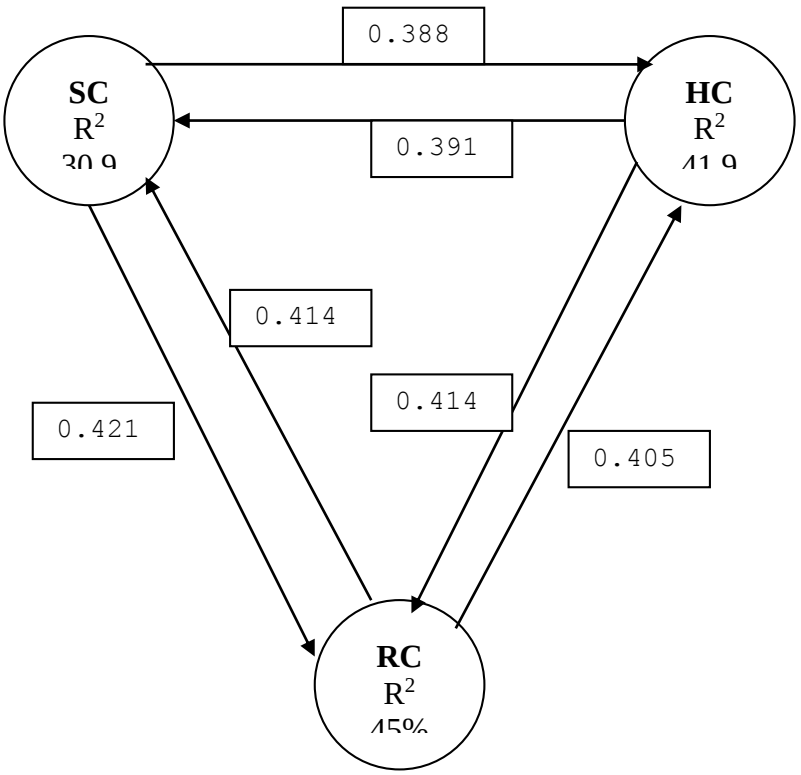
Model (5.21) shows that when structural and relational capital regressed against each other, the relation between them is strong, where B=0.699.

Model (5.21): Structural Capital and Relational Capital Regressed Against each other

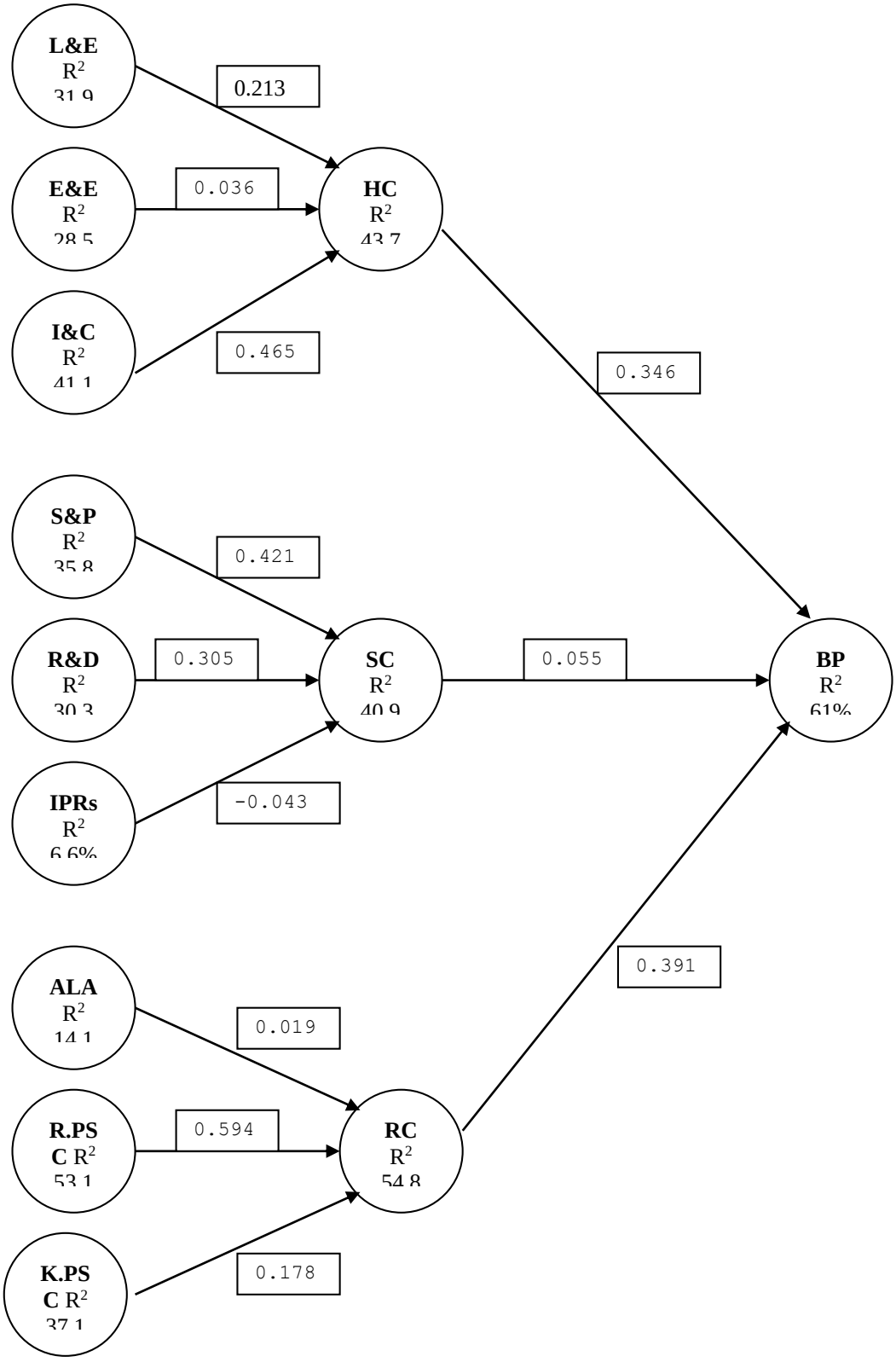


Model (5.22) when two variables regressed against the remaining variable, the results show that the correlation between human and structural capital is strong in both directions, and between human and relational capital is strong in both directions. Finally the relation between structural and relational capital is also strong in both directions.

Model (5.22): Human, Structural and Relational Capital Variables Relationships and Interactions



Model (5.23): Summary of Intellectual Capital Sub-variables Effect on JPM Organizations' Business Performance (Cause-Effect Relationship).



The results show that when the total intellectual capital is regressed against JPM Organizations' business performance R^2 equals 0.487, in both PLS and multiple regression analysis. When intellectual capital variables together are regressed against JPM Organizations' business performance R^2 equals 0.517, in both models. Also when intellectual capital sub-variables together are regressed against JPM Organizations' business performance R^2 equals 0.610, in both models. But, when intellectual capital items (questions) together are regressed against JPM Organizations' business performance, R^2 equals 0.865 in PLS analysis, while multiple regression shows R^2 equals 0.930.

This result indicates that as much as the items are grouped together, the R^2 will be increased and the explanation power will be also increased. However, if all items are regressed against JPM Organizations' business performance the explanation power is increased. As shown above the multiple regression does not avoid the multi-collinearity when the intellectual capital items regressed against JPM Organizations' business performance, where R^2=0.930, while PLS allowed to avoid the multi-collinearity, where R^2=0.865. This indicates PLS is more accurate and allowed to avoid multi-collinearity, even if it is minor, and allowed to maximize the variance to explain endogenous model's constructs.

Chapter Six

Data Results Discussion

The main concern of this chapter is to discuss and evaluate the study results that examine the effect of intellectual capital elements on JPM Organizations' business performance. The chapter also presents the conclusion of the study, followed by its contribution to individuals, organizations and society in general, and to academic researchers and managerial practitioners in particular. Finally, the chapter suggests some recommendations for JPM Organizations, government & society and future research.

6.1. Demographic Results Discussion:

T-test results show that there was no significant difference between the means of both genders. Males have registered higher responses than females regarding most of the variables and sub-variables. Accordingly, such results might indicate that male managers perceive higher level of presence of intellectual capital within JPM Organizations than female managers do. These results are in line with Bin Ismail (2005) study. The researcher believes that there are similarities between Jordanian and Malaysian culture regarding to gender, more than 95% of their society are Muslims, and both societies are masculine in nature. There was also significant difference between the means of both public and private sectors regarding structural capital. Managers' perceptions at public organizations regarding the implementation of intellectual capital items were higher than those of private organizations for most sub-variables.

The results of one way ANOVA test show that there were significant differences among the means of age groups regarding the implementation of intellectual capital items, ($F=3.910$; $P < 0.05$). It seems that managers with higher age perceive that JPM Organizations have a higher level of presence of intellectual capital than younger managers do. There were no significant differences among the means of age groups regarding other intellectual capital and business performance variables. These results are not in line with Bin Ismail (2005) study results. The difference may be related to type of industry included in each study.

Again One way ANOVA test results show that there were significant differences among the means of qualification groups regarding the implementation of intellectual capital items, ($F=3.586$; $P < 0.05$). It seems that the higher qualification holders perceive that JPM Organizations have higher level of presence of intellectual capital than lower qualification holders do. Higher qualifications are involved in research and development. This allows them to appreciate the nature of intellectual capital, due to the various functions carried out by such managers. These results are contradicting with Bin Ismail (2005) study results. This may be due to the type of industry included in both studies. In addition, one way ANOVA test results show that there were significant differences among the responses of experience groups regarding the implementation of intellectual capital items, ($F=4.129$; $P < 0.05$).

It seems that managers of longer experience perceive that JPM Organizations have higher level of presence of intellectual capital than managers of shorter experience do. These results are in line with Bin Ismail (2005) study. The researcher believes that this is normal and logical among employees with high level of experience.

Finally, the results of one way ANOVA test show that there were significant differences among the responses of the department groups regarding the implementation of intellectual capital items, ($F=4.502$; $P < 0.05$). It seems that those who are working in administrative departments perceived that JPM Organizations have higher level of presence of intellectual capital than those in the production and marketing departments, respectively. These results match with Bin Ismail (2005) study results, which indicated that executives of telecommunication industry feel higher presence of intellectual capital than others do. This may be due to the fact that the managers who work in the administrative departments have more knowledge about the organization than those who work in other departments.

6.2. Dependent and Independent Variables Results Discussion:

Dependent Variable (Business Performance Indicators):

Results in table (5.14 p.119) indicate that there is a significant role of the business performance indicators, where ($t=8.173 > 1.645$). Evidence seems to suggest an improvement in JPM Organizations' business performance.

Therefore, the JPM Organizations are directed and strongly leaning toward performance improvement, and the respondents are aware of the role of business performance indicators. As compared with previous studies, table (6.1) shows that Miller (1999) study rated (3.02), Sofian et. al. (2004) study rated (3.20), Bin Ismail (2005) study rated (3.01), and Moslehi et. al. (2006) study rated (2.4).

Table (6.1): Comparison between the Variables Means of Different Studies

Variable	**Current Study**	**Miller et. al. 1999 Canada**	**Berglud et. al. 2002 Sweden**	**Sofian et. al. 2004 Malaysia**	**Bin Ismail 2005 Malaysia**	**Moslehi et. al. 2006 Iran**	**Salleh & Salamat 2007 Malaysia**
Human Capital	3.43	3.63	**3.15**	3.94	3.36	**3.15**	3.71
Structural Capital	**3.06**	**2.80**	**1.85**	3.58	3.39	**2.23**	3.62
Relational Capital	3.45	3.47		3.89	3.36	3.85	3.83
Intellectual Capital	3.32	3.30		3.80	3.37	**3.08**	3.72
Business Performance	3.46	**3.02**		3.20	3.01	**2.4**	

However, these studies were carried out in different countries: Malaysia, Canada and Iran, all of them rated business performance indicators lower than JPM Organizations. Such differences may be due to the fact that the pharmaceutical industry is more knowledge and intellectual capital intensive as compared with other industries.

Intellectual Capital Variables:

Evidence from table (5.1 P.106) results show that there is a significant implementation of the intellectual capital variables, where (t=7.095 > 1.645). Such results seem to suggest that the JPM Organizations implement relational and human capital more than structural capital. It is clear that the respondents are aware of the role of relational and human capital in JPM Organizations' business performance more than structural capital. It appears that the respondents strongly believe that relational and human capital variables affect the JPM Organization's productivity, profitability and market valuation more than structural capital. The reason for this may be related to the low awareness of the role of structural capital in JPM Organizations' business performance and low government support. As shown in table (6.1), the current study results are supported by Miller et. al. (1999), Sofian et. al. (2004), Bin Ismail (2005) and Salleh & Salamat (2007). However Moslehi et. al. (2006) study has rated the lowest among all studies included in table (6.1); this may be due to market monopoly of the Iranian insurance organizations.

Human Capital Sub-variables:

Results in tables (5.1 P.106) and (5.2 P.107) indicate that there is a significant implementation of the human capital sub-variables, where (t=9.589 > 1.645). The results seem to suggest that the JPM Organizations are aware of the role of human capital sub-variables in JPM Organizations' business performance, and have strong interest towards a high level of all human capital sub-variables. Respondents strongly believe that the human capital sub-variables affect JPM Organizations' business performance.

This may be related to Jordanian and Islamic culture that is concerned much about the human being. As compared with previous studies, table (6.1) shows that the current study results are supported by Sofian et. al. (2004) study which rated the highest (3.94), Bin Ismail (2005) study rated (3.36), Salleh and Salamat (2007) study rated (3.71), Miller (1999) study rated (3.63), Moslehi et. al. (2006) study rated (3.15), and Berglud et. al. (2002) study rated (3.15). In addition, the result is supported also by Lim (2002), Kukko (2003), Bollen et. al. (2005), Bontis et. al (2000), Firer and Stainbank (2003) and Tomer (2005).

Learning and Education Sub-variable: The average mean in table (5.3 P.108) shows that there is a significant implementation of the learning and education sub-variable, where (t=11.678 > 1.645). It seems that the respondents are aware of the role of the learning and education in JPM Organizations' business performance, and they believe that learning and education affect JPM Organizations' productivity, profitability and market valuation. Evidence seems to suggest that managers are in different agreement on the implementation of the learning and education sub-variable items: Employees have high competence, and their qualifications are within the industry education average. They cooperate when they work in team tasks, and they continuously learn from each other. Moreover, they try to improve the market share when they are performing their jobs. **However,** they do not have enough continuous knowledge and skills development training programs. This may be due to lack of supporting working environment for employees provided by the management.

The above results are supported by Bin Ismail (2005) study regarding the employee's capabilities and cooperation when they perform their jobs.

Experience and Expertise Sub-variable: Table (5.4 P.109) results show that there is a significant implementation of the experience and expertise sub-variable, where (t=9.906 > 1.645). It seems that the respondents are aware of the role of experience and expertise in JPM Organizations' business performance, and strongly believe that the experience and expertise affect JPM Organizations' productivity, profitability and market valuation. However, evidence seems to suggest that the employees are not in agreement on the implementation of the experience and expertise sub-variable items: They are experts in their jobs, have the efficiency and the required capabilities. They work hard to make their organizations different. What is more, employees consistently perform at their best, and they are professional when they are performing their jobs. **However**, the employees' turnover is high. This may be due to the lack of management support and to the weaknesses of employees' loyalty. The above result is supported by Bin Ismail (2005) study regarding the employees' expertise when they perform their jobs.

Innovation and Creation Sub-variable: Results of table (5.5 P.110) indicate that there is a significant implementation of the innovation and creation sub-variable, where (t=4.880 > 1.645). It appears that the respondents are aware of the role of the innovation and creation in JPM Organizations' business performance, and strongly believe that

the innovation and creation affect JPM Organizations' productivity, profitability and market valuation. Evidence might suggest that employees have some agreement on the implementing of the innovation and creation activities: Employees are creative and bright, and they voice their opinion. **However,** they are not encouraged to bring new ideas or come up with new ideas, with low motivation and commitment to share new ideas. Employees also do not launch high number of new products, and they are not satisfied with innovation policies and programs. This may be due to the lack of management support, and the culture that generally does not support innovation and creation. The above result is supported by Bin Ismail (2005) study regarding the employees idea sharing and practicing creativity, but it is contradicted regarding the employees' innovation and creation when they perform their jobs.

Structural Capital Sub-variables:

Evidence from the table (5.1 P.106) and (5.6 P.111) show that there is a low implementation of the structural capital sub-variables, where ($t=1.034 < 1.645$). It seems that the JPM Organizations have low implementation of all the structural capital sub-variables. It appears that there is low awareness of the role of structural capital in JPM Organizations' business performance and respondents do not strongly believe that structural capital affect JPM Organizations' business performance positively. Results also show that the JPM Organizations have low interest level toward structural capital compared with human and relational capital. At the same time, it seems

that JPM Organizations have more interest towards a high level of research and development and systems and programs than towards intellectual property rights. This may be due to misunderstanding the value of intellectual property rights. As compared with previous studies in table (6.1), the current study result is not in line with Sofian et. al. (2004), Bin Ismail (2005), Salleh and Salamat (2007), because their studies rated higher structural capital than JPM Organizations did. In addition, the results are also contradicted with Firer and Stainbank (2003) and Bollen et. al. (2005), both studies concluded that there was a strong presence of structural capital in German pharmaceutical organizations and South Africa organizations. The difference between the current study and the above-mentioned studies may be due to the fact that Malaysia, Germany and South Africa are more developed countries as compared with Jordan regarding structural capital. Moreover, may be the organizations in these countries receive more government support compared with JPM Organizations. Miller (1999) study conducted in Canada, Berglund et. al. (2002) conducted in Sweden and Moslehi et. al. (2006) in Iran, were rated lower than JPM Organizations regarding structural capital. This may be due to the nature of industries included in each study. The current study results are supported by Bontis (1999), Bontis et. al. (2000), Bontis (2001), Xiaojun (2004), Seng et. al. (2004) and Westhuizen (2005). Though the results show that the JPM Organizations do not place a heavy emphasis on the usefulness of structural capital, they are still better than many other organizations elsewhere.

Systems and Programs Sub-variable: Results from table (5.7 P.112) indicate that there is a significant implementation of the systems and programs sub-variable, where (t=2.897 > 1.645). It appears that the respondents are aware of the role of the systems and programs in JPM Organizations' business performance, and strongly believe that the systems and programs affect JPM Organizations' productivity, profitability and market valuation. Evidence seems to suggest that the employees have a variable agreement on the implementation of the systems and programs sub-variable items: The employees perceive that the organizations are not bureaucratic. **However,** they perceive that the organizations do not apply comprehensive recruitment programs, and the reward system is not related to performance. They perceive that there are no succession-training programs, and low upgrading skills and educational support. Moreover, they have low influence over decisions made. The organizations culture and atmosphere also are not supportive and comfortable. This may be due to the lack of management support, the owners' concern about short-term profit and high return, this also may be related to the culture of competition between individuals and organizations. The above results are contradicting with Bin Ismail (2005) study, in the sense that it rated higher in systems, programs, policies and procedures than JPM Organizations.

Research and Development Sub-variable: Table (5.8 P.113) results show there is a significant implementation of the research and development sub-variable, where (t=2.905 > 1.645).

It appears that the respondents are aware of the role of the research and development in JPM Organizations' business performance, and moderately believe that the research and development affect JPM Organizations' productivity, profitability and market valuation. Evidence seems to suggest that employees have a variable agreement on the implementation of the research and development sub-variable items: The respondents perceive that the organizations' board has low trust in and support to research and development, and there is no appropriate and adequate budget for research and development. Furthermore, organizations do not have systems and programs to support innovation. They also do not continuously develop and re-organize themselves around research and development, and they do not develop work processes continuously. Moreover, they do not follow up and adopt the latest scientific and technical development, and they are not research leaders. Although, the JPM Organizations are heavily weighted with professional and technical staff, this may be due to the lack of the board support, and there is no strong relation between academic institutions and pharmaceutical organizations (basic and secondary research). At the same time, research and development need high investment that might be not available and the return from research and development may come late or even do not come at all from some researches. Finally, it seems that the government policies, systems and programs do not support the research and development, which are considered as crucial for research and development. The above results are contradicting with Bollen et. al (2005), and Chen (2004),

where German pharmaceutical organizations and Taiwan's pharmaceutical organizations oversee the importance of research and development, and they have strategies to develop it. It seems that these two countries are more developed and have more government support than the JPM Organizations.

Intellectual Property Rights Sub-variable: Results from table (5.9 P.114) indicate that there is no significant implementation of the intellectual property rights sub-variable, where ($t=-2.544 < 1.645$). It seems that JPM Organizations are neither aware of the role of the intellectual property rights in JPM Organizations' business performance, nor they believe that the intellectual property rights affect JPM Organizations' productivity, profitability and market valuation positively.

Evidence seems to suggest that the respondents have variable agreement on the implementation of the intellectual property rights sub-variable items. They agree on the fact that JPM Organizations have low implementation of all sub-variable items: The organizations do not set clear strategies and procedures for intellectual property rights, and they do not monitor intellectual property rights portfolio. Additionally, they do not pursue a multiple strategy of licensing intellectual property rights. What is more, they do not encourage and reward creation. Moreover, intellectual property rights are not considered for value creation. They also do not utilize intellectual property rights to maximum level, and they do not have high number of intellectual property rights.

The researcher believes that although the Jordanian pharmaceutical manufacturing industry is heavily weighted with professional and technical staff, this may be due to the nature of generic industry and the absence of intellectual property rights rules. This may also be due to the lack of the JPM Organizations board support and misunderstanding the value of intellectual property rights. Intellectual property rights need strong research and development department which most of the JPM Organizations do not have. The government policies, systems and programs seem not to be supportive.

The above results are contradicting with Bollen et. al (2005) study, which included German pharmaceutical organizations, Chen (2004) which included Taiwan's pharmaceutical organizations and Gallego & Rodrygues (2005) which included Spanish software organizations. Organizations involved in these studies oversee the importance of research & development and intellectual property rights, and they have strategies for both of them. It seems that these three countries are more developed and they have more governmental support than JPM Organizations.

Relational Capital Sub-variables:

Evidence from tables (5.1 P.106) and (5.10 P.115) show that there is a significant implementation of the relational capital sub-variables, where (t=9.447 > 1.645). Evidence seems to suggest that the JPM Organizations are implementing all the relational capital sub-variables.

It appears that the respondents are aware of the role of relational capital sub-variables in JPM Organizations' business performance and they strongly believe that the relational capital sub-variables affect JPM Organizations' business performance positively. It seems that the JPM Organizations have a strong interest towards a high level of all relational capital sub-variables.

Table (6.1) shows that Sofian et. al. (2004), Bin Ismail (2005), Salleh and Salamat (2007), Miller (1999), and Moslehi et. al. (2006) support the current study results. Moreover, Bontis (1999), Bontis (2001), Bontis et. al. (2000), Westhuizen (2005), Bollen et. al. (2005) Chen (2004), Gallego & Rodrygues (2005) and Firer & Stainbank (2003) results also support the current study results. It seems that almost all organizations regardless of the industry type, country or culture perceive the importance of the relational capital over the human and the structural capital. The result shows that the JPM Organizations place a heavy emphasis on the usefulness of the relational capital as much as all other organizations elsewhere.

Alliances, Licensing and Agreements Sub-variable: Table (5.11 P.116) results indicate that there is a significant implementation of the alliances, licensing and agreements sub-variable, where ($t=5.993 > 1.645$). It appears that the respondents are aware of the role of the alliances, licensing and agreements in JPM Organizations' business performance, and strongly believe that the alliances, licensing and agreements affect JPM Organizations' productivity, profitability and market valuation.

Evidence seems to suggest that the respondents have a variable agreement on the implementation of the alliances, licensing and agreements sub-variable items: They perceive that the JPM Organizations have diverse distribution channels, and they are able to learn and add value through partners. Moreover, they work in joint projects, and they are partnership orientated. **However,** they may not consult outsiders for decision-making, and they do not have many and diverse alliances; at the same time, they have low ratio of business with strategic alliances. This may be due to the lack of good planning, and low trust in alliances. In addition, government's policies, systems and programs also may not facilitate and/or support strategic alliances. Finally, the culture itself does not encourage alliances especially among local JPM Organizations. Bin Ismail (2005) and Heimeriks & Duysters (2003) work support the above results.

Relations with Partners, Suppliers and Customers Sub-variable: Results from table (5.12 P.117) indicate that there is a significant implementation of the relations with partners, suppliers and customers sub-variable, where (t=11.136 > 1.645). It appears that the respondents are aware of the role of the relations with partners, suppliers and customers in JPM Organizations' business performance, and strongly believe that the relations with partners, suppliers and customers affect JPM Organizations' productivity, profitability and market valuation. The results also show that they have strong interest towards the relations with partners, suppliers and customers' sub-variable.

Evidence seems to suggest that though the employees have a variable agreement on the implementation of the relations with partners, suppliers and customers sub-variable items, all items rated average means: Respondents believe that the organizations are devoting considerable time to select suppliers, and they are maintaining long standing relationship with suppliers. They also believe that the customers will continue to do business with their organizations, and their customers are increasingly selecting organization's products. Moreover, they are capitalizing on customers' wants and needs, and they reduce the time to resolve a customer's problems. Finally, they believe that their customers are loyal and satisfied. This may be due to the culture that encourages relations in general. The employees also believe that good relations with customers create sale. The above result is supported by Bin Ismail (2005), Miller et. al. (1999), Cuganesan (2005), Salleh & Salamat (2007), Bollen et. al. (2005) and Moslehi et. al. (2006).

Knowledge about Partners, Suppliers and Customers Sub-variable: In table (5.13 P.118), results show that there is a significant implementation of the knowledge about partners, suppliers and customers sub-variable, where ($t=6.870 > 1.645$). It appears that the respondents are aware of the role of the knowledge about partners, suppliers and customers in JPM Organizations' business performance, and strongly believe that the knowledge about partners, suppliers and customers' affect JPM Organizations' productivity, profitability and market valuation.

Evidence seems to suggest that the respondents have variable agreement on the implementation of the knowledge about partners, suppliers and customers' sub-variable items: The organizations have complete data about suppliers, and share the knowledge with partners. In addition, they believe that the customers' data are continuously updated, and their organizations are concerned about the feedback from the customers. At the same time, they continually meet with customers to find needs and wants. **However,** they believe that their organizations do not have a useful and updated information system. Additionally, customers' knowledge is not widely distributed. This may be due to the lack of the JPM Organizations' board support. The modern updated infrastructure such as internet and computers is not widely used and it needs investment on information systems.

The above result is supported by Bollen et. al. (2005), Sofian et. al. (2004), Miller et. al. (1999), Moslehi (2006) and Salleh & Salamat (2007). Also Bin Ismail (2005) study is supporting the current study results regarding the lack of an updated information system and customers' knowledge that are not widely distributed, but contradicting with current study regarding the feedbacks from the suppliers and customers to provide quality service and the use of customers' profiles which are more used in the JPM Organizations than those of Malaysian Telecommunication organizations.

6.3. Hypothesis Analysis Results Discussion:

6.3.1. Human Capital Sub-variables:

The result of the multiple regressions analysis in table (5.27 P.142) and (5.28 P.143) show that the null hypothesis is rejected and the alternative hypothesis is accepted, this states that human capital sub-variables affect JPM Organizations' business performance, where (R^2=0.437, F=33.142, Sig. =0.000) and indicates that the three human capital sub-variables explained 43.7% of the variance. They also show that the innovation and creation sub-variable has the highest effect on JPM Organizations' business performance, followed by the learning and education sub-variable. While the experience and expertise sub-variable does not have significant effect on JPM Organizations' business performance.

Multiple regressions analysis results in table (5.28 P.143) shows that:

1.1. Learning and Education Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the learning and education sub-variable positively and directly affects JPM Organizations' business performance at α =0.05.

1.2. Experience and Expertise Sub-variable: The null hypothesis is accepted which indicates that the experience and expertise sub-variable does not positively and directly affect JPM Organizations' business performance at α =0.05.

1.3. Innovation and Creation Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the innovation and creation sub-variable positively and directly affects JPM Organizations' business performance at α =0.05.

The above results are supported by the stepwise regression tables (5.29 P.145), (5.30 P.146) and PLS & Path Analysis model (5.1 P.170). They show that the innovation and creation sub-variable has the highest effect on JPM Organizations' business performance and has a positive direct relation with JPM Organizations' business performance. Followed by the learning and education sub-variable, which has a positive direct relation with JPM Organizations' business performance. While the experience and expertise sub-variable has the lowest impact on JPM Organizations' business performance.

6.3.2. Structural Capital Sub-variables:

The results of the multiple regressions analysis in tables (5.32 P.150) and (5.33 P.150) show that the null hypothesis is rejected and the alternative hypothesis is accepted, which states that structural capital sub-variables affect the JPM Organizations' business performance, where (R^2=0.409, F=29.53, Sig.=0.000) indicates that the three sub-variable together explained 40.9% of the variance.

They also show that the systems and programs sub-variable has the highest effect on JPM Organizations' business performance, followed by the research and development sub-variable. While the intellectual property rights sub-variable does not significantly (negative) affect JPM Organizations' business performance.

Multiple regressions analysis results table (5.33 P.150) shows that:

2.1. Systems and Programs Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the systems and programs sub-variable positively and directly affects JPM Organizations' business performance at α =0.05.

2.2. Research and development Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the research and development sub-variable positively and directly affect JPM Organizations' business performance at α =0.05.

2.3. Intellectual Property Rights Sub-variable: The null hypothesis is accepted which indicates that the intellectual property rights sub-variable does not affect JPM Organizations' business performance at α =0.05.

The above results are supported by the stepwise regression tables (5.34 P.153), (5.35 P.154) and PLS & Path Analysis Model (5.3 P.172). They show that the systems and programs sub-variable has the highest effect on JPM Organizations' business performance, and has a positive direct relation with JPM Organizations' business performance, followed by the research and development sub-variable, which has a positive direct relation with JPM Organizations' business performance. While the intellectual property rights sub-variable has the lowest effect among the three. It has a negative effect on JPM Organizations' business performance.

6.3.3. Relational Capital Sub-variables:

The results of the multiple regression analysis tables (5.37 P.157) and (5.38 P.158) show that the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that relational capital sub-variables affect JPM Organizations' business performance, where (R^2=0.548, F=51.788, Sig.=0.000). It also shows that the three relational capital sub-variables together explained 54.8% of the variance. They also show that the relations with partners, suppliers and customers sub-variable has the highest effect on JPM Organizations' business performance, followed by the knowledge about partners, suppliers and customers sub-variable. While the alliance, licensing and agreements sub-variable does not have significant effect on JPM Organizations' business performance.

The result of the multiple regressions table (5.38 P.158) shows that:

3.1. Alliances, Licensing and Agreements Sub-variable: The null hypothesis is accepted which indicates that the alliances, licensing and agreements sub-variable does not affect JPM Organizations' business performance at α =0.05.

3.2. Relations with Partners, Suppliers and Customers' Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the relations with partners, suppliers and customers sub-variable affects JPM Organizations' business performance at α =0.05.

3.3. Knowledge about Partners, Suppliers and Customers' Sub-variable: The null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the knowledge about partners, suppliers and customers sub-variable affects JPM Organizations' business performance at $\alpha = 0.05$.

The above results are supported by the stepwise regression tables (5.39 P.160), (5.40 P.161) and PLS & Path Analysis model (5.5 P.174). They show that the relation with partners, suppliers and customers' sub-variable has the highest effect on JPM Organizations' business performance and has a positive direct relation with JPM Organizations' business performance, followed by the knowledge about partners, suppliers and customers' sub-variable, which has a positive direct relation with JPM Organizations' business performance. While the alliances, licensing and agreement sub-variable has the lowest effect among the three.

First model of sequential regressions table (5.45 P.167) including human capital sub-variables shows that the most important sub-variable is the innovation and creation sub-variable, followed by the learning and education sub-variable, while the experience and expertise sub-variable is not significant for JPM Organizations' business performance. The second model of sequential regressions (after adding the structural capital sub-variables to first model) shows the importance of the innovation and creation sub-variable, followed by the research and development sub-variable, while the other sub-variables show little importance (not significant)

for JPM Organizations' business performance, except the intellectual property rights sub-variable which shows a negative impact on JPM Organizations' business performance. The third model of sequential regressions (after adding relational capital sub-variables to the second model) shows that the most important and highly significant sub-variable is the relations with partners, suppliers and customers' sub-variable, while the learning and education sub-variable, the intellectual property rights sub-variable and the alliances, licensing and agreements sub-variable have a negative impact on JPM Organizations' business performance. The remaining sub-variables show a little importance or impact on the JPM Organizations' business performance.

6.3.4. Relationships between Intellectual Capital Sub-variables and JPM Organizations' Business Performance

The Pearson correlation matrix table (5.25 P.133) shows that the relationship between human capital sub-variables and the JPM Organizations' business performance is strong, where r (0.534 to 0.641). The matrix also shows that the relationship between relational capital sub-variables and JPM Organizations' business performance is strong, where r (0.375 to 0.729). Finally, it shows that the relationship between structural capital sub-variables and JPM Organizations' business performance is varied, where r (0.258 to 0.598).

PLS and Path analysis model (5.7 P.176) shows that human and structural capital sub-variables regressed against JPM Organizations' business performance.

The innovation and creation sub-variable has the highest effect on JPM Organizations' business performance, followed by the systems and programs sub-variable, the learning and education sub-variable, the research and development sub-variable, the experience and expertise sub-variable, respectively. While the intellectual property rights sub-variable has the lowest effect among all. Human and structural capital sub-variables together explain 48% of variance. PLS and Path analysis model (5.8 P.177) shows that human and relational capital sub-variables regressed against JPM Organizations' business performance. The relations with partners, suppliers and customers sub-variable has the highest effect on JPM Organizations' business performance, followed by the innovation and creation sub-variable. While the learning and education sub-variable and the alliances, licensing and agreements sub-variable have negative effect on JPM Organizations' business performance. Human capital and relational capital sub-variables together explain 59.5% of variance.

PLS and Path analysis model (5.9 P.178) shows that structural and relational capital sub-variables regressed against JPM Organizations' business performance. The relations with partners, suppliers and customers' sub-variable has the highest effect on JPM Organizations' business performance, followed by the systems and programs sub-variable. While the alliances, licensing and agreements sub-variable and the intellectual property rights sub-variable have the lowest effect. Structural and relational capital sub-variables together explain 59.1% of variance, where (R^2=59.1%). PLS and Path analysis model (5.10 P.179)

shows that human, structural and relational capital sub-variables together regressed against JPM Organizations' business performance. The relations with partners, suppliers and customers' sub-variable has the highest effect on JPM Organizations' business performance, followed by the knowledge with partners, suppliers and customers' sub-variable. While the alliances, licensing and agreements sub-variable and the intellectual property rights sub-variable have the lowest effect (negative effect) on JPM Organizations' business performance. Human, structural and relational capital sub-variables together explain 61% of variance, where (R^2=61%).

6.3.5. The Main Hypothesis: Intellectual Capital variables:

The results of the multiple regressions analysis tables (5.42 P.165) and (5.43 P.165) show that the null hypothesis is rejected and the alternative hypothesis is accepted, which indicates that the intellectual capital variables affect the JPM Organizations' business performance, where (R^2 =0.517, F=45.597, Sig.=0.000) and indicate that the three variables together explained 51.7% of the variance. The results also show that relational capital variable has the highest effect on JPM Organizations' business performance, followed by human capital variable, which has a positive direct effect on JPM Organizations' business performance. While structural capital variable does not have a significant positive impact on JPM Organizations' business performance.

The sequential regressions model table (5.44 P.166) supports the above results. It shows that in the first model of sequential regression, human capital variable has 0.437 percent effect on the JPM Organizations' business performance. The second model of sequential regression shows that after adding structural capital variable to the first model, the effect was 0.480 percent, which means that the importance of the second variable equals R^2 change i.e. 0.043. The third model of sequential regression shows that after adding relational capital variable to the second model, the effect was 0.610 percent, which means that the importance of the third variable equals R^2 Change i.e. 0.130. It shows that structural capital added only 0.043 i.e. the lowest effect.

6.3.6. Relationships between Intellectual Capital Variables and JPM Organizations' Business Performance.

Pearson correlation matrix table (5.25 P.133) shows that there is a very strong relationship between human capital variable and JPM Organizations' business performance, where r (0.647). It also shows there is a strong relationship between structural capital variable and JPM Organizations' business performance, where r (0.557). Moreover, it shows that there is a very strong relationship between relational capital variable and JPM Organizations' business performance, where r (0.670). Finally, it shows that there is a very strong relationship between intellectual capital and JPM Organizations' business performance, where r (0.698).

Table (6.2) and PLS & path analysis model (5.11 P.180) shows that human capital regressed separately against JPM Organizations' business performance, the relation between them is strong, and human capital alone explains 41.9% of the variance. Model (5.12 P.180) shows that structural capital regressed separately against JPM Organizations' business performance, the relation is strong, and structural capital alone explains 30.9% of the variance. Model (5.13 P.181) shows that relational capital regressed separately against JPM Organizations' business performance, the relation is strong, and relational capital alone explains 45% of the variance. The above results are supported by Bollen et. al. (2005) and Bin Ismail (2005).

Table (6.2): Correlation (R^2) Between Intellectual Capital Variables and Business Performance for Different Studies

Variable	Current Study PLS**	Current Study M.Reg*	Bontis 1999	Bollen et. al. 2005	Bin Ismail 2005	Wang Chang 2005
HC	0.419	0.437		0.522	0.344	
SC	0.309	0.409	**0.245**	0.535	0.337	
RC	0.450	0.548	**0.249**	0.455	0.401	0.483
BP (IP)	0.517	0.517	0.560	0.192	0.568	0.528

***** M.Reg.: Multiple Regressions

** PLS: Partial Least Squares

Model (5.14 P.181) shows that when human and structural capital variables are regressed against JPM Organizations' business performance,

the human capital has more effect on JPM Organizations' business performance than structural capital. Both together can explain 44.9% of the variance. Model (5.15 P.182) shows that when human and relational capital variables regressed against JPM Organizations' business performance. Relational capital has slightly more effect on JPM Organizations' business performance than human capital. Both together can explain 51.5% of the variance. Model (5.16 P.182) shows that structural and relational capital variables regressed against JPM Organizations' business performance. Relational capital variable has much more effect than structural capital variable on JPM Organizations' business performance. Both together can explain 46.5% of the variance. Model (5.17 P.183) shows that the human, structural and relational capital variables regressed against JPM Organizations' business performance. Relational capital variable has the highest effect on JPM Organizations' business performance, then human capital. While structural capital variable has the lowest effect on JPM Organizations' business performance. The three intellectual capital components together can explain 51.7% of the variance. Model (5.18 P.184) shows that when total intellectual capital regressed against JPM Organizations' business performance, the total has very strong effect on the JPM Organizations' business performance, which can explain 69.8% of the variance.

The above results indicated that relational capital is the most important variable. The results are supported by Bin Ismail (2005), Salleh & Salamat (2007) and Moslehi et. al. (2006) as indicated in tables (6.1).and (6.2). However,

Miller et. al. (1999), Berglud et. al. (2002) and Sofian et. al. (2004) indicated that the human capital was the most important, followed by structural capital. This difference may be due to the nature of the sample and/or industries included in each study.

The current study results also show that there is a strong and significant relationship between intellectual capital variables and JPM Organizations' business performance, though the lowest relation has been found between structural capital and JPM Organizations' business performance. The previous related studies were having different ideas about the importance of each intellectual capital variable as follows: Bollen et. al. (2005) concluded that structural capital alone was not having a significant relationship with overall scale for German organizations' business performance. Miller et. al. (1999) concluded that there is consensus in respect of the usefulness of the human and relational capital indicators over structural capital indicators. Berglund et. al. (2002) concluded that there is a linear pattern between the intellectual capital in general and the market value, though structural capital has the lowest effect. Bontis (1999) and Bontis (2001) concluded that the intellectual capital is significantly affecting business performance. While Bontis et. al. (2000) concluded that the relationship between relational capital and structural capital leads to a higher business performance. Wang and Chang (2005) concluded that with the exception of human capital, structural capital and relational capital have a direct effect on business performance, while human capital has a direct impact on the other intellectual capital elements,

but in turn it affects business performance. Tsan and Chang (2005) concluded that the interaction between intellectual capital variables and several business performance indicators have high statistical correlation. Kujansivu and Lonnqvist (2005) concluded that investment in intellectual capital leads to a higher productivity, which has positive effect on profitability. Andrikopoulos and Kaimenakis (2006) concluded that there is a correlation between intellectual capital and market value. While Firer & Stainbank (2003) concluded that a positive relationship exists between intellectual capital performance and profitability, but negative with productivity, and inadequate with market valuation. Finally, Huang and Liu (2005) concluded that the investment on structural capital has no significant effect on business performance.

6.4. Relationships and Interactions among Intellectual Capital Sub-variables:

Relationship and Interaction among Human Capital Sub-variables: Pearson correlation matrix table (5.25 P.133) shows that the relationship among human capital sub-variables is strong, where r (0.701 to 0.745). PLS and Path analysis model (5.2 P.171) shows that the correlations and interactions among human capital sub-variables are strong. The relationship between the learning and education sub-variable and the experience and expertise sub-variable is strong in both directions, and the relationship between the learning and education sub-variable and the innovation and creation sub-variable is strong in both directions.

Finally, the relationship between the experience and expertise sub-variable and the innovation and creation sub-variable is also strong in both directions. It seems that all human capital sub-variables are strongly related and interacted with each other at almost the same level.

Relationship and Interaction among Structural Capital Sub-variables: Pearson correlation matrix table (5.25 P.133) shows that the relationships among structural capital sub-variables are varied, where r (from 0.339 to 0.631). PLS and Path analysis model (5.4 P.173) shows that the correlation and interaction among structural capital sub-variables are varied, the relation between the systems and programs sub-variable and the research and development sub-variable is moderate to high, and the relation between the research and development sub-variable and the intellectual property rights sub-variable is also moderate to high. While the relation between the systems and programs sub-variable and the intellectual property rights sub-variable is very week in both directions.

Relationship and Interaction among Relational Capital Sub-variables: Pearson correlation matrix table (5.25 P.133) shows that the relationships among relational capital sub-variables are strong, where r (0.461 to 0.711), though they are varied. PLS and Path analysis model (5.6 P.175) shows that the correlation and interaction among relational capital sub-variables are varied. The relationship between the relations with partners, suppliers and customer's sub-variable and

the knowledge about partners, suppliers and customers' sub-variable is high in both directions. The relationship between the alliances, licensing and agreements sub-variable and the relations with partners, suppliers and customers' sub-variable is moderate to low. Finally, the relationship between the alliances, licensing and agreements sub-variable and the knowledge about partners, suppliers and customers' sub-variable is also moderate to low.

6.5. Relationships and Interactions among Intellectual Capital Variables:

Pearson correlation matrix table (5.25 P.133) shows that the relationships among the intellectual capital variables are strong, where r (0.659 to 0.699). As compared with previous studies shown in table (6.3), the current study result is supported by Bin Ismail (2005), but contradicting with Bontis (1999), which shows very low correlation between structural and relational capital.

Table (6.3) and PLS & Path Analysis model (5.19 P.184) show that when human and structural capital variables regressed against each other, the relationship between them is strong. Model (5.20 P.184) shows that when human and relational capital variables regressed against each other, the relationship between them is strong. Model (5.21 P.185) shows that when structural and relational capital variables regressed against each other, the relationship between them is also strong. The current study results are supported by Bollen et. al. (2005) study, which concluded there are strong relationships among intellectual capital variables, when regressed against each other.

Table (6.3): Correlation (r) Among Variables for Different Studies

Variable	Current Study	Bontis 1999	Bin Ismail 2005
HC-SC	0.659*	0.492*	0.524*
SC-RC	0.699*	**0.197**	0.555*
HC-RC	0.687*	0.499*	0.510*
HC-BP	0647*		0.520*
SC-BP	0.557*	0.508*	0.501*
RC-BP	0.670*	0.639*	0.641*
IC-BP	0.698*	0.544*	

PLS model (5.22 P.185) shows that when two intellectual capital variables regressed against the remaining variable, the results show that the correlation between human and structural capital is strong in both directions, and the relationship between human and relational capital is strong in both directions. Finally, the relationship between structural and relational capital is also strong. This result is supported by Bontis et. al. (2000), Bontis (2001), Bollen et. al. (2005) and Bin Ismail (2005), while Bontis (1999) concluded that there was a negative correlation between relational capital and structural capital.

Different studies concluded different results about the relationship among intellectual capital variables and their relationship with organizations' business performance as follows:

Cuganesan (2005) concluded that there is a complex picture of pluralistic relations among intellectual capital elements, and they often transform each other in a pluralistic and fluid manner. Hermans and Kauranen (2003)

concluded that empirical data explained two thirds of the variations in the interactions within the three categories of intellectual capital. Bontis (2001) study revealed that the relationships between intellectual capital elements were not statistically significant. Bontis (1998) concluded that human capital is practically useless without the supportive structural capital that can utilize the human skills, and the relation between structural capital and relational capital was the lowest.

Westnes and Westnes (2002) concluded that a stronger relationship was found between human capital and structural capital than between human capital and relational capital or relational capital and structural capital. Subramaniam and Youndt (2005) concluded that structural capital and social capital positively influence the innovative capability. Human capital negatively influences innovative capability. However, the interaction of human and social capital positively influenced innovative capability. Finally, Seng et. al. (2004, P.13) concluded that there was a direct relationship between information technology and process & innovation capital.

Chapter Seven

Conclusions, Contributions and Recommendations

7.1. Study Conclusions:

Findings of the study support the theory that intellectual capital has the potential to become the new source of wealth in pharmaceutical organizations, and that intellectual capital has a direct and positive effect on JPM Organizations' Business Performance. These results are promising, because they revealed the possibility of investments in intellectual capital at a given point in time, it might have an influence on JPM organizations' prosperity, in terms of productivity, profitability and market valuation. Evidence from results of the study shows that respondents were quite undecided when expressing their opinions, which might suggest that respondents hold the view that the JPM Organizations have an average amount of intellectual capital.

1. Human Capital: Respondents' perception concerning the implementation of the human capital sub-variables ("learning and education", the "experience and expertise" and the "innovation and creation") were varied. However, the overall result seems to suggest that there is a significant implementation of the human capital. It also seems that the respondents were aware of the role of human capital in JPM Organizations' business performance, and strongly believe that all human capital sub-variables affect JPM Organizations' productivity,

profitability and market valuation. Therefore, it seems that the JPM Organizations are having strong interest towards high level of all human capital sub-variables. Empirical results also indicated that the level of human capital existing in JPM Organizations is at an average level compared with other Pharmaceutical Organizations elsewhere. However, it seems that the JPM Organizations do not invest in developing systems and programs related to human capital. Developing human capital has a strong relationship with leadership style and the overall intellectual capital management of JPM Organizations.

2. **Structural Capital:** Findings of the study suggest that the respondents' perceptions concerning the implementation of the structural capital ("systems and programs", "research and development" and "intellectual property rights") were varied, and the overall result seems to suggest that there is no significant implementation of the structural capital variable. The results indicate that there is a significant implementation of the systems and programs and the research & development, but there is no significant implementation of the intellectual property rights. It seems that the respondents were aware of the role of the systems and programs and the research and development in JPM Organizations' business performance, and strongly believe that these sub-variables affect JPM Organizations' productivity, profitability and market valuation. While it seems that respondents were neither aware of the role of the intellectual property rights sub-variable in JPM Organizations' business performance, nor do they believe that the intellectual property rights sub-variable affect JPM Organizations' productivity, profitability and market valuation.

It appears that the respondents agree on the idea that the JPM Organizations have a lower level of structural capital compared to human capital and relational capital. It also seems that the respondents agree on that the JPM Organizations have low interest level toward all the structural capital sub-variables compared with human and relational capital sub-variables.

In conclusion, one may propose that JPM Organizations are still below the average when compared with the world-class organizations, in terms of the presence of structural capital. The current level and development of structural capital has a relationship with the leadership style and the overall managing and leveraging of intellectual capital in the JPM Organizations.

3. Relational Capital: Results suggest that the respondents' perceptions concerning the implementation of the relational capital sub-variables ("alliances, licensing and agreements", "relations with partners, suppliers and customers" and "knowledge about partners, suppliers and customers") were varied, but the results indicated that there is a significant implementation of the relational capital sub-variables.

It seems that the respondents were aware of the role of relational capital sub-variables in JPM Organizations' business performance, and they strongly believe that the relational capital sub-variables affect JPM Organizations' productivity, profitability, and market valuation. Therefore, it seems that the JPM Organizations have strong interest towards a high level of all relational capital sub-variables.

It appears that the respondents are quite agreed when expressing their opinion on relational capital sub-variables. It seems that the JPM Organizations have an average level of relational capital for the future improvement.

4. Interactions, Correlations and Causal Relationships:

Pearson correlation and PLS show that there is a strong and significant correlation among relational capital, human capital and structural capital and they are strongly related to JPM Organizations' business performance. This means that any activity done to improve the level of any intellectual capital component will have a significant effect on other components of intellectual capital and JPM Organizations' business performance. Hence, the proposed "Intellectual Capital" model is substantiated.

Human capital has a significant relationship with structural capital and relational capital. Human capital also has a positive and direct relationship with JPM Organizations' business performance. This means that employees with a high level of human capital can deliver an excellent service to customers. They consequently will be able to manage and leverage the existing intellectual capital to deliver excellent performance of JPM Organizations.

Structural capital has a significant relationship with human capital and relational capital. The study shows that the structural capital does not have significant implementation, though

it has a significant relationship with JPM Organizations' business performance. Moreover, the research and development sub-variable and the intellectual property rights sub-variable do not have significant implementations, though they have significant relationship with JPM Organizations' business performance.

Relational capital has a significant relationship with human capital and structural capital. Relational capital has a significant relationship with the overall JPM Organizations' business performance. The findings show that the existing relational capital affects JPM Organizations' business performance. When managed efficiently, it will result in a significantly better overall business performance improvement of the JPM Organizations.

It seems that the respondents moderately agree when expressing their opinion regarding JPM Organizations' business performance improvement indicators in terms of industry leadership, future outlook, overall response to competition, success rate in new product launches, overall business performance and success, employee productivity, process (transaction) productivity, sales growth, profit growth, company's market valuation (stock value). This indicates that the JPM Organizations are forward-looking organizations. Finally, JPM Organizations have an average human and relational capital, but low structural capital. Changing the current situation and capitalizing the effort on the three elements together will result in a significant improvement in all aspects of the JPM Organizations' business performance.

The results indicate that managing the three intellectual capital elements together i.e. synchronizing and synergizing them with each other, will lead to leveraging intellectual capital to the maximum level, and consequently producing the maximum performance improvement for the JPM Organizations.

The results have shown that there is a strong need to investigate further the influence of intellectual capital on JPM Organizations' business performance. All business leaders should understand and appreciate the power of intellectual capital management effect on business performance. Implementing the suggested recommendations will further enhance the overall management and performance of JPM Organizations in the future.

7.2. Study Contributions:

This research may be considered as an initiative research that deals with intellectual capital in Jordan, and in Arab countries. The current study may be also regarded as initiative study that used partial least square (PLS) in management field.

To get maximum benefits from the subject, managing intellectual capital can be applied at three levels: First at national level and this is called Social Capital. Second at an organizational level, which is called Intellectual Capital and can be applied for profitable or non-profitable organizations whether private, public or government. Finally at an individual level that is called Brainpower. Therefore, the contributions of the current study might be important for individuals, organizations, government and society in general.

1. Nation's Intellectual Capital (Social capital) is the capacity of the society to create and develop entrepreneurs, inventors, innovators and leaders. Therefore, defining, measuring, managing and developing the social capital at a country level are necessary. According to Bontis (2004) there has never been an intellectual capital development report published for the Arab region nor for any of the Arab countries individually.

Social capital improves the capabilities of individuals and organizations for future benefits. Social capital is about high co-operation among society, government, academic institutions, organizations and individuals (basic research and secondary research).

2. Individual's Intellectual Capital (Brainpower): Brain-energy can be defined as "the capacity to do work." (Ramsay 2006 p.4), while brainpower is "the capacity to solve problems per unit time" (Ramsay 2006 p.5). Brainpower (intelligence) is an individual property (Buchanan and Huczynski 2004 p.151), it includes what is in the mind of an individual: Knowledge, competences, experience, know-how, skills, innovativeness, creativeness, problem-solving abilities and decision-making (Niemann 2006 p.19, Davis 2004 p.18, Hamzah 2006 p.27 and Mavridis 2005b p.43). It is a social construction acquired by storytelling that includes language, knowledge and skills that affect personal rationalism, subjectivism, consistency and stability: Thinking, talking and acting (Reindl 2005 p.3, Nickols 2003 p.3, Gilsing & Nooteboom 2005 p.2, and Buchanan and Huczynski 2004 p.143 & 845).

Consequently, it affects the performance: Behavior and attitudes (Buchanan and Huczynski 2004 p.110, 122 & 161), which in turn affect efficiency and productivity of individuals (Johnson and Scholes p.156-157). In summary, it is the person's ability to act in various situations that define his/her market value (Rose 2005 p.39).

Social construction, deconstruction and reconstruction of reality theory invite for thinking out off the box or out of the current paradigm by brainstorming or any other technique to criticize and develop the current behavior paradigm (Currall 2006 p.8, Newman 2005 p.8 and 11, Durain 2006 p.6 and Buchanan and Huczynski 2004 p.23 & 57). Brainpower programs are about changing the individual paradigm i.e. changing performance: Behavior and attitudes (Harvey and Brown p.14). Thus, increasing the individual's efficiency and productivity to be one of the core capabilities or core competences for organizations and society (Waits 2003 p.13., Cummings & Worley, 2005 p.308-309 and Johnson & Scholes p.156-157). Therefore, defining, measuring, managing and developing the individual's intellectual capital is necessary. This can be done by using the Brainpower test and 360° test (Buchanan and Huczynski 2004 p.126), which will help in selection, evaluation, development and training (Konopaske & Invancevich 2004, p.18). These programs capture the most talented people to appoint them or prepare them to be future leaders.

3. Organization's Intellectual Capital: The fundamental concept behind intellectual capital management at an organizational level is to take a holistic approach to the life cycle management of most critical assets within an organization. Organizational intellectual capital should be defined,

measured, managed and developed to improve and maximize the organizational performance to achieve organization's objectives. Intellectual capital management is a powerful tool for all organizations seeking competitive advantage in today's environment. It plays a role in all of the key initiatives that will define all industries and organizations in the near future. It is an integrated approach to manage intellectual capital across the organization; as a result, it improves the profit margins.

7.3. Study Recommendations:

1. Recommendations for Jordanian Pharmaceutical Manufacturing Organizations:

JPM Organizations have great potentials for future performance improvement. Nowadays, JPM Organizations are not too much behind other world-class pharmaceutical organizations, with the increase level of the presence of organizations' intellectual capital, JPM Organizations can improve and attain better performance. Based on the research findings, effective management will leverage intellectual capital, and then improve business performance. In the light of research results, the following recommendations can be suggested:

1. The research results can help managers establish distinctive strategic positions. Building competitive strategies for managing intellectual capital is important, therefore, organizations should adopt an intellectual capital strategy. The adoption can be divided into four steps: First, identifying and evaluating the present intellectual capital in the organization.

Second, matching the organization's revenues with the intellectual capital assets that produce them. Third, developing a strategy for investing and exploiting the organization's intellectual capital assets. Finally, improving the efficiency and productivity of organization's workforce and processes.

2. The current management system at JPM Organizations ought to be seriously re-evaluated. They must be managed by policies, systems and programs not by individuals.

3. The optimal procedure for JPM Organizations is to focus on all three components of intellectual capital in order to increase JPM Organizations' business performance, since they enhance each other.

4. The elements of intellectual capital need to be integrated with the present recruitment criteria, promotion criteria, reward and recognition criteria, performance management criteria, leadership development programs, and organizational development programs.

5. Defining the role of intellectual capital in business and industry in a formal way. It can be done by designing a map for intellectual capital in the organization. Then, conducting an initial intellectual capital screening to build intellectual capital portfolio, which determines the people and systems where intellectual capital resides.

6. Managers should design systems and set up appropriate programs for monitoring and managing intellectual capital and related databases. Then, they should develop standards for intellectual capital, including measurements, indices, benchmarks, policies and programs.

7. Identifying key people in each organization as intellectual capital champion. Managers at JPM Organizations would be responsible for preparing a plan for managing intellectual capital and linking it to the organization's strategic goals. At the same time, JPM Organizations should consider the establishment of the post of Chief Intellectual Capital Management Officer (CICMO) who is responsible for designing, planning, implementing, monitoring and reviewing the whole intellectual capital management practices in the organization.

8. Creating human intellectual capital programs to identify gaps in training needs. Long-term structured training programs must be developed and should be related to core competencies and expertise and seriously implemented. Training programs need to be designed for the individual employees for further career development.

9. Leadership development programs including change management programs for top management should focus on the issue of intellectual capital enhancement, such as developing and promoting trust with emphasis on cooperation. Also educating the managers and supervisors on the importance of measuring and managing intellectual capital is necessary.

10. Employees' profiles: Making intellectual capital index to evaluate each employee through employees' test profile such as; Brainpower test and 360-degree test, which will provide feedback information about the competencies and capabilities of the staff for the purpose of their further development and training.

11. Exploring the usefulness of structural capital indicators, specifically those related to work systems, programs, processes and procedures. This can be done by utilizing information systems and sharing tools that help in intellectual capital exchange among employees and organizations. Moreover, sending employees to conferences and trade shows to know what is new about intellectual capital.

12. Using benchmarking approach to adopt systems and elements for success stories and implementing elements of the intellectual capital that people have. Also identifying gaps to be filled based on weaknesses relative to competitors, customers, suppliers and best practices.

13. Promoting technology orientation culture by articulating and executing research & development and intellectual property rights (patent) strategies and portfolios, especially by building better trademarks, brand and trade secrets. Moreover, establishing quality management programs and good practices programs.

14. Promoting export orientation and building export-marketing capabilities in order to expand JPM Organizations activities locally, regionally, and internationally.

15. Assessing and articulating strategies to improve government policies and regulations, which affect JPM Organizations.

16. More co-operations among the organizations within the same industry i.e. promoting business partnership culture among the JPM Organizations by establishing purchasing partnership, research and development partnerships, production partnerships, marketing partnerships and technology commercialization partnership.

17. Improving the relationships with universities and other academic institutions to get the benefit from the basic research, public science and management research, technology research, technology transfer and commercialization research.

18. Conducting a conference for JPM Organizations through which information regarding intellectual capital can be shared and conducting further research that develop JPM Organizations position in the world market.

19. Considering global strategic options for alliances, licensing, agreements and joint ventures. Also considering mergers and acquisitions within JPM Organizations, and considering diversification in the production and marketing of pharmaceuticals.

20. Promoting principles in terms of loyalty, trust, relationship and teamwork among the employees, and preparing code of conduct for industry and for each organization.

21. Consistently, conducting intellectual capital screening to re-evaluate the organization's intellectual capital accumulation by using indices and metrics. Each organization should design and develop indicators that are linked to its own strategy and value creation. Also including the organization's intellectual capital portfolio and its development in an annual report.

2. Recommendations for Government and Society:

Social capital platform development is the government and community responsibilities including individuals and organizations. Bontis (2004) was the first who has conducted a study about the presence of social capital among Arab countries (excluding Iraq). Bontis (2004 P.14) stated that the Arab countries have never been examined through the intellectual capital framework lens. Bontis (2004 P.26-29) study concluded that: Jordan was the first among Arab countries in National Human Capital Index rated (0.842), followed by Kuwait that rated (0.726). Jordan was also the first in National Market Capital Index rated (0.655), followed by Oman which rated (0.434). Jordan was ranked the second in National Renewal Capital Index rated (0.539) after Kuwait which rated (0.604). Jordan was the fourth in National Process Capital Index rated (0.178) and very far from Kuwait that rated (0.973). Jordan was number thirteen in Financial Capital. Finally, Jordan was the second in National Intellectual Capital Index in general rated (0.226), after Kuwait which rated (0.310). Bontis (2004) study results support the current study results as follow: Jordan was the first in human capital and marketing capital, but low in process capital (structural capital).

Similarly, JPM Organizations have rated high scores in human capital and relational capital, but low in structural capital. This indicates that Jordanian government must invest on process capital, which in turn supports organizations to build structural capital especially in research and development and intellectual property rights (patents).

3. Recommendations for Academics and Future Research: Intellectual capital should be of interest to both academics and business practitioners, because the development and management of intellectual capital will require more dedication and effort in the future. Therefore, the researcher recommends the following for future research in the effect of intellectual capital on organizations' business performance:

1. This study was directed towards the managers of JPM Organizations, to test the robustness of the findings. Further research including employees and supervisors might be recommended.

2. This study was also directed towards Pharmaceutical industry. Further empirical work is needed to test the degree to which the findings can be generalized to other industries. Therefore, further testing with cross-sectional group from a wide variety of industries will help mitigate the issue of generalizing conclusions on other industries.

3. This study was conducted on Jordanian organizations. Generalizing results of Jordanian setting to other countries is questionable. Further empirical researches involving data collection over diverse countries are needed. Moreover, comparative researches with other organizations (local, regional and international) are necessary in the future.

4. Similar research could be applied to other industries in order to find out whether the relations between intellectual capital and organizations performance are similar to the current research results. This will serve to enrich the data and raise awareness of the importance of intellectual capital.

5. Although most variables used in this research have high measurement reliability and validity, some variables may have room for further instrument refinement.

6. The researcher took the step to divide intellectual capital variables to sub-variables. Such classification may have room for further improvement in future researches.

7. Exploring the usefulness of other possible structural indicators, specifically those related to work processes, systems, programs and procedures.

8. Developing indicators that are linked to organizational strategy and value creation taking into account the indicators identified as the most useful in the current study.

9. More co-ordination and co-operation between academic institutions and organizations especially between the basic and the secondary research are recommended.

10. Finally, there is a need to analyze data of other organizations over a longer time in order to clearly test the assumptions of the intellectual capital method. The significant differences between organizations and/or industries could be explored by further studies. It is also recommended to work out researches that compare results with other developing countries' under similar assessment and measurement.

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Appendices:

Appendix (1): Expert Interviews Committee:

No.	Name	Qualification	Organization	Title
1	Dr. Adnan Badwan	Ph.D. Pharmacy	JPM	Head of JPM
2	Dr. Azam Safarini	Ph.D. Pharmacy	MIDPHARMA	Head of R&D Department
3	Dr. Fares Hanania	B.Sc. Pharmacy	APM	Marketing General Manager
4	Dr. Hanan J. Al-Sbool	B.Sc. Pharmacy	JAPM	Director of JAPM
5	Mr. Ibrahim Al-Zohud	B.Sc.	JO-RINER	Registration Manager
6	Dr. Mazen Al-Hassan	B.Sc. Pharmacy	DAD	Regional Manager
7	Mr. Mohamad Ali Shaheen	MBA	JOSWE	Head of JOSWE
8	Dr. Mohamad S. Suleiman	Ph.D. Pharmacy	INTER	Technical and Plant Director
9	Dr. Talal Obaidat	B.Sc. Pharmacy	HIKMA	Territory Marketing Manager
10	Engg. Aballah Hijjawi	Engineer		Researcher

* Names according to Alphabetic

Appendix (2): Panel of Judges (Referees) Committee:

No.	Name	Qualification	Organization	Title
1	Dr. Abdel-Sattar Hussien	Ph.D. Operation Mgt.	Al-Zaytoonah University	Dr.
2	Dr. Adnan Badwan	Ph.D. Pharmacy	JPM	Head of JPM
3	Dr. Azam Safarini	Ph.D. Pharmacy	MIDPHARMA	R&D Manager
4	Dr. Ezz Al-Din Hatab	Ph.D. MIS	Arab Academic University	Dr.
5	Dr. Fares Hanania	B.Sc. Pharmacy	APM	Marketing Director
6	Dr. Ghassan Otaibi	Ph.D. MIS	Amman - Arab University	Prof
7	Dr. Hamid Al-Shibi	Ph.D. HRM	Arab Academic University	Dr.
8	Mr. Ibrahim Al-Zohud	B.Sc.	JO-RINER	Registration Manager
9	Dr. Mazen Al-Hassan	B. Sc. Pharmacy	DAD	Regional Manager
10	Dr. Mohamad Al-Nua'imi	Ph.D. Statistics	Amman - Arab University	Prof.

11	Dr. Muzhir Al-Ani	Ph.D. MIS	Amman - Arab University	Dr.
12	Dr. Nejem Aboud Nejem	Ph.D.Management	Al-Zaytoonah University	Prof.
13	Dr. Rateb J. Sweis	Ph.D. Operation Mgt.	Amman - Arab University	Dr.
14	Dr. Sabah Hamid	Ph.D. Business	Amman - Arab University	Dr.
15	Dr. Shafiq El-Otoom	Ph.D. Statistics	Amman - Arab University	Prof.
16	Dr. Sua'ad Barnouti	Ph.D. Business	Amman – Arab University	Prof.
17	Dr. Talal Allaf	Ph.D. MIS	Arab Academic University	Dr.
18	Dr. Zaki Al-Saraf	Ph.D. Statistics	Al-Zaytoonah University	Prof.

* Names according to Alphabetic

Appendix (3): Field Research Support Committee:

No.	Company	Name	Title
1	Arab Pharmaceuticals Manufacturing Company Ltd.	Dr. Fares Hanania	Marketing Director
2	Dar Al-Dawa Development and Investment Company	Dr. Mazen Al-Hassan	Regional Marketing Manager
3	Hikma Pharmaceuticals	Dr. Alia Budeir	Head of Administration & Human Resources
4	Jordanian Pharmaceutical Manufacturing Company	Dr. Adnan Badwan Dr. Mohammed Al-Jafari	Head of JPM Business Development Manager
5	Arab Center for Pharmaceuticals and Chemicals	Dr. Hussam Alden Al-Rafai	Technical Manager
6	United Pharmaceuticals	Dr. Tuhfa Nairoukh	Technical Director
7	Amman Pharmaceutical Industries Company	Dr. Mohamad Al-Atrash	Head of API

8	Ram Pharmaceutical Manufacturing Company	Mr. Mahmoud M. Al-Najmi	General Manager Deputy
9	Hayat Pharmaceutical Industries	Dr. Maher M. Kudri	Managing Director
10	Philadelphia Pharmaceutical Industries Company	Dr. Suhail Qubrusi	General Manager
11	Middle East Pharmaceuticals Manufacturing Company	Dr. Azzam Ali Saffarini	R&D Manager
12	Pharma International	Dr. Rami Al-Sabarini	Marketing Director
13	Jordan Sweden Medical & Sterilization Company, ltd	Mr. Mohamad Ali Shaheen	Head of JOSWE
14	Al-Kindi Pharmaceutical Industries Company	Dr. Omer Jawan	Head of KINDI
15	Jordan River Pharmaceutical Industries, L.L.C	Dr. Amer Khlaifat Mr. Ibrahim Al-Zuhud	Technical Manager Registration Manager

Appendix (4): Jordanian Pharmaceutical Manufacturing Organizations (JAPM Members, 2006)

No.	Company Name	Abbreviation	Established Year	Type	No. of Employees
1	Arab Pharmaceuticals Manufacturing Company Ltd.	APM	1962	Public	834
2	Dar Al-Dawa Development and Investment Company	DAD	1975	Public	720
3	Hikma Pharmaceuticals	HIKMA	1977	Public	638
4	Jordanian Pharmaceutical Manufacturing Company	JPM	1978	Public	397
5	Arab Center for Pharmaceuticals and Chemicals	ACPC	1983	Public	260
6	United Pharmaceuticals	UPM	1989	Private	305
7	Amman Pharmaceutical Industries Company	API	1989	Private	161

8	Ram Pharmaceutical Manufacturing Company	RAM	1992	Private	189
9	Hayat Pharmaceutical Industries	HPI	1993	Public	99
10	Philadelphia Pharmaceutical Industries Company	PHILAD	1993	Public	64
11	Middle East Pharmaceuticals Manufacturing Company	MIDPHARMA	1993	Public	172
12	Pharma International	INTER	1994	Private	285
13	Jordan Sweden Medical & Sterilization Company, ltd	JOSWE	1996	Private	99
14	Al-Kindi Pharmaceutical Industries Company	KINDI	1997	Private	31
15	Jordan River Pharmaceutical Industries, L.L.C	Joriver	1999	Private	94
	Total				4348

Source: Hijjawi, Abdalla (2006): The Jordanian Association of Pharmaceutical Manufacturers (JAPM), DATA BANK

Appendix (5): Educational Level in Jordanian Pharmaceutical Organizations:

No.	Organization Name	Ph.D	MA/M.Sc	B.Sc	Diploma	High School	Less	No. of Employees
1	Arab Pharmaceuticals Manufacturing Company Ltd.	-	5	160	96	166	397	834
2	Dar Al-Dawa Development and Investment Company	4	12	155	207	178	164	720
3	Hikma Pharmaceuticals	7	40	268	216	61	46	638
4	Jordanian Pharmaceutical Manufacturing Company	9	9	139	106	102	32	397
5	Arab Center for Pharmaceuticals and Chemicals	-	4	70	63	75	48	260
6	United Pharmaceuticals	3	16	90	125	60	11	305
7	Amman Pharmaceutical Industries Company	-	3	43	59	35	21	161
8	Ram Pharmaceutical Manufacturing Company	2	4	44	59	69	11	189
9	Hayat Pharmaceutical Industries	1	2	36	33	19	8	99
10	Philadelphia Pharmaceutical Industries Company	-	-	20	11	22	11	64
11	Middle East Pharmaceuticals Manufacturing Company	1	3	58	52	33	25	172
12	Pharma International	1	6	99	82	61	36	285
13	Jordan Sweden Medical & Sterilization Company, ltd	-	8	37	13	22	19	99
14	Al-Kindi Pharmaceutical Industries Company	-	2	16	4	4	5	31
15	Jordan River Pharmaceutical Industries, L.L.C	1	3	20	20	26	24	94
	Total	29	117	1255	1146	933	858	4348

No.	Organization Name	Ph.D	MA/M.Sc	B.Sc	Diploma	High	Less	No. of Employ
1	Arab Pharmaceuticals Manufacturing Company Ltd.	-	5	160	96	166	397	834
2	Dar Al-Dawa Development and Investment Company	4	12	155	207	178	164	720
3	Hikma Pharmaceuticals	7	40	268	216	61	46	638
4	Jordanian Pharmaceutical Manufacturing Company	9	9	139	106	102	32	397
5	Arab Center for Pharmaceuticals and Chemicals	-	4	70	63	75	48	260
6	United Pharmaceuticals	3	16	90	125	60	11	305
7	Amman Pharmaceutical Industries Company	-	3	43	59	35	21	161
8	Ram Pharmaceutical Manufacturing Company	2	4	44	59	69	11	189
9	Hayat Pharmaceutical Industries	1	2	36	33	19	8	99

10	Philadelphia Pharmaceutical Industries Company	-	-	20	11	22	11	64
11	Middle East Pharmaceuticals Manufacturing Company	1	3	58	52	33	25	172
12	Pharma International	1	6	99	82	61	36	285
13	Jordan Sweden Medical & Sterilization Company, ltd	-	8	37	13	22	19	99
14	Al-Kindi Pharmaceutical Industries Company	-	2	16	4	4	5	31
15	Jordan River Pharmaceutical Industries, L.L.C	1	3	20	20	26	24	94
	Total	29	117	1255	1146	933	858	4348

Appendix (6): Comparison between Population and Respondents

No.	Organization Name	Male	Female	Total No. of Employees	Male	Female	Total
1	Arab Pharmaceuticals Manufacturing Company Ltd.	442	392	834	4	3	**7**
2	Dar Al-Dawa Development and Investment Company	430	290	720	9	5	**14**
3	Hikma Pharmaceuticals	547	91	638	1	2	**3**
4	Jordanian Pharmaceutical Manufacturing Company	210	187	397	9	2	**11**
5	Arab Center for Pharmaceuticals and Chemicals	169	91	260	2	0	**2**
6	United Pharmaceuticals	133	172	305	10	7	**17**
7	Amman Pharmaceutical Industries Company	79	82	161	9	3	**12**
8	Ram Pharmaceutical Manufacturing Company	105	84	189	2	0	**2**
9	Hayat Pharmaceutical Industries	63	36	99	7	2	**9**
10	Philadelphia Pharmaceutical Industries Company	34	30	64	6	2	**8**
11	Middle East Pharmaceuticals Manufacturing Company	105	67	172	5	6	**11**
12	Pharma International	212	73	285	7	1	**8**
13	Jordan Sweden Medical & Sterilization Company, ltd	64	35	99	6	2	**8**
14	Al-Kindi Pharmaceutical Industries Company	21	10	31	7	3	**10**
15	Jordan River Pharmaceutical Industries, L.L.C	58	36	94	9	1	**10**
	Total	**2672**	**1676**	**4348**	**93**	**39**	**132**
	Percentage	**61.5%**	**38.5%**	**100%**	**70.5%**	**29.5%**	**100%**

Gender:

Appendix (7): Panel of Judges (Referees) Committee Letter (English Version)

INTELLECTUAL CAPITAL QUESTIONNAIRE EVALUATION LETTER

Dear Professor:

Intellectual Capital (IC) identified as “a company’s most valuable asset”. Business managers are continually attempting to find ways to put real dollars on the bottom line as they discover how to measure and manage the Intellectual Capital. The purpose of this study is to advance the understanding of how to achieve the most accurate management related to Intellectual Capital.

You have been chosen and invited to participate as one of the panel judge for Intellectual Capital dissertation’s questionnaire. Your guidance and participation in this research is highly appreciated.

Please find attached a copy of research problem, hypothesis, variables model and questionnaire. Kindly evaluate the questionnaire and I am ready to consider your suggestions and recommendations and re-write the questionnaire.

Please put down your suggestions and recommendations onto the questionnaire, adding any comments you wish about any particular issues that you consider of importance. It is important to state that the design and analysis of this study concentrates on the firm.

Again, thank you for your participation and guidance, and if you have any questions or concerns please do not hesitate to contact (079) 667-5764.

Thank you in advance for your help.

Researcher: Abdel-Aziz Sharabati

Attachments: Copy of research problem, hypothesis, variables model and questionnaire.

Appendix (8): Participants Letter (English Version)

INTELLECTUAL CAPITAL QUESTIONNAIRE

اسْتبْانة حَوْلَ رَأْس المَالِ الفِكْرِيّ

Dear Participant:

Intellectual Capital (IC) identified as “a company’s most valuable asset”. Business managers are continually attempting to find ways to put real dollars on the bottom line as they discover how to measure and manage the Intellectual Capital. The purpose of this study is to advance the understanding of how to achieve the most accurate measurements and management related to Intellectual Capital.

You are invited to participate and complete this Intellectual Capital questionnaire regarding your company. Your participation in this research is highly appreciated. The completion of this questionnaire is very important to the overall design of the study**.**

The questionnaire contains 100 questions that have been designed for your convenience. The questionnaire should take you no more than 30 minutes. Please write down your answers, adding any comments you feel of particular importance to your company or industry. Any answer you give will be confidential, and your company will not be identified to any third. While answering this questionnaire, please make sure that you take on the role as your firm’s representative.

The results will be available to you, if you wish to follow up on this research. Again, thank you for your participation and if you have any questions or concerns please do not hesitate to contact (079) 667-5764**.**

Thank you in advance for your help.

Researcher: Abdel-Aziz Sharabati

Appendix (9): Dissertation Questionnaire (English Version)

INTELLECTUAL CAPITAL QUESTIONNAIRE

A- General Information

Intellectual Capital has often been described as the difference between what a firm's market value is and the cost of replacing its assets. Therefore, this (often-positive) difference can be described as "those things that we normally cannot put a price tag on" such as expertise, knowledge, and a firm's organizational learning ability.

There are three elements encompassing Intellectual Capital: 1) Human capital can be described as the firm's collective capability to extract the best solutions from the knowledge of its individuals, that which is in the minds of individuals; 2) Structural capital can be thought of as the firm's organizational capabilities to meet market requirements, what is left after employees go home for the night; 3) Relational (customer) capital refers to firm's relationships e.g. with the customers, suppliers and partners.

Business performance (productivity, profitability and market valuation). Just to remind you: Productivity means the relation between input and output of processes and transactions. Profitability means earning before interest and tax (EBIT). Market valuation means the value of the whole organization or stock value.

B- Questionnaire Items

The following 90 items tap into Intellectual Capital and its effect on company's business performance. Please, answer these questions based on actual and current situation and not on beliefs.

[1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree] based on how you feel about the statement.

Human Capital

Learning and education:

1	The competence of company's employees as a whole is equal to the most ideal level (matching with their work requirements and responsibilities)	1	2	3	4	5
2	The company gets the most out of its employees when they cooperate with each other in team tasks.	1	2	3	4	5
3	Company's employees undergo continuous training programs every year.	1	2	3	4	5
4	Company's employees continuously learn from others (colleagues and outsiders).	1	2	3	4	5
5	The ratio of educated personnel is in average compared to industry (no. of PhD., Master and Bachelor degree compared with what should be)	1	2	3	4	5
6	Company devotes a lot of time and effort to up-date and develops employees' knowledge and skills.	1	2	3	4	5

7	Company's market share has been continually improving over the past few years.	1	2	3	4	5
8	Employees' learning and education affect company's productivity.	1	2	3	4	5
9	Employees' learning and education affect company's profitability.	1	2	3	4	5
10	Employees' learning and education affect company's market value (stock value).	1	2	3	4	5

Experience and expertise

11	Company's employees are experts in their respective area.	1	2	3	4	5
12	Company's employees consistently perform at their best.	1	2	3	4	5
13	Company's employees generally give it all, which makes this company different from others in the industry.	1	2	3	4	5
14	Company's employees work since many years in the firm (employees turnover is very low)	1	2	3	4	5
15	The company prides itself on being efficient.	1	2	3	4	5
16	The staff is highly professional.	1	2	3	4	5
17	The company has the lowest costs per transaction of any in the industry.	1	2	3	4	5
18	Employees' experience and expertise affect company's productivity.	1	2	3	4	5

19	Employees' experience and expertise affect company's profitability.	1	2	3	4	5
20	Employees' experience and expertise affect company's market value (stock value).	1	2	3	4	5

Innovation and creation

21	Company's employees are considered creative and bright compared to other companies in the industry.	1	2	3	4	5
22	Company's employees are excited to voice their opinions in-group discussions.	1	2	3	4	5
23	Company's employees usually come up with new ideas.	1	2	3	4	5
24	High number of new products is launched compared to competitors.	1	2	3	4	5
25	Company's employees are continuously encouraged to bring new knowledge and ideas to business and share their knowledge with their colleagues.	1	2	3	4	5
26	Company's employees are satisfied with their company's innovation policies and programs.	1	2	3	4	5
27	Company's employees are highly motivated and committed to share new great ideas within company, as it should be.	1	2	3	4	5

28	Employees' innovation and creation affect company's productivity.	1	2	3	4	5
29	Employees' innovation and creation affect company's profitability.	1	2	3	4	5
30	Employees' innovation and creation affect company's market value (stock value).	1	2	3	4	5

Structural Capital:

Systems and programs

31	The company has succession training programs for each and every post/position (major positions)	1	2	3	4	5
32	The company's culture and atmosphere is supportive and comfortable.	1	2	3	4	5
33	The company's recruitment programs are comprehensive; and dedicated to hiring the best candidates available.	1	2	3	4	5
34	The company has a well-developed reward system related to performance.	1	2	3	4	5
35	The company supports their employees by constantly upgrading their skills and education whenever it is necessary.	1	2	3	4	5
36	Staff has sufficient influence over decisions made within the company.	1	2	3	4	5

37	The company is not a “bureaucratic nightmare”.	1	2	3	4	5
38	Company's systems and programs affect company's productivity.	1	2	3	4	5
39	Company's systems and programs affect company's profitability.	1	2	3	4	5
40	Company's systems and programs affect company's market value (stock value).	1	2	3	4	5

Research & Development (R&D)

41	The company is considered as research leader.	1	2	3	4	5
42	The company continuously develops work processes.	1	2	3	4	5
43	The company continuously develops and re-organizes itself based on R&D (e.g. structure and responsibilities).	1	2	3	4	5
44	The company follows up and adopts the latest scientific and technical development around the world.	1	2	3	4	5
45	The systems and procedures of the company support innovation.	1	2	3	4	5
46	The company determines appropriate and adequate budget for R&D.	1	2	3	4	5
47	The company's board of management highly trust and support the R&D department.	1	2	3	4	5

48	Company's R&D affects company's productivity.	1	2	3	4	5
49	Company's R&D affects company's profitability.	1	2	3	4	5
50	Company's R&D affects company's market value (stock value).	1	2	3	4	5

Intellectual Property Rights (IPRs)

51	The company sets clear strategies and procedures for IPRs management	1	2	3	4	5
52	The company monitors performance of the IPRs portfolio.	1	2	3	4	5
53	The company pursues a multiple strategy of licensing IPRs, spinning out new organizations or disposing of to other parties.	1	2	3	4	5
54	The company actively encourages and rewards creation and extended use in order to maximize the income from IPRs.	1	2	3	4	5
55	IP is a key intellectual asset for top management, which is considered for value creation.	1	2	3	4	5
56	The company utilizes the IPRs to maximum level.	1	2	3	4	5
57	The company has high number of IPRs per year compared to competitors.	1	2	3	4	5
58	Company's IPRs affect company's productivity.	1	2	3	4	5
59	Company's IPRs affect company's profitability.	1	2	3	4	5
60	Company's IPRs affect company's market value (stock value).	1	2	3	4	5

Relational (Customer) Capital

Strategic alliances, licensing and agreements

61	The company is currently working on joint projects with many other organizations.	1	2	3	4	5
62	The company has diverse distribution channels.	1	2	3	4	5
63	High ratio of company's business is done with strategic alliances.	1	2	3	4	5
64	The company has many and diverse alliances (R&D, manufacturing, marketing, distribution)	1	2	3	4	5
65	People from outside the company are consulted when decisions are made within the company.	1	2	3	4	5
66	The company is able to learn and add value through its partners.	1	2	3	4	5
67	The company prides itself on being partnership-oriented.	1	2	3	4	5
68	Company's strategic alliances affect company's productivity.	1	2	3	4	5
69	Company's strategic alliances affect company's profitability.	1	2	3	4	5
70	Company's strategic alliances affect company's market value (stock value).	1	2	3	4	5

Customer and Supplier relations

71	A poll of company's customers is loyal to the company, and would indicate that they are generally satisfied.	1	2	3	4	5
72	When it comes to new business, the company's customers have increasingly selected company's products versus competitor's customers over the past few years.	1	2	3	4	5
73	The company capitalizes on customers' wants and needs by continually striving to make them satisfied.	1	2	3	4	5
74	The company devotes considerable time to select suppliers.	1	2	3	4	5
75	The company maintains long-standing relationship with suppliers.	1	2	3	4	5
76	The company has greatly reduced the time it takes to resolve a customer's problem.	1	2	3	4	5
77	The company feels confident that their customer will continue to do business with it.	1	2	3	4	5
78	Company's relationship with customer and supplier affect company's productivity.	1	2	3	4	5
79	Company's relationship with customer and supplier affects company's profitability.	1	2	3	4	5
80	Company's relationship with customer and supplier affect company's market value (stock value).	1	2	3	4	5

Customer Knowledge

81	It is important for the company to share knowledge with its partners.	1	2	3	4	5
82	The company gets as much feedback out of customers as possibly can under different circumstances.	1	2	3	4	5
83	Customer knowledge is widely distributed throughout the company.	1	2	3	4	5
84	Data about customer is continuously updated.	1	2	3	4	5
85	The company has relatively complete data about the suppliers.	1	2	3	4	5
86	The company continually meets with customers to find out what they want from it.	1	2	3	4	5
87	The company has a useful and updated information system in use.	1	2	3	4	5
88	Company's knowledge about customers and suppliers affect company's productivity.	1	2	3	4	5
89	Company's data about customers and suppliers affect company's profitability.	1	2	3	4	5
90	Company's knowledge about customers and suppliers affect company's market value (stock value).	1	2	3	4	5

C- Questionnaire Items

The following 10 items are about the company's performance related to key competitors in the industry over the last few years and will be used for administrative and comparative purposes only. If you are not absolutely sure about an item, please just approximate.

[1 = bottom, 5 = top] based on the number that best corresponds to your answer**.**

How do you rank your company compared to the competitors:

91	Industry Leadership.	1	2	3	4	5
92	Future Outlook.	1	2	3	4	5
93	Overall response to competition.	1	2	3	4	5
94	Success rate in new product launches.	1	2	3	4	5
95	Overall business performance and success.	1	2	3	4	5
96	Employee productivity.	1	2	3	4	5
97	Process (transaction) productivity.	1	2	3	4	5
98	Sales Growth.	1	2	3	4	5
99	Profit Growth.	1	2	3	4	5
100	Company's market valuation (stock value).	1	2	3	4	5

D- Please complete this section of the survey:

Total No. of Employees:	
Total 2005 Revenue:	
Total 2006 Revenue:	
Your Position (Title):	
Company Name:	
Company Address:	
Telephone:	
Fax:	
E-mail:	
Web-site URL:	

E- Please note that the researcher left this space for any comments the respondent wishes to state.

Thank you for completing the questionnaire.

Appendix (10): Panel of Judges (Referees) Committee Letter (Arabic Version)

Intellectual Capital (IC) Questionnaire Evaluation Letter

حضرة الأستاذ الفاضل:

يعتبر رأس المال الفكري (IC) أكثر أصول المنظمةِ قيمة وثمناً. حيث أن المديرون في الشركات والمؤسسات وبشكل مستمر يُحاولونَ إيجاد أفضل الطرقِ للاستثمارات ساعين في الوقت نفسه أن تكون النفقات في الحد الأدنى خاصة بعد أن إكتشفوا كَيفيةَ قياس وادارة الأصول غير الملموسة، مثل رأس المال الفكري. إنّ غرضَ هذه الدراسةِ هو تقصي أثر رأس المال الفكري على أداء شركات صناعة الأدوية الأردنية.

لقد تم اختياركم لكي تكونوا من المحكمين لإستبيان أطروحة الدكتوراة حول أثر رأس المال الفكري على أداء شركات صناعة الأدوية الأردنية. اننا نثمن ونقدر اشتراككم وتوجيهآتكَم لصالح هذه الدراسةِ.

ارجوا من سيادتكم التكرم بالإطلاع على المرفقات التالية: مشكلة وفرضيات الدراسة، نموذج الدراسة والإستبيان. كما ارجوا من حضرتكم التكرم بتُقيّمُ الإستبيان وتدوين اقتراحاتكم وتوصياتَكم بشأنه، وإضافة أي تعليقات حول القضايا التي تَعتبرونها مهمة لهذه الإطروحة و للصناعة الدوائية وأَنا على أتم الاستعدادُ للأخذ باقتراحاتكم وتوصياتِكَم عند إعادة كْتابة وتعديل الإستبيان.

نَتائِجِ الدراسة سَتَكُونُ متوفرةَ لكم حال طلبكم إياها، إذا أردتم مُتَابَعَة هذا البحثِ. اكرر شكري لإشتراككم ولتوجيهِاتكَم، وإذا كان لديكم أي إستفسار أو ملاحظة، الرجاء الاتصال على الرقم (0796675764).

شكراً لكم مُقدماً على إهتمامكم ورعايتكم.

الباحث: عبد العزيز الشرباتي

المرفقات: مشكلة وفرضيات الدراسة، نموذج الدراسةِ والإستبيان

Appendix (11): Participants Letter (Arabic Arabic)

Intellectual Capital Questionnaire

اسْتبْانة حَوْلَ رَأْس المَالِ الفِكْرِيّ

المُشَارِك العَزِيز:

يُعْتَبَرُ رَأْسُ المَالِ الفِكْرِيّ أكثرَ أُصُولِ الشَّرِكَةِ قِيمَةً وَثَمَناً. حَيْثُ إنَّ المُدِيرينَ في الشَّرِكَاتِ وَالمُؤَسَّسَاتِ يُحاولونَ بِشَكْلٍ مُسْتَمِرٍّ إيجادَ أفضل الطرقِ للاستثمارات ساعين في الوقت نفسِه أنْ تكون النفقاتُ في الحد الأدنى، خاصة بعد أنِ اكتَشَفُوا كَيفيةَ قياس وإدَارَة الأصول غيرِ الملموسة، مثل رَأْس المَالِ الفِكْرِيّ. وَغَرَضُ هذه الدراسةِ هو تَقَصِّي أَثَرَ رَأْس المَالِ الفِكْرِيّ عَلَى أَداءِ شَرِكَاتِ صِنَاعَةِ الأَدْوِيَةِ الأُرْدُنِيِّةِ.

أنْتَ مَدْعُوٌّ للمُشَارَكَة وَإكْمالِ اسْتِبْانة رَأْسِ المَالِ الفِكْرِيّ لشَرِكَتِكَ والتي تَحتوي على 100 فقرة، ونَتَوَقَّعُ أَنْ تَسْتَغْرِقَ تَعبئتُها حَوَالي 30 دقيقة. وَإذْ نُثَمِّنُ وَنُقَدِّرُ اشْتِرَاكَكَ مَعَنَا فِي هذِهِ ألدِّرَاسَةِ، لنا رَجاءٌ أَنْ تَقْرَأ أجاباتك على الاسْتِبْانة ثمَّ تُضيف أيَّ تعليقات حول القضايا أَو الملاحظاتِ التي تَشْعرُ أنها هَامَّةٌ لهَذا البَحْث أو لشركتك أَو للصناعة الدوائية. عِلْمًا أَنَّ الإجاباتِ سرّيةٌ وسوف تُسْتَخْدَمُ لأغْرَاضِ البَحْث فقط.

وَالرَّجَاءُ أَنْ تتذكر وأنْتَ تُجيبُ على هذه ألاسْتِبْانة أنّك تُمَثِّلُ شَرِكَتَكَ، ومن المُهِمِ ملاحظة أنَّ تصميم هذه الدراسةِ يركّزُ على مستوى الشَّرِكَة، وَألإجابَةُ عليها مُهِمٌّ جداً للتصميمِ العامِّ للدراسةِ.

وَنَقترحُ أنْ تقوم بِمُرَاجَعَة ألاسْتِبْانة أولاً للإطلاع على التعريفات والمصطلحات التي لها علاقة برَأْس المَالِ الفِكْرِيّ أَو بالصناعة الدوائية، هذه المراجعة سَتُمكّنُك من بلورة المعلوماتِ قَبْلَ ألإجابة على الأسئلةِ.

الرَّجَاءُ التأكّد من إكْمال الإجابات على جميع الفقرات في هذة ألاسْتِبْانة. وَإذا رَغِبْتُم في مُتَابَعَة هذا البحثِ فَسَتَكُونُ نتائج الدِّرَاسَةِ متوفرةً لَكُمْ إنْ طَلَبْتُم.

أُكَرِّرُ شُكْرِي لاشتراككم ولتوجيهاتكَم، وإذا كان لديكم أي استفسار أو ملاحظة، الرجاء الاتصال على الرقم (0796675764).

وَشُكْراً لَكُمْ عَلَى اهْتِمَامِكُمْ وِرِعَايَتِكُمْ.

الباحث: عبد العزيز ألشرباتي

Appendix (12): Dissertation Questionnaire (Arabic Version)

INTELLECTUAL CAPITAL QUESTIONNAIRE

اسْتبْانة حَوْلَ رَأْس المَالِ الفِكْرِيّ

1) معلومات عامة:

يُوْصفُ رَأْس المَالِ الفِكْرِيّ عادة بالفرق بين القيمة السوقية لِلشَّرِكَةِ وكلفةُ استبدال أصولِها. لذا يُوصَفُ هذا الفرق بأنَّهُ: "تلك الأشياءِ التي لا نَستطيعُ وَضْع قسيمة سعر عليها أو لها" مثل الخبرةِ وَالمعرفة وقدرة الشَّرِكَة علي التَعَلّم.

تُشِيرُ كثيرٌ من الدِّرَاسَاتِ إلى أَنَّ رَأْس المَالِ الفِكْرِيّ يتكون من ثلاثة عناصر: 1) رَأْسُ ألمَال ألبشري الذي يُمْكِنُ أَنْ يُوْصَفَ بِالقدرة الجَماعيةَ لِلشَّرِكَةِ لانتزاع أفضل الحلولِ مِنْ معرفةِ أفرادِها. 2) رَأْسُ ألمَال ألهيكلي يُمْكِنُ أَنْ يمثل قدرات الشَّرِكَة لتَلْبِية متطلباتِ السوقِ. 3) رَأْسُ ألمَال ألعلاقاتي (ألزبائني) يُشيرُ إلى علاقاتِ الشَّرِكَة مع الآخرين، مثل العلاقات مَع الزَّبَائِنِ والمُزَوِّدِينَ والشُّرَكَاءِ أو الحُلَفَاءِ.

أداء العملِ يتكون من: الإنتاجية والربحية والقيمة السوقية. فقط للتَذكير: الإنتاجية تعْني العلاقةَ بين المدخلات والمخرجات من العملياتِ والحركات. الربحيةُ تعْني الربح قبل الفائدة والضريبةِ (IBIT). القيمة السوقية (التقدير في البورصةُ) تعْني قيمةَ الشَّرِكَة الكاملةِ أَو قيمةِ ألاسهمِ.

2) متغيرات رَأْس المَالِ الفِكْرِيّ وعلاقتها بالأداء: (الفقرات من 1 إلى 90).

(الرجاء التأكّدْ من إجابة كُلّ سؤال ووضع دائرة حول الجواب الصحيحَ استِنادًا إلى مشاعرك وأحاسيسك حول الواقع الموجود وليس بناء على الاعتقاد أو الوضع المثالي لكل فقرة كالتالي: [1 = لا أوافقُ بقوة.....، 5 = أوافقُ بقوة])

رَأْسُ ألمَال ألبشري

التعليم والتَعَلّم

1	انَّ جَدَارَةَ ومؤهلات المُوَظَّفِينَ فِي الشَّرِكَة تصل إلى المستوى الذي تتطلبه مهماتهم.	1 2 3 4 5
2	إن الشَّرِكَة تحصل على أفضل المخرجات من مُوَظَّفيها عندما يَتعاونونَ مَعًا كفريقِ عمل.	1 2 3 4 5
3	تنفذ الشركة برامج تدريبية مُسْتَمِرَّة لجميع المُوَظَّفِينَ فِيها كل عام.	1 2 3 4 5

4	انَّ المُوَظَّفِينَ يَتعلّمُون من بعضهم ومِنْ الآخرين باستمرار.	5 4 3 2 1
5	إن نسبةَ المُوَظَّفِينَ المتعلّمينِ فِي الشَّرِكَة تتناسب والمعدل بالمقارنة مع الشَّرِكَاتِ الأخرى في الصناعةِ نَفْسِهَا (الدكتوراه والماجستير والبكالوريوس).	5 4 3 2 1
6	إن الشَّرِكَة تكرس كثيرا مِنْ الوقتِ والجُهدِ من أجل تطوير وتحديث معرفة ومهارة المُوَظَّفِينَ.	5 4 3 2 1
7	إن الحصة السوقيه لِلشَّرِكَةِ تَتحسّنُ بشكل مستمر خلال السَنَوات القليلة الماضية.	5 4 3 2 1
8	انَّ تعليمِ وتَعَلّم المُوَظَّفِينَ يُؤَثِّرَانِ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
9	إن تعليمِ وتَعَلّم المُوَظَّفِينَ يُؤَثِّرَانِ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
10	إن تعليمِ وتَعَلّم المُوَظَّفِينَ يُؤَثِّرَانِ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

التجربة والخبرة:

11	إن المُوَظَّفِينَ يمتلكون خبرة عالية في مجال أعمالهم المطلوبة والمخصصة لهم.	5 4 3 2 1
12	إن المُوَظَّفِينَ يؤدون أعمالهم المطلوبة بأفضل ما يكون وبشكل ثابت.	5 4 3 2 1
13	إن المُوَظَّفِينَ بشكل عام يقدمون لِلشَّرِكَةِ أفضل ما لديهم لجعلها مختلفة ومميزة عن المنافسين في الصناعةِ.	5 4 3 2 1
14	إن المُوَظَّفِينَ يَعْملون منذ العديد مِنْ ألسَنَواتِ فِي الشَّرِكَة (دوران عمالة قليل).	5 4 3 2 1
15	إن الشَّرِكَة تَفْتخرُ بكفاءتها.	5 4 3 2 1
16	إن المُوَظَّفِينَ محترفونُ بشكل كبير.	5 4 3 2 1
17	إن الشَّرِكَة لَديها أرخص تكلفة لكلّ حركة مقارنة مع الشَّرِكَاتِ الأخرى في نفس الصناعةِ.	5 4 3 2 1
18	إن تجربة وخبرةِ المُوَظَّفِينَ يُؤَثِّرَانِ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
19	إن تجربة وخبرةِ المُوَظَّفِينَ يُؤَثِّرَانِ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
20	إن تجربة وخبرةِ المُوَظَّفِينَ يُؤَثِّرَانِ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

إبداع المُوَظَّفِينَ وتوليد الأفكار:

21	إن المُوَظَّفِينَ يُعْتَبَرُونُ مُبْدِعين ولامعين مقارنة مع الشركات الأخرى في نفس الصناعة.	5 4 3 2 1
22	إن المُوَظَّفِينَ يتحمسون لطرح وإبْداء آرائهم في المُناقشاتِ الجماعيةِ والاجتماعات.	5 4 3 2 1
23	إن المُوَظَّفِينَ عادة يبتكرون أفكارا جديدةَ.	5 4 3 2 1
24	إن عدد المنتجات الجديدةِ والمطورة التي تقدم إلى السوق أكثر من التي يقدمها المنافسون.	5 4 3 2 1
25	إن الشَّرِكَة تستمر بتشجيع المُوَظَّفِينَ على اكتساب المعرفةِ والأفكارِ الجديدة ومَشَاركة الزملاءِ فيها لاستخدامها بالعمل.	5 4 3 2 1
26	إن المُوَظَّفِينَ راضون عن سياسة وبرامج الإبداع وتوليد الأفكار في الشَّرِكَة.	5 4 3 2 1
27	إن المُوَظَّفِينَ متُحفّزونَ وملتزمون بالمشاركة بالأفكار الجديدة داخل الشركة كما ينبغي.	5 4 3 2 1
28	انَّ إبداع المُوَظَّفِينَ وتوليد الأفكار يُؤَثِّرَانِ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
29	إن إبداع المُوَظَّفِينَ وتوليد الأفكار يُؤَثِّرَانِ على ربحيةِ الشَّرِكَة	5 4 3 2 1
30	إن إبداع المُوَظَّفِينَ وتوليد الأفكار يُؤَثِّرَانِ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهمِ).	5 4 3 2 1

رَأْسُ ألمَال ألهيكلي

الأنظمة والبرامج:

31	إن لدى الشَّرِكَة برامج تدريب لتهيئة البديل المناسب لكُلّ موقع (المواقع المهمة)	5 4 3 2 1
32	إن ثقافة وظروف عمل الشَّرِكَة مساعدة ومريحة.	5 4 3 2 1
33	إن برامج التوظيف شاملة؛ بحيث تكرّسُ الشَّرِكَة الجهد العالي لتوظيف أفضل المرشّحين المتوفرين.	5 4 3 2 1
34	إن لدى الشَّرِكَة نظامَ حوافز وجوائز متطورًا جداِ ويركز على الأداءِ.	5 4 3 2 1

35	إن الشَّرِكَة تَدعمُ المُوَظَّفِينَ بشكل ثابت ودائم لتَوسيع وتطوير مهاراتِهم وتعليمِهم عند ألضرورة.	5 4 3 2 1
36	إن المُوَظَّفِينَ لَهم تأثيرٌ كافٍ على القراراتِ التي تقرر ضمن الشَّرِكَة.	5 4 3 2 1
37	إن هذه الشَّرِكَة لَيستْ "كابوسا بيروقراطيا".	5 4 3 2 1
38	إن أنظمة وبرامجِ الشَّرِكَة تُؤَثِّرُ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
39	إن أنظمة وبرامجِ الشَّرِكَة تُؤَثِّرُ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
40	أنَّ أنظمة وبرامجِ الشَّرِكَة تُؤَثِّرُ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

البَحْث والتطوير العلمي:

41	إن الشَّرِكَة رائدة في البَحْث العلمي.	5 4 3 2 1
42	إن الشَّرِكَة تُطوّرُ العمليات بشكل مستمر.	5 4 3 2 1
43	إن الشَّرِكَة تتطوّرُ وتعيد تنظيم نفسها بشكل مستمربما يتناسب مع البحث والتطوير العلمي (مثل: تطوير الهيكل وألمسؤوليات).	5 4 3 2 1
44	إن الشركة تتابع وتتبنى أخر التطورات العلمية والتقنية حول العالم.	5 4 3 2 1
45	إن ألانظمة والإجراءات في الشَّرِكَة تَدْعمُ الإبداع.	5 4 3 2 1
46	إن الشركة تخصص وترصد ميزانية كافية ومناسبة للبحث العلمي.	5 4 3 2 1
47	إن قيادةَ الشَّرِكَة (مجلس الإدارة) يثقون ويَدعمون البحث والتطوير العلمي إلى حدٍ كبير.	5 4 3 2 1
48	إن البَحْث والتطوير العلمي يُؤَثِّران على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
49	إن البَحْث والتطوير العلمي يُؤَثِّران على ربحيةِ الشَّرِكَة.	5 4 3 2 1
50	إن البَحْث والتطوير العلمي يُؤَثِّران على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ:

51	إن الشَّرِكَة تضعُ استراتيجيات وإجراءات واضحة لإدارةِ حُقُوقِ المُلْكِيَّة.	5 4 3 2 1
52	إن الشَّرِكَة تراقب عن كثب أداء حقيبةِ (ملفات) حُقُوقِ المُلْكِيَّة.	5 4 3 2 1
53	إن الشَّرِكَة تتبع إستراتيجيات متعدّدة مِنْ اجل منح أو الحصول على تراخيص حُقُوقِ المُلْكِيَّة (سواء أخذا أم عطاء من أو إلى أطرافِ أخرى).	5 4 3 2 1
54	إن الشَّرِكَة تشجّعُ بنشاط وتكافئ توليد الأفكار وتوسيع استعمالها لكي تعظم الدخلَ من حُقُوقِ المُلْكِيَّة.	5 4 3 2 1
55	إن الشَّرِكَة تعتبر حُقُوقِ المُلْكِيَّة هي ألثروة الرئيسية لرَأس المَالِ الفِكْرِيّ وتعمل الإدارة على تعظيم قيمتها ضمن توجيهات الشركة بشكل عامٍّ.	5 4 3 2 1
56	إن الشركة تستخدم وتستفيد من حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ إلى أقصى حد ممكن.	5 4 3 2 1
57	إن الشركة تطور وتسجل عددا كبيرا من حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ كل سنة مقارنة بالمنافسين.	5 4 3 2 1
58	إن حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ تُؤَثِّرُ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
59	إن حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ تُؤَثِّرُ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
60	إن حُقُوقَ المُلْكِيَّةِ الفِكْرِيَّةِ تُؤَثِّرُ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

رَأْسُ ألمَال ألعلاقاتي (ألزبائني)

التحالفات الإستراتيجية والتراخيص والإتفاقيات:

61	إن الشَّرِكَة تَعْملُ حالياً على المشاريع المشتركةِ مع العديد مِنْ المُؤَسَّسَات.	5 4 3 2 1
62	إن لدى الشَّرِكَة قنوات توزيعِ متنوّعةِ.	5 4 3 2 1
63	إن نسبةً عاليةً مِنْ أعمالِ الشَّرِكَة تعمل بالتحالفاتِ الإستراتيجيةِ مع المؤسسات الأخرى.	5 4 3 2 1

64	لدى الشَّرِكَة الكثيرُ من التحالفاتِ المتنوّعةِ (في البَحْث والتطوير العلمي، التصنيع، التسويق والتوزيع).	5 4 3 12
65	انه يتم استشارة خبراء وأشخاص من خارج الشَّرِكَة عند إتخاد القراراتَ الاستراتيجية لتُصبحُ قيد التنفيذ.	5 4 3 2 1
66	إن الشَّرِكَة قادرة على التَعَلّم وإضافة قيمةٍ لها من خلال التحالفات.	5 4 3 2 1
67	إن الشَّرِكَة تَفْخرُ بنفسها على أنهاْ تتبنى سياسة التحالفات.	5 4 3 2 1
68	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤَثِّرُ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
69	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤَثِّرُ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
70	إن التحالفات الإستراتيجية والتراخيص والاتفاقيات تُؤَثِّرُ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

العلاقات مع المُزَوِّدِينَ والزبائنَ:

71	إن معظم الزَّبَائِنِ موالون لِلشَّرِكَةِ وراضون عنها بصفة عامة.	5 4 3 2 1
72	إن الزبائن يختارون المنتجات الجديدة لِلشَّرِكَةِ بشكل متزايد مقارنة مع زبائن المنافسين خلال السَنَوات القليلة الماضية.	5 4 3 2 1
73	إن الشَّرِكَة تركز على وتستفيدُ مِنْ رغبات وحاجاتِ زبائنِها عن طريق بذل جهود مُسْتَمِرَّة لإرضائهم.	5 4 3 2 1
74	إن الشَّرِكَة تكرّسُ وقتا كبيرا لاختيار المُزَوِّدِينَ.	5 4 3 2 1
75	إن الشَّرِكَة تحافظ على علاقاتِ طويلة المدى مَع المُزَوِّدِينَ.	5 4 3 2 1
76	إن الشَّرِكَة قد خفضت إلى حد كبير الوقت اللازم لحل مشاكل الزَّبَائِنِ.	5 4 3 2 1
77	إن المُوَظَّفِينَ يشْعرونُ بالثقة بأنّ الزبائن سيواصلون التعامل مع الشَّرِكَة.	5 4 3 2 1
78	إن العلاقات مع المُزَوِّدِينَ والزبائنَ تُؤَثِّرُ على معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
79	إن العلاقات مع المُزَوِّدِينَ والزبائنَ تُؤَثِّرُ على ربحيةِ الشَّرِكَة.	5 4 3 2 1
80	إن العلاقات مع المُزَوِّدِينَ والزبائنَ تُؤَثِّرُ على القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

المعرفة والمعلومات عن الزَّبَائِنِ والمُزَوِّدِينَ:

81	إن الشَّرِكَة تهتم بمشَاركة حلفائها بالمعرفة والمعلومات.	5 4 3 2 1
82	إن الشَّرِكَة تسعى للحصول على أكبر قدر ممكن من التعليقات والتغذية الراجعة من الزَّبَائِنِ والحُلَفَاءِ وفي كل الظروف.	5 4 3 2 1
83	إن الشَّرِكَة تُعممُ المعرفة والمعلومات حول الزبائن على نحو واسع.	5 4 3 2 1
84	إن البيانات حول الزَّبَائِنِ تُجدّدُ بشكل مستمر.	5 4 3 2 1
85	إن لدى الشَّرِكَة بيانات كاملةٌ نسبياً حول المُزَوِّدِينَ.	5 4 3 2 1
86	إن المُوَظَّفِينَ يَجتمعونُ بالزَّبَائِنِ بشكل مستمر لإكتشاف الرغبات والحاجيات التي يريدونها.	5 4 3 2 1
87	إن نظامَ ألمعلوماتِ المستخدم مفيد ومُحدث.	5 4 3 2 1
88	إن المعرفة والمعلومات عن الزَّبَائِنِ والمُزَوِّدِينَ تُؤَثِّرُعلى معدلِ إنتاجية الشَّرِكَة.	5 4 3 2 1
89	إن المعرفة والمعلومات عن الزَّبَائِنِ والمُزَوِّدِينَ تُؤَثِّرُعلى ربحيةِ الشَّرِكَة.	5 4 3 2 1
90	إن المعرفة والمعلومات عن الزَّبَائِنِ والمُزَوِّدِينَ تُؤَثِّرُعلى القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهم).	5 4 3 2 1

3) متغيرات ألأداء في ضوء أداء المنافسين في الصناعةِ خلال السَنَوات القليلة الماضيةِ: (الفقرات من 91 إلى 100). الرجاء إكمالُ هذا القسمِ من المسحِ الذي سَيستخدم للأغراضِ الإداريةِ والمقارنات فقط. وَإذا لم تكن متأكّدا من الإجابة الرجاء وضع تقدير تقريبي.

كيف تقيم شركتك مقارنة بالشَّرِكَاتِ ألمنافسه بالنسبة للفقرات التالية:

91	القيادة في الصناعةِ.	5 4 3 2 1
92	التطلعات المستقبلية.	5 4 3 2 1
93	ألرَدّ بشكل عامّ على المنافسةِ.	5 4 3 2 1
94	نسبة النجاحِ في تسويق المنتجات الجديدة.	5 4 3 2 1
95	أداء ونجاح أعمالِ الشَّرِكَة بشكل عامٍّ.	5 4 3 2 1

96	معدل إنتاج الموظفِ.	5 4 3 2 1
97	معدل إنتاجية العملية (الحركة).	5 4 3 2 1
98	نمو الأرباح.	5 4 3 2 1
99	نمو المبيعاتِ.	5 4 3 2 1
100	القيمة السوقية لِلشَّرِكَةِ (قيمة ألاسهمِ).	5 4 3 2 1

4) الرجاء إكمالْ هذا القسمِ الذي سوف يستخدم لأغراضِ التحليل الإداري فقط.

مجموع المُوَظَّفِينَ:
اجمالْي دخل الشَّرِكَة 2005:
اجمالْي دخل الشَّرِكَة 2006:
الموقع أو المسمى الوظيفي:
اسم الشَّرِكَة أو المؤسسة:
عنوان الشَّرِكَة أو المؤسسة:
الهاتف:
الفاكس:
البريد الإلكتروني:
موقع الويب (Web-site):

5) الرجاء كتابة التعليقاتَ والملاحظات حول مشروعِ البَحْث وآلاسْتِبْانة بشكل عام والأسئلة والفقرات بشكل خاص ولك جزيل الشكر. (يمكن أن تستخدم أوراق إضافية للملاحظات والتعليقات)

شكراً لإكْمال ألاسْتِبْانة.

ألشرباتي. عبدالعزيزأحمد

Appendix (13): Correspondence with Dr. Nick Bontis.

From: Nick Bontis

Date: 7/24/2006 5:58:38 PM

To: 'Abdel Aziz'

Subject: RE: IC Dissertation

You will find a survey sample at the bottom of this link:

www.NickBontis.com/Research.htm

From: nick@bontis.com

Date: 8/15/2006 2:34:16 PM

To: Azizsharabati@cyberia.jo

Subject: Thank You for visiting Dr. Nick Bontis

Hi Abdel-aziz Sharabati,

Thank you for joining the hottest new site on the internet. We will be sure to keep you informed of new application releases, news and event.

Your new access password is “???”.

Thank you for your interest in Dr. Nick Bontis!

Cheers, Dr. Nick Bontis

http://www.nickbontis.com

From: Bontis, Nick

Date: 11/30/2007 8:57:53 AM

To: azizsharabati@cyberia.jo

Subject: Re: RE: IC Dissertation

If you are interested, send me a copy of your dissertation when finished.

I will review it and format it for publication in an academic journal. I would like to be a co-author if you permit me.

Let me know if you want to pursue this.

Cheers, Dr. B

Appendix (14): Intellectual Capital Valuation Methods: Methods for Measuring Intangible Assets.

Year	Title	Author	Category	Description of Measure
1950's	Tobin's q	Tobin J.	MCM	The "q" is the ratio of the stock market value of the firm divided by the replacement cost of its assets. Changes in "q" provide a proxy for measuring effective performance or not of a firm's intellectual capital. Developed by the Nobel Laureate economist James Tobin in the 1950's.
1970's	Human Resource Costing & Accounting (HRCA)	Flamholtz (1985)	DIC	The pioneering work on HR accounting. A number of methods for calculating the value of human resources.

1988	Human Resource Costing & Accounting (HRCA)	Johansson (1996)	DIC	Calculates the hidden impact of HR related costs, which reduce a firm's profits. Adjustments are made to the P&L. Intellectual capital is measured by calculation of the contribution of human assets held by the company divided by capitalized salary expenditures.
1989	The Invisible Balance Sheet	Sveiby (1989)	MCM	The difference between the stock market value of a firm and its net book value is explained by three interrelated "families" of capital; Human Capital, Organizational Capital and Customer Capital. The three categories first published in this book have become a de facto standard.
1990	HR statement	Ahonen (1998)	DIC	A management application of HRCA widespread in Finland. The HR profit and loss account divides personnel related costs into three classes for the human resource costs: renewal costs, development costs, and exhaustion costs. 150 listed Finnish companies prepared an HR statement in 1999.

1992	Balanced Score Card	Kaplan and Norton (1992)	SC	A company's performance is measured by indicators covering four major focus perspectives: (1) financial perspective; (2) customer perspective; (3) internal process perspective; and (4) learning perspective. The indicators are based on the strategic objectives of the firm.
1994	Intangible Asset Monitor	Sveiby (1997)	SC	Management selects indicators, based on the strategic objectives of the firm, to measure four aspects of creating value from 3 classes of intangible assets labeled: People's competence, Internal Structure, External Structure. Value Creation modes are: (1) growth (2) renewal; (3) utilization/efficiency; and (4) risk reduction/stability.
1994	Skandia Navigator™	Edvinsson and Malone (1997)	SC	Intellectual capital is measured through the analysis of up to 164 metric measures (91 intellectually based and 73 traditional metrics) that cover five components: (1) financial; (2) customer; (3) process; (4) renewal and development; and (5) human.

1996	Citation-Weighted Patents	Bontis (1996)	DIC	A technology factor is calculated based on the patents developed by a firm. Intellectual capital and its performance is measured based on the impact of research development efforts on a series of indices, such as number of patents and cost of patents to sales turnover, that describe the firm's patents.
1996	Technology Broker	Brooking (1996)	DIC	Value of intellectual capital of a firm is assessed based on diagnostic analysis of a firm's response to twenty questions covering four major components of intellectual capital.
1997	IC-Index ™	Roos, Roos, Dragonetti and Edvinsson (1997)	SC	Consolidates all individual indicators representing intellectual properties and components into a single index. Changes in the index are then related to changes in the firm's market valuation.

1997	Value Added Intellectual Coefficient (VAIC™)	Pulic (1997)	ROA (doesn't quite fit any of the categories)	Measures how much and how efficiently intellectual capital and capital employed create value based on the relationship to three major components: (1) capital employed; (2) human capital; and (3) structural capital.
1997	Calculated Intangible Value	Stewart (1997) Luthy (1998)	ROA	Calculates the excess return on hard assets then uses this figure as a basis for determining the proportion of return attributable to intangible assets.
1997	Economic Value Added (EVA™)	Stewart (1997)	ROA	Calculated by adjusting the firm's disclosed profit with charges related to intangibles. Changes in EVA provide an indication of whether the firm's intellectual capital is productive or not.
1997	Market-to-Book Value	Stewart (1997) Luthy (1998)	MCM	The value of intellectual capital is considered to be the difference between the firm's stock market value and the company's book value.

1998	Investor assigned market value (IAMV ™)	Standfield (1998)	MCM	Takes the Company's True Value to be its stock market value and divides it into Tangible Capital + (Realized IC + IC Erosion + SCA (Sustainable Competitive Advantage)
1998	Accounting for the Future (AFTF)	Nash H. (1998)	DIC	A system of projected discounted cash-flows. The difference between AFTF value at the end and the beginning of the period is the value added during the period.
1998	Inclusive Valuation Methodology (IVM)	McPherson (1998)	DIC	Uses hierarchies of weighted indicators that are combined, and focuses on relative rather than absolute values. Combined Value Added = Monetary Value Added combined with Intangible Value Added.
1999	Knowledge Capital Earnings	Lev (1999)	ROA	Knowledge Capital Earnings are calculated as the portion of normalized earnings over and above expected earnings attributable to book assets.

2000	Total Value Creation, TVC™	Anderson & McLean (2000)	DIC	A project initiated by the Canadian Institute of Chartered Accountants. TVC uses discounted projected cash-flows to re-examine how events affect planned activities.
2000	Intellectual Asset Valuation	Sullivan (2000)	DIC	Methodology for assessing the value of Intellectual Property.
2000	The Value Explorer™	Andriessen & Tiessen (2000)	DIC	Accounting methodology proposed by KMPG for calculating and allocating value to 5 types of intangibles: (1) Assets and endowments, (2) Skills & tacit knowledge, (3) Collective values and norms, (4) Technology and explicit knowledge, (5) Primary and management processes.
2001	Knowledge Audit Cycle	Marr & Schiuma (2001)	SC	A method for assessing six knowledge dimensions of an organization's capabilities in four steps. 1) Define key knowledge assets. 2) Identify key knowledge processes. 3) Plan actions on knowledge processes. 4) Implement and monitor improvement, then return to 1).

2002	Meritum guidelines	Meritum Guidelines (2002)	SC	An EU-sponsored research project, which has yielded a framework for management and disclosure of Intangible Assets. 1) define strategic objectives, 2) identify the intangible resources, 3) actions to develop intangible resources. Three classes of intangibles: Human Capital, Structural Capital and Relationship Capital.
2002	Value Chain Scoreboard™	Lev B. (2002)	SC	A matrix of non-financial indicators arranged in three categories according to the cycle of development: Discovery/Learning, Implementation, Commercialization.
2002	IC Rating ™	Edvinsson (2002)	SC	An extension of the Skandia Navigator framework incorporating ideas from the Intangible Assets Monitor; rating efficiency, renewal and risk.

2003	Danish guidelines	Mouritzen, Bukh & al. (2003)	SC	A recommendation by government-sponsored research project for how Danish firms should report their intangibles publicly. Intellectual capital statements consist of 1) a knowledge narrative, 2) a set of management challenges, 3) a number of initiatives and 4) relevant indicators.
2004	Topplinjen/Business IQ	Sandvik (2004)	SC	A combination of four indices; Identity Index, Human Capital Index, Knowledge Capital Index, Reputation Index. Developed in Norway by consulting firm Human capital group.

Source: Intellectual Capital Valuation Methods: Methods for Measuring Intangible Assets (on-line). Karl-Erik Sveiby: Internet Version, July 2004.
Available:http://www.sveiby.com/articles/intangiblemehtods.html,