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Readers may send popular articles of topical interest in English to the editor email address (jms.tamilnadu@gmail.com)
AN EMPIRICAL STUDY ON THE CONSUMER’S PERCEPTION REGARDING THE SWOT FACTORS IN INDIAN BANKS

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ABSTRACT: The stiff competition and advent of new technological innovations in banking system has made the industry highly challenging and vulnerable to sustain the completion. It forces the service providers to meet or exceed the target customers’ satisfaction with quality of services expected by them. It becomes imperative to thoroughly scan the environment in which the firm survives. Hence the present study attempted to understand the consumers’ perception regarding the SWOT factors in the banking industry. The study concludes that the most prioritized factors among Strength and weakness being employability and unstructured organization whereas opportunity and threat factors being customized services and criticisms respectively. To achieve the objectives a survey of 287 respondents were collected and analyzed through average score methods.

INTRODUCTION

A business planning tools that emphasis on the identification of strengths, weaknesses, opportunities and threats of a strategic business unit is SWOT analysis. Among these factors to strength and weakness is internal environment and opportunity and threats are external environmental factors persisting in the concern industry. The SWOT analysis is one of the strategic tools to identify and strengthen the core competencies of the firm. Competitor, industry, market trends and potential activity are all considered in the analysis. Banking industries is no exemption from this rule of surviving in cut-through competition and sustaining in the business.

Banking strategies are experiencing various transformations, as the overall scenario has brought in tremendous changes. Most of the banks had adopted fierce cost cutting measures to sustain their competitiveness. Owing to incredible changes and growth opportunities for banking industry these strategies are turning obsolete. Almost all the growth related strategies of a bank revolve around customer satisfaction. Superior customer relationship management practice would enhance the achievement of short term as well as long term objectives of the bankers. This demands this efficient and accurate customer database management system and a troop of well trained sales force team which can force to develop and sustain long term profitable customers.

Strength

- Indian banks are favorably on growth and profitability.
- Policies and regulation to help strengthen the sector.
- Bank lending has been a significant driver of GDP growth and employment.
- Extensive reach through vast networking and growing number of branches and ATMs, able to reach even the remote corners of the country
- Strong international network of banks.
- High end banking technology with core banking.

Weakness

- Need to strengthen institutional skill levels especially in sales and marketing, service operations, risk operations, risk management and overall organizational performance ethic and strengthen human capital.
- Strength the skill levels
- Cost of intermediation remains high and bank penetration is limited to only few segments.
- Structural weakness such as fragmented industry structure.
- Impediments in sectoral reforms.

Opportunity

- Discontinuous growth driven by new products and services.
- Intensified competition from foreign banks triggering the Indian banks to perform more.
- Liberalization
- Favorable Government rural schemes
- More expansion in untapped rural markets
- Urban market banking and retail banking
Threats
- Threats of stability of system
- Rise in inflation figures which would lead to increase interest rates
- Increase in the number of foreign players would pose a threat to the banks

AVERAGE rank analysis
This technique is mainly employed to ascertain the priority of the respondents on the various aspects relating to the study. In this study, this technique is employed to identify the priority of the respondents on the various aspects relating to SWOT factors considered in the strength.

Based on the consolidated opinion of the respondents the average rank is calculated and the final rank is affixed using the criterion “lesser the average rank more is the priority” and the results are presented separately for strength, weakness, opportunity and threat related factors in different tables with suitable interpretations.

Strength factors in banking sectors
The following are the important technology related factors considered in the study in assessing the strength of the banking sectors.

- Brand
- Profitability
- Policies and regulation
- Employability
- Infrastructure and location
- Economic growth

The table 1 describes the results of average rank analysis in assessing the importance among the strength related factors towards technology in banking sectors.

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Note: AR- average rank, FR – Final rank

It is found from the table that the respondent irrespective of their personal classifications have given top priority towards employability (A4), followed by policies and regulation (A3), profitability (A2) as the strength factors towards technology in banking sector.

It is concluded that among the various strength factors considered for the study the respondents considered the employability as the important strength factors towards technology in banking sector.

Weakness factors in banking sectors
The following are the important technology related factors considered in the study assessing the weakness of the banking sectors.

- Lack of institutional skill levels in overall performance
- Cost of intermediation
- Limited market segment
- Unstructured organization
- Sectoral impediments / Polices
- Resistance to technological change
The table 2 describes the results of average rank analysis in assessing the important weakness related factors towards technology in banking sectors.

The results are presented in terms of personal factors, average rank and the final rank on the importance of weakness related factors towards technology in banking sectors.

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Note: AR- average rank, FR – Final rank

It is found from the table that the respondent irrespective of their personal classifications have given top priority towards unstructured organization (B₄), followed by Limited market segment (B₃), Cost of intermediation (B₂) as the weakness factors towards technology in banking sector.

It is concluded that among the various weakness factors considered for the study the respondents considered the unstructured organization as the important weakness factors towards technology in banking.

Opportunity factors in banking sectors

The following are the important technology related factors considered in the study assessing the opportunity of the banking sectors.

- New product and services
- Strategic Alliance
- Customized Services
- Customer relationship Management
- Tapping the rural market
- Technology advantage

The table 3 describes the results of average rank analysis in assessing the important opportunity related factors towards technology in banking sectors.

The results are presented in terms of personal factors, average rank and the final rank on the importance of opportunity related factors towards technology in banking sectors.
It is found from the table that the respondents irrespective of their personal classifications have given top priority towards Customized Services (C3), followed by Strategic Alliance (C2), Customer relationship Management (C4) as the opportunity factors towards technology in banking sector.

It is concluded that among the various opportunity factors considered for the study the respondents considered the Customized Services as the important opportunity factors towards technology in banking.

### Threat factors in banking sectors

The following are the important technology related factors considered in the study assessing the threats of the banking sectors.

- Unstable system
- Rise in inflation
- Global markets trends
- Regulatory bodies rules and regulations
- Stiff competition in financial market
- Criticism

The table 4 describes the results of average rank analysis in assessing the important threats related factors towards technology in banking sectors.

The results are presented in terms of personal factors, average rank and the final rank on the importance of threats related factors towards technology in banking sectors.
Table 4: Average rank – personal factors and the importance of threat related factors

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Note: AR- average rank, FR – Final rank

It is found from the table that the respondent irrespective of their personal classifications have given top priority towards Criticism (D6), followed by Global markets trends (D3), Stiff competition in financial market (D5) as the threats factors towards technology in banking sector.

It is concluded that among the various threats factors considered for the study the respondents considered the Criticism as the important threats factors towards technology in banking.

**Conclusion**

It is concluded that the most prioritized factors among the various strength factors considered for the study the respondents considered the employability as the important strength factors towards technology in banking sector and among the various weakness factors considered for the study the respondents considered the unstructured organization as the important weakness factors towards technology in banking. When the external factors considered for opportunity available the customized Services were considered as the important opportunity factors towards technology in banking and finally threat factors being criticisms.

**Bibliography**


*****
Impact of FDI and FII on the Indian Stock Market during Recent Recession Period: An Empirical Study

Arindam Banerjee
Faculty Member of Institute of Cost Accountants of India, Kolkata, India.

Abstract: The era 90’s saw very significant policy changes introduced in the sphere of financial sector, foreign trade, public sector and social sector. The year 1991 witnessed the process of liberalization and globalization that hit the Indian economy and pushed our country to break open the “Inward Looking” policy when the emphasis was accorded to protectionism and import substitution. Since 1991, India has proved to be a key player in the world. Ours country interaction has increased with many economies ties, political harmony, tourism trade and services more significantly in the area of investment. The present study was conducted by me with the aim to understand the impact of FDI and FII on Indian Stock Market (BSE and Nifty) during the recession period. It was found from the study that FDI had a significant influence on the Indian Stock market during recession while FII negatively influenced the Indian Stock Market.

Key Words: Multiple Regression, Sensex, Nifty, FDI and FII

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1. Introduction:
Foreign Direct Investment has been increasingly dramatically across the world. Almost all the countries in the world are realizing the importance of foreign capital’s role in the rapid industrial and economic development. It contributes a lot to the economic growth and industrial development across the world. It even acts as a catalyst in the process of domestic industrial development. Further it helps in speeding up economic activity and brings with it other scarce productive factors such as technical know-how and managerial experience, which are essential for economic development.

FDI plays an important role in the development process of a country. It has potential for making contribution to the development through the transfer of financial resources, technology and innovative and improved management techniques along with raising productivity. Developing countries like India need substantial foreign inflows to achieve the required investment to accelerate economic growth and development.

1.1 Meaning of FDI and FII
FDI is generally defined as “A form of long term international capital movement made for the purpose of productivity activity and accompanied by the intention of managerial control or participation in the management of the foreign firm,”

According to the International monetary fund, FDI can be defined as “An Investment that is made to acquire a lasting interest in an enterprise operating in an economy other than that of the investor. The investor’s purpose is to have an effective voice in the management of the enterprise.”

The World Investment Report of the United Nations Conference on trade and development (UNCTAD) defines FDI as “International Investment that reflects the objective of a resident entity in one economy (Foreign Direct Investor or Parent Enterprise) obtaining “Lasting Interest” in and control of an enterprise resident in an economy other than that of foreign direct investor.” Lasting interest implies the existence of a long-term relationship between a direct investor and the enterprise and a significant degree of influence on the management of the enterprise.

FDI should not be confused with portfolio investment, which doesn’t seek management control, but it is motivated by profit. Portfolio investment occurs when an individual investor invest, mostly through stock brokers in the stocks of the foreign countries in search of profit opportunities.

FII (Foreign Institutional Investor) is defined as an investor or investment fund that is from or registered in a country outside of the one in which it is currently investing. Institutional investors include hedge funds, insurance companies, pension funds and mutual funds. FII must register with SEBI (Security Exchange Board of India) to participate in Stock Markets in India. (Source: Investopedia)

1.2 Recession:
The NBER (National Bureau of Economic research) defines an economic recession as “a significant decline in the economic activity spread across the country, lasting more than a few months, normally visible in real decline in the GDP growth, real stagnation in personal income, rising unemployment level (Non-Firm Payroll) decrease in industrial production and considerable deterioration in the wholesale - retail sale. (Source: Business Cycle Expansion and Contraction — NBER) .NBER has defined the recent global financial crisis as staring from December, 2007 and ending on June 2009.
Impact of Recession on India:
The impact of the global crisis on India can broadly be divided into three different aspects:
(1) the immediate direct impact on its financial sector;
(2) an indirect impact on economic activities and
(3) potential long term geopolitical implications. Fortunately, India, like most of the emerging economies, was lucky to avoid the first round of adverse effects because its banks were not overly exposed to subprime lending. However, the indirect impact of the crisis has affected India quite badly. The liquidity squeeze in the global market following Lehman Brothers collapse had serious implications for India, as it not only led to massive outflows of Foreign Institutional Investment (FII) but also compelled Indian banks and companies to shift their credit demand from external sources to the domestic banking sector. The present paper tries to investigate the Impact of FDI and FII on Indian Stock Market during the recent recession period by using statistical tools.

2. Review of Literature:
It is proposed to some studies in brief referred by me while conducting the present study:

Jatinder Loomba (2012), in his research paper “Do FIIs impact volatility of Indian Stock Market?” in International Journal of Marketing, Financial Services & Management Research have tried to investigate into the trading behavior of FII and BSE Sensex. The study concludes that there is a significant positive correlation between FII activity and its effect on Indian Capital Market.

J.S. Pasricha (2009), in his research paper “Foreign Institutional Investor’s Impact on stock prices in India” have investigated into impact of market openings to FII on Indian stock market behavior. It was concluded from the study while there is no significant changes in Indian Stock market average returns volatility is significantly reduced after India opened its stock market to foreign investors due to ongoing globalization, liberalization and privatization process.

Liesbeth Colen, Miet Maertens, Jo Swinnen (2008) has worked on “FDI as an Engine for Economic Growth and Human Development. The objective of the study was to analyze the importance of FDI on developing countries with a view to highlight the trend of the FDI flows. The study further tries to evaluate the effect of FDI on economic growth as well as poverty reduction.

Ikara (2003) emphasizes that FDI is the key element in generating growth and thus is a very important ingredient for poverty reduction by raising total Factor productivity and efficiency of resource use.

3. Motivation and Objective of the Study:
Recent Recession/ Global financial crisis had adversely affected everybody’s life one way or the other. My main motivation and objective of undertaking the present study is to understand the impact of FDI and FII on Indian Stock Market during recession period. Stock Market is considered to be the barometer of health of an Economy. FDI and FII are both important and significant source of Foreign Inflow in Economy. With India opening its gate for foreign investment in this era of globalization and liberalization era both the source play a very important role in development of the economy. Whether actually FDI or FII or both impacted the stock market in recession period is a matter of curiosity which actually motivated me to pursue my research in this area.

4. Research Methodology:
The present study undertaken by me tries to study the impact of FDI and FII in terms of equity on Indian Stock Market. The data related to the study has been collected from BSE website (for Sensex Data), NSE website (Nifty), Website of DIPP (Department of Industrial Promotion and Policy) (FDI Data) and SEBI Website (FII Data). A period of 18 months (January 2008 to June, 2009) is taken for the study period during the period of recession. The statistical tool of correlation and multiple regression analysis was used to derive at a conclusion. For determining the BSE and NSE average it is calculated on basis of average of closing Sensex and Nifty for the number of trading days for each month from January, 2008 to June, 2009.

5. Analysis:
A. FDI vs. FII

The Table 1 below represents FDI and FII inflows in crores rupees. The inflow of FDI and FII are shown in terms of equity inflows only. The months taken into consideration is from January 2008 to June, 2009 (18 months) the period representing the recent global financial crisis and substantiated by NBER. The table also represents the BSE Sensex and Nifty during the aforesaid period
Table 1.

<table>
<thead>
<tr>
<th></th>
<th>FDI Inflows (Equity)</th>
<th>NIFTY</th>
<th>SENSEX</th>
<th>Trading Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan-08</td>
<td>6,960</td>
<td>-13,035.70</td>
<td>5756.354348</td>
<td>19325.65</td>
</tr>
<tr>
<td>Feb-08</td>
<td>22,529</td>
<td>1,733.30</td>
<td>5201.564286</td>
<td>17727.54</td>
</tr>
<tr>
<td>Mar-08</td>
<td>17,932</td>
<td>-130.4</td>
<td>4769.497222</td>
<td>15838.38</td>
</tr>
<tr>
<td>Apr-08</td>
<td>15005</td>
<td>1,074.80</td>
<td>4901.905</td>
<td>16290.99</td>
</tr>
<tr>
<td>May-08</td>
<td>16563</td>
<td>-5,011.50</td>
<td>5028.6625</td>
<td>16945.65</td>
</tr>
<tr>
<td>Jun-08</td>
<td>10,044</td>
<td>-10,095.00</td>
<td>4463.788095</td>
<td>14997.28</td>
</tr>
<tr>
<td>Jul-08</td>
<td>9627</td>
<td>-1,836.80</td>
<td>4124.604348</td>
<td>13716.18</td>
</tr>
<tr>
<td>Aug-08</td>
<td>9995</td>
<td>-1,211.70</td>
<td>4417.1175</td>
<td>14722.13</td>
</tr>
<tr>
<td>Sep-08</td>
<td>11676</td>
<td>-8,278.10</td>
<td>4206.685714</td>
<td>13942.81</td>
</tr>
<tr>
<td>Oct-08</td>
<td>7,284</td>
<td>-15,347.30</td>
<td>3210.2225</td>
<td>10549.65</td>
</tr>
<tr>
<td>Nov-08</td>
<td>5305</td>
<td>-2,598.30</td>
<td>2834.786111</td>
<td>9453.957</td>
</tr>
<tr>
<td>Dec-08</td>
<td>6626</td>
<td>1,750.10</td>
<td>2895.797619</td>
<td>9513.584</td>
</tr>
<tr>
<td>Jan-09</td>
<td>13,346</td>
<td>-4,245.30</td>
<td>2854.3625</td>
<td>9350.417</td>
</tr>
<tr>
<td>Feb-09</td>
<td>7,329</td>
<td>-2,436.60</td>
<td>2819.205263</td>
<td>9188.033</td>
</tr>
<tr>
<td>Mar-09</td>
<td>10,023</td>
<td>530.3</td>
<td>2802.7275</td>
<td>8995.451</td>
</tr>
<tr>
<td>Apr-09</td>
<td>11,708</td>
<td>6,508.20</td>
<td>3359.829412</td>
<td>10911.2</td>
</tr>
<tr>
<td>May-09</td>
<td>10,168</td>
<td>20,117.20</td>
<td>3957.9625</td>
<td>13046.14</td>
</tr>
<tr>
<td>Jun-09</td>
<td>12,335</td>
<td>3,830.00</td>
<td>4436.370455</td>
<td>14782.47</td>
</tr>
</tbody>
</table>

Source: SEBI Website for FII data, DIPP (Department of Industrial Promotion and Policy) for FDI data, BSE Website for Sensex data, NSE Website for Nifty data

In the above table, FDI and FII are represented in crores of rupees. Nifty and Sensex average is calculated on basis of average of closing Nifty and Sensex for the number of trading days mentioned in the days column for each and every month. (Eg 23 trading days in Jan 2008, 21 trading days in Feb 2008 etc).

If we observe the graphical representation (Graph 1) below of FDI inflow for the period of recession then a downward trend is observed with the lowest being in November, 2008 and slowly picking from April, 2009 indicating a hope of end of recession period. The graph 1 is produced as below:

If we observe the graphical representation (Graph 2) below of FII inflow for the period of recession then a flux of negative FII are observed during different months reflecting a panic in FII who were withdrawing funds from the stock market and thus having an adverse effect on both the Sensex and Nifty and slowly picking from May, 2009 indicating a hope of end of recession period.
B. Impact of FDI and FII on BSE SENSEX (during recession period)

To study the impact of FDI and FII on BSE Sensex during the recession period, FDI and FII are taken as independent variables and BSE Sensex as dependent variable. SPSS 16 has been used for Multiple linear regression analysis purpose. It is observed from the model Summary (Table 2) below the R square is .342 showing the relationship between Sensex (Dependent Variable) and FDI and FII (as Independent Variables). It indicates that 34.2% of the variation in Sensex is explained by the model. Though it is not very high but as it is above .25 we can proceed with the model.

The result of Table 2 (Regression Analysis) is produced below:

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.585a</td>
<td>.342</td>
<td>.255</td>
<td>2854.161</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), foreign institutional investor, foreign direct investment

Table 3

<table>
<thead>
<tr>
<th>Coefficientsa</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>8186.511</td>
<td>1965.716</td>
<td></td>
</tr>
<tr>
<td>foreign direct investment</td>
<td>.435</td>
<td>.159</td>
<td>.583</td>
</tr>
<tr>
<td>foreign institutional investor</td>
<td>-.102</td>
<td>.090</td>
<td>-.245</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Sensex

From the above Table 3 it can be observed from the co linearity statistics that VIF (Variance Inflation Factor) is below 2 for both the FDI and FII, therefore multicollinearity problem doesn’t exist hence the regression analysis can be proceeded.

To test the significance of FDI it can be observed from the above table that t value of Foreign Direct Investment (FDI) is 2.727 which is beyond the range of -2 and +2. Also it can be observed that p value is .016. Since p value is less than .05, hence it can be concluded that FDI is a significant factor influencing the BSE Sensex.
To test the significance of FII it can be observed from the above table that t value of Foreign Institutional Investors (FII) is -1.144 which is within the range of -2 and +2. Also it can be observed that p value is .271. Since p value > .05, hence it can be concluded that FII is an insignificant factor influencing the BSE Sensex.

C. Impact of FDI and FII on NIFTY (during recession period)

To study the impact of FDI and FII on Nifty during the recession period, FDI and FII are taken as independent variables and Nifty as dependent variable. SPSS 16 has been used for linear regression analysis purpose. It is observed from the model Summary (Table 4) below the R square is .334 showing the relationship between Nifty (Dependent Variable) and FDI and FII (as Independent Variables). It indicates that 33.4% of the variation in Nifty is explained by the model. Though it is not very high but as it is above .25 we can proceed with the model.

Table 4

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>.578*</td>
<td>.334</td>
<td>.245</td>
<td>826.400</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>I (Constant)</td>
<td>2547.855</td>
<td>569.158</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>foreign direct investment</td>
<td>.124</td>
<td>.046</td>
<td>.578</td>
<td>2.685</td>
<td>.017</td>
<td>.959</td>
<td>1.043</td>
</tr>
<tr>
<td>foreign institutional investor</td>
<td>-.028</td>
<td>.026</td>
<td>-.236</td>
<td>-1.095</td>
<td>.291</td>
<td>.959</td>
<td>1.043</td>
</tr>
</tbody>
</table>

Table 5:

From the above Table 5 it can be observed from the co linearity statistics that VIF (Variance Inflation Factor) is below 2 for both the FDI and FII, therefore multi collinearity problem doesn’t exist hence the regression analysis can be proceeded.

To test the significance of FDI it can be observed from the above table that t value of Foreign Direct Investment (FDI) is 2.685 which is beyond the range of -2 and +2. Also it can be observed that p value is .017. Since p value is less than .05, hence it can be concluded that FDI is a significant factor influencing the Nifty.

To test the significance of FII it can be observed from the above table that t value of Foreign Institutional Investors (FII) is -1.095 which is within the range of -2 and +2. Also it can be observed that p value is .291. Since p value > .05, hence it can be concluded that FII is an insignificant factor influencing the Nifty.

D. Correlation between FDI, FII, Sensex and Nifty (during Recession Period)

Correlation is basically used to study the statistical relationship between FDI, FII, Sensex and Nifty.

Table 6:

Correlation Matrix
It can be observed from the above table that there is an existence of moderate positive correlation between Sensex and FDI (.534) and Nifty and FDI (.530) during the recession period. But there is a negative correlation between Sensex and FII (-.127) and Nifty and FII(-.119) during the recession. If we observe the correlation between the Sensex and Nifty it reflects a high positive correlation during the recession.

5.1 Testing of Hypothesis
We can observe from the above empirical study that FDI has been a significant factor influencing both Sensex and Nifty during the recession period but FII had been insignificant factor influencing both Sensex and Nifty during recession period. If we summarize the results of the paper and draw certain hypothesis and test such hypothesis.

The null hypothesis and alternative hypothesis of Sensex and FDI are as follows:

\[ H_0 = \text{FDI Inflows in India and Sensex are independent during recession period.} \]
\[ H_1 = \text{FDI Inflows in India and Sensex are dependent during recession period.} \]

The p value in Table 3 related to FDI Inflow is .016 which is less .05 so null hypothesis is not accepted and hence alternative hypothesis is accepted. Hence \( H_1 \) is accepted, thus **FDI Inflows in India and Sensex are dependent during recession period.**

The null hypothesis and alternative hypothesis of Nifty and FII are as follows:

\[ H_0 = \text{FII Inflows in India and Nifty are independent during recession period.} \]
\[ H_1 = \text{FII Inflows in India and Nifty are dependent during recession period.} \]

The p value in Table 3 related to FII Inflow is .271 which is greater than .05 so null hypotheses is accepted. Hence \( H_0 \) is accepted, thus **FII Inflows in India and Nifty are independent during recession period.**

The null hypothesis and alternative hypothesis of Nifty and FDI are as follows:

\[ H_0 = \text{FDI Inflows in India and Nifty are independent during recession period.} \]
\[ H_1 = \text{FDI Inflows in India and Nifty are dependent during recession period.} \]

The p value in Table 5 related to FDI Inflow is .017 which is less .05 so null hypothesis is not accepted and hence alternative hypothesis is accepted. Hence \( H_1 \) is accepted, thus **FDI Inflows in India and Nifty are dependent during recession period.**

The null hypothesis and alternative hypothesis of Nifty and FII are as follows:

\[ H_0 = \text{FII Inflows in India and Nifty are independent during recession period.} \]
\[ H_1 = \text{FII Inflows in India and Nifty are dependent during recession period.} \]

The p value in Table 5 related to FII Inflow is .291 which is greater than .05 so null hypothesis is accepted. Hence \( H_0 \) is accepted, thus **FII Inflows in India and Nifty are independent during recession period.**

Summary:
- FDI Inflows (Equity) in India and Sensex are dependent during recession period.
- FII Inflows (Equity) in India and Sensex are independent during recession period.
- FDI Inflows(Equity) in India and Nifty are dependent during recession period.
- FII Inflows (Equity) in India and Nifty are independent during recession period.

Table 9.
Investigating into the Beta Values:

<table>
<thead>
<tr>
<th></th>
<th>Sensex (Beta Values)</th>
<th>Nifty (Beta Values)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI</td>
<td>.583</td>
<td>.578</td>
</tr>
<tr>
<td>FII</td>
<td>-.245</td>
<td>-.236</td>
</tr>
</tbody>
</table>

From the above table (Table 9), when we investigate into the beta values we find that FDI is positively influencing Sensex and Nifty while FII is negatively influencing both Sensex and Nifty during recession period.

The curve estimation also states the beta relationship between the Sensex and FDI, Sensex and FII, Nifty and FDI and Nifty and FII.
If we look into the FII Inflow (in INR crores) during the financial years it can be observed from the following table:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>FII (Equity)</td>
<td>44122.7</td>
<td>48800.5</td>
<td>25236</td>
<td>53403.8</td>
<td>-47706</td>
<td>110220.6</td>
<td>110120.8</td>
<td>43737.6</td>
<td>130284</td>
</tr>
</tbody>
</table>

It can be observed that the FII Inflows in 2008-09 (recession period) is -47706 crores.

6. Conclusions

FDI is often preferred over FII as a major source of foreign investment. It is also seen from the study that during recession period FDI significantly influenced the stock market in India while FII was insignificant factor having impact on Indian Stock Market. Also because of the panic caused in the stock market due to recession FIIIs took out huge amount of investment from Indian Stock Market. India has to pave the path and strategies accordingly so as to increase the FDI and FII Inflow in India. The gates for liberalization opened in the year 1991 when India opened up to outside world. A number of factors have resulted in red tape and delay in FDI Inflow in the country. Among the various factors corruption is one of the major factors. The gap between what amount of FDI is approved and what actually flows in should be reduced to the maximum extent. This can be done by having control over issues like procedural delay, inflation and corruption among other factors.

But today the condition is looking much brighter. India has come out of recession and the crisis in European debt market also seems to be over. FDI Inflow may have been affected by such factors in India but as the scenario is much better, India should try to capitalize and try to attract FDI in India by liberalizing the policy. At the “Focus India Show” in Chicago Indian Commerce and Industry Minister Mr. Kamal Nath told the US investors that India has emerged as the “Best Destination” for FDI and joint ventures. He also described India economy as “India: The Fastest Growing Free Market Democracy”.

India has to fully unravel its FDI potential. Being a country whose capital market is one of the strongest which is booming coupled with strong foreign exchange reserve and having positive annual growth, Indian economy is witnessing a high trajectory growth. These reasons may be ample for attracting strong FDI and FIIInflow in India and Indian government should take all possible measures so as to attract FDI and FII Inflow.

7. References:

Customer’s Expectations of Hospitality Services- A Study on Five Star Hotels in Hyderabad City

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Dr.B.R.Ambedkar Open University, Hyderabad, A.P, India

ABSTRACT: This paper analyzes the customer’s expectations and their satisfaction levels with regard to services offered by five star hotels in Hyderabad city. A structured questionnaire has been used to obtain feedback from the 150 customers of from five star hotels based on convenience sample method. Statistical tools such as Chi-square and Pearson’s correlation were employed to validate the results. Findings of the study are (i) there is a relationship between expectations of the customers and the services provided by the star hotels (ii) there is a relationship between customers satisfaction with regard to price charged by the star hotels for the quality of services offered. It is also proved that there is a positive correlation among the above presented parameters. It is suggested that the application of customer relationship management (CRM) is the need of the hour to fulfill the expectations of customer services.

Keywords: Customer expectations; Loyalty; Satisfaction; Retention; Strategy;

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INTRODUCTION
Customer life cycle starts with identification of customer needs, acquisition of customers, development of customers and finally retaining the customers. Above all stages of life cycle the very first and the most important stage is identification of customer needs. This aspect influences the customer right from the time of selection of the hotel itself. According to customer expectations, he selects the respective hotel where he can fulfill his requirements with utmost personalization and customization. To understand certain expectations and services one should not forget the basic characteristics of Hospitality Sector. The services features include (i) perishability- services are perishable and it cannot be stored for future periods. Services can be stored to some extent for future with the help of tangible goods but not fully. (ii) intangibility- services are intangible i.e. they cannot touch or taste. While the physical structure and certain components of the hospitality product are tangible. (iii) inseparability- the special characteristic of services is production and consumption is inseparable. Services should be consumed when they are produced and (iv) variability- services can be deliberately varied to meet the specific needs of individual customers.

IMPORTANCE OF CUSTOMERS EXPECTATIONS
Customer expectations are beliefs about service delivery that serve as standards or reference points against which performance is judged. Because customers compare their perceptions of performance with these reference points when evaluating service quality, thorough knowledge about customer expectations is critical to services marketers. Knowing what the customer expects is the first and possibly most critical step in delivering good quality service. Being wrong about what customers want can mean losing a customer’s business when another company hits the target exactly. Being wrong can also mean expending money, time and other resources on things that do not count to the customer. Being wrong can even mean not surviving in a fiercely competitive market.

REVIEW OF LITERATURE
Karnikeya Budhwar (2004) in his article “Understanding the success factors for independent restaurants in the Delhi / Gurgaon region, an analysis of the gap between management perceptions and customer expectations”, opines that the operators must incorporate the need to be flexible in their thinking. Operators must not neglect the long term impact of access to their facilities as it does have an impact on repeat clientele. Gundersen et al. (1996) in his research article “Hotel guest satisfaction among business travellers: What are the important factors? “, emphasizes that the quest for improved quality, hospitality industry managers often face two major obstacles viz. they do not know what aspects the guest considers to be important when evaluating the hotel experience, and they do not have reliable and valid instruments for measuring quality perceptions. Gronross (1987) in his article “A service quality model and its marketing implementations’, points that the functional quality is a more important dimension of perceived service than technical quality. Essence of service quality lies in improving the functional quality of a firm’s service by managing the buyer-seller interaction as compared to traditional marketing activities. He emphasized the need for more research on consumer’s view of service quality.

Parasuraman, Zenithal and Berry (1985) in their article, “A conceptual model of Service Quality and its implications for Future Research” revealed that it is very important to work with customers to understand their expectations. As research has consistently indicated that one of the major reasons for poor service quality is the gap between managers’ perceptions about the customer’s expectations and actual customer’s expectations. This article stressed why there is gap between management and customers. Su and Allan (2004) have focused on hotel guest comment cards (GCCs) and customer satisfaction management schemes in Taiwan. Content analysis was used to determine the extent to which each hotel's comment card design corresponded to the identified best practice criteria. Results revealed that no single hotel analyzed within the survey sample of study meets all identified best practice criteria for their GCCs. Akbaba (2005) has said that the role of service quality in the success of hotel businesses cannot be denied. It is vital for
the hotel managers to have a good understanding on what exactly the customers want. Identifying the specific expectations of customers, the dimensions of the service quality, and their relative importance for customers for each specific segment of hotel industry would definitely help managers in the challenge of improving the service quality.

NEED FOR THE STUDY
In today’s era of liberalization and globalization, every industry faces increasing competition. Hotel industry is no exception. Rather, the presence of so many hotel groups in the market ensures that the level of competition remains considerably higher than many other service industries. It becomes increasingly difficult to keep one’s market share intact for a long time. For any hotel, a reasonable utilization of its room capacity is essential to earn a reasonable rate of return. Hence, retaining regular customers and attracting new customers are the priorities for the management. Any hotel which wants to retain the customers in the long run will have to constantly outperform the competitors when it comes to customer satisfaction. This requires that customer dissatisfaction should be avoided at any cost.

OBJECTIVES OF THE STUDY
The main objective of the study is to analyze the expectations of customers towards services provided by the five star hotels in Hyderabad city. The specific objectives are:

1. To study the factors influencing customers in selection of star hotels;
2. To analyze the satisfaction level of the customers with the services of star hotels; and
3. To examine the co-relation among variables which are used by hotels to attract and retain customers.

HYPOTHESES
1. There is no relationship between expectations of the customers and the services provided by the five star hotels.
2. There is no relationship between customers satisfaction with regard to price charged by the five star hotels for the quality of services offered.

METHODOLOGY
Scope and period of the study - is restricted to five star hotels in Hyderabad city out of 11 star hotels in Hyderabad city. But only seven five star hotels are taken into consideration for the study as convenient sample. Tools of data collection and analysis- a simple structured questionnaire designed and canvassed among the sample respondents from 150 customers of seven different five star hotels in Hyderabad city. Simple percentages, chi-square and correlations tests were used to draw the inferences.

RESULTS AND DISCUSSION
Sources of information about the hotel(s): Customers are usually categorized into two different types as new customers i.e., first time visitors and existing customers i.e., customer’s already experienced once or more than one time. A new customer usually gathers the information about a particular hotel through an advertisement in media, from friends and relatives, colleagues, tie ups with other organizations or from travel agents and others. An attempt has been made to analyze sources of information at the time of selection of the hotel.

<table>
<thead>
<tr>
<th>Responses</th>
<th>No. of Respondents</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Advertisement</td>
<td>62</td>
<td>41</td>
</tr>
<tr>
<td>Friends &amp; Relatives</td>
<td>62</td>
<td>41</td>
</tr>
<tr>
<td>Tie-up with the Organization</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 1 reveals that the majority (41%) of respondents revealed that they have come to know about the hotel through friends and relatives. An equal number of respondents said that they have come to know through media advertisement. Whereas the organizations which had tie-up with particular hotels has become source of information which accounted for 4 per cent, followed by others worth only 13 per cent. Hence, it is concluded that media advertisement and friends & relatives has played an equal role in promotion and as a source of information about the hotels. Word of mouth through friends & relatives and media advertisement could reach as many no. of customers as possible and made them to visit the particular hotel.

Factors which influence the customers for selection of a hotel: Knowing about a particular hotel and its information will not be sufficient to finalize the hotel. There are certain other factors like location, price and good service which influence the selection of a hotel. The details regarding the factors influence the customers for selection of a hotel is presented in the table 2. This study reveals that there are 44 per cent of the respondents have chosen a five star hotel because of location advantage and proximity. 29 per cent respondents selected a particular hotel because of good service. 25 per cent respondents are influenced by price of the room. Very meager no. of respondents (1%) has not responded. From the above results it is clear that the majority of the respondents prefer the Five Star Hotel which has more location advantage and proximity of the hotel is near prime locations like airports, shopping malls, etc.
Table -2 Factors which influence the customers for selection of a hotel

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location Advantage and Proximity</td>
<td>66</td>
<td>44</td>
</tr>
<tr>
<td>Good Service</td>
<td>44</td>
<td>29</td>
</tr>
<tr>
<td>Price of Room</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>Un Decided</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data

Customer Preference in selection of hotel(s): There are plenty of options available these days to the travelers. They prefer to stay with their friends or relatives, stay in company guest house, stay in one star hotel, three star hotels, five star hotels or stay in lodges and so on. There are varied reasons for customers to stay in five star hotels. Table 3 presents customer preference in selection of hotel(s) that there are about 51 per cent of the respondents would like to stay with their friends or relatives instead of hotels, whereas 21 per cent of the respondent’s prefer three star hotels. 10 per cent respondents have opted company guest house. With regard to star hotels it is observed that the customers prefer one star hotel and five star hotels accounted for 8 per cent and 7 per cent respectively. Very negligible number of respondents (2%) have not expressed about their choice of accommodation. The reason may be lack of information about the hotels. Hence, it is concluded that more than half of the customers were interested to stay with their friends and relatives and spend time with them rather than preferring star hotels for their stay.

Table -3 Customer preference in selection of hotel(s)

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five Star Hotels</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Three Star Hotels</td>
<td>32</td>
<td>21</td>
</tr>
<tr>
<td>One Star Hotels</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Company Guest House</td>
<td>16</td>
<td>11</td>
</tr>
<tr>
<td>With friends &amp; relatives</td>
<td>77</td>
<td>51</td>
</tr>
<tr>
<td>None of these</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data

Kind of Services Expected by the Customers: Services offered by five star hotels are many but, these are different from one hotel to another. An attempt has been made to assess the extent of customer preference for the services provided by the hotels. Services of five star hotels are many to list, like Food Festivals, Regular innovation, laundry, recreation, rent a car, free trips, telephone, internet etc. The table 1.4 reveals the fact that 70 per cent of the customers prefer food and beverages, 51 per cent prefer recreation facilities like gym, swimming pool etc. 41 per cent avail travel agency services and 40 per cent opted that they prefer shopping arcade. 18 per cent of the respondents prefer business centre like STD, FAX, XEROX, Laundry and iron etc. Hence, it is concluded that most (70%) of the customers are found giving preference to food & beverages and recreational facilities. Understand the customer’s perspective and what the customer actually wants, and put in systems to deliver services accordingly, so that the customer knows that the hotel understands their needs accurately.

Table -4 Kind of Services Expected by the Customers

<table>
<thead>
<tr>
<th>服务</th>
<th>否</th>
<th>是</th>
<th>总计</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Beverage</td>
<td>45</td>
<td>105</td>
<td>150</td>
</tr>
<tr>
<td>Shopping Arcade</td>
<td>90</td>
<td>60</td>
<td>150</td>
</tr>
<tr>
<td>Travel Agency for car Rental/travel ticketing etc.</td>
<td>88</td>
<td>62</td>
<td>150</td>
</tr>
<tr>
<td>Recreational facilities like gym, swimming pool</td>
<td>73</td>
<td>77</td>
<td>150</td>
</tr>
<tr>
<td>Business center (phone STD, FAX,XEROX, Computers, Laundry etc.)</td>
<td>123</td>
<td>27</td>
<td>150</td>
</tr>
</tbody>
</table>

Source: Primary Data
Customer's satisfaction towards the services of the hotel(s): One of the significant areas of concern is customer’s satisfaction with the type of services, quality and facilities provided by the star hotels. Generally customer expectation towards the services, quality and facilities of the stars hotel will be high as compared to any other category of hotel and they include: price charges, brand name of the hotel and facilities in the hotel are high in five star hotels all these leads to high customer expectations too. Keeping this in view an attempt has been made to study the customer’s expectation towards the type of services, quality and facilities provided by the five star hotels. It is clear from the table 5 that 73 per cent of the respondents are satisfied, while 15 per cent of the respondents cannot say, i.e., neither they are satisfied nor dissatisfied. Only 9 per cent of the respondents have expressed that they are highly satisfied with the services and facilities provided by the star hotels. Hence, It is concluded that majority (73 %) of the customers are happy with the services and facilities offered by the select hotels. But still there is gap of 18 per cent (Can’t Say 15% and No Response 3%) of the customers neither they are satisfied nor dissatisfied.

<table>
<thead>
<tr>
<th>Table -5 Customer’s satisfaction of hotel services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
</tr>
<tr>
<td>Highly Satisfied</td>
</tr>
<tr>
<td>Satisfied</td>
</tr>
<tr>
<td>Can’t Say</td>
</tr>
<tr>
<td>No Response</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Primary data

H0: There is no relationship between expectations of the customers and the services provided by the five star hotels.

<table>
<thead>
<tr>
<th>Chi-Square Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
</tr>
<tr>
<td>Df</td>
</tr>
<tr>
<td>Asymp.Sig (2 sided)</td>
</tr>
</tbody>
</table>

The chi-square test has been applied to test validity of the results and the values that are arrived here indicate the degree of consistency among the opinions presented against respective groups. Here, the calculated value of chi-square is 23.406 at a degrees of freedom of 9 is more than the table value at 5 per cent (14.130) level of significance. This clearly indicates that the null hypothesis is rejected and the alternative hypothesis is accepted. In other words, there is a significant relationship between expectations of the customers and the services provided by the five star hotels. It is evident that the services provided by the five star hotels have been satisfying the customer’s expectations.

Customers Response for the Price Charges: To assess whether customers are happy with the price charged by the five star hotels against the quality of services offered. The results presented in table 1.6, it is evident that 30 per cent of the customers expressed that they are fully satisfied. Whereas 40 per cent of the customers expressed that they were satisfied with the price charges, followed by 17 per cent of the customers neither satisfied nor dissatisfied. But 7 per cent of the customers opined that they felt cheated with the quality of services against price charges. Hence, it is concluded that most (30% + 40%) of the customers are satisfied with the prices charged by star hotels. But still there are 30 per cent of the customers who were unhappy with the price charges of the star hotels. This means the prices charged by the star hotels are not commensurate with the services provided by the hotels.
Table 6 Customer’s response on the price charges

<table>
<thead>
<tr>
<th>Responses</th>
<th>Frequency</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully satisfied</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Satisfied</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>26</td>
<td>17</td>
</tr>
<tr>
<td>felt cheated</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Can’t say</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data

**H2: There is no relationship between customers satisfaction with regard to price charged by the five star hotels against the quality of services offered.**

<table>
<thead>
<tr>
<th>Chi-Square Test</th>
<th>Value</th>
<th>Df</th>
<th>Asymp. Sig (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>47.421</td>
<td>25</td>
<td>.866</td>
</tr>
</tbody>
</table>

The chi-square value calculated here indicates the degree of consistency among the opinions presented against respective age groups. Here, the calculated value comes to 47.421 at degrees of freedom of 25, which is more than the table value (38 at 5%, 44.3 at 1%). This clearly shows that the null-hypothesis is rejected and the alternative hypothesis is accepted. In other words, there is a significant relationship between customers happiness with regard to price charged by the five star hotels for the quality of services offered.

**Correlation among the variables of reasons, awareness, services, offers and need for services:** To find the correlation among five different variables which are important to attain and retain customers. Those are:
- Reasons: Reasons for selection of the hotel by customers.
- Services: Services used by the customers during their stay.
- Awareness: Awareness on the special offers offered by the Star Hotels.
- Need for Services: Those services which are not provided by the hotel but needed by the customers.
- Offers: Different offers offered by the star hotels.

When the collected data are analyzed by using correlation for a sample size of 150(N), on 2 tailed basis, it is found that the correlation is at 5% (.05) significance level. To cross check the same on 1% which offers highest degree of accuracy, it is proved that there is again a perfect positive correlation among the above presented parameters.

As far as the reasons and services are concerned, the Pearson’s Correlation indicates negative at 0.167 and the same trend continued till awareness by -.064. This trend reversed when value added offers are provided along with the needed services by .038 and brought meaningful correlation between reasons, services, awareness, value added services and needed services. As far as the services to the customers based on the above sample size is analyzed, there is a perfect lower degree of correlation by 0.41, 0.02, 0.026 and 0.152 on the same parameters analyzed above. The services quality analyzed has proved that the correlations are positive but in very low degree which insists the improvement in services.

On third parameter awareness, the Pearson’s correlation is negative between awareness and reasons by 0.064, but turned to be positive between awareness to services and offers. However, there appears a spurious correlation on awareness part indicating no correlation. As far as the value added offers are concerned, correlation is positive with regard to reasons (0.038), services (0.182), awareness (0.220) and the needed services (.265). The last parameter needed services to strengthen the customer service quality yielded negative correlation in relation to its reasons by 0.081, in relation to services ’r’ is positive by 0.117, in relation to awareness ’r’ is positive by 0.223 and in relation to offers it is positive by 0.265. From the above analysis, it clearly revealed that there exists a degree of association between all the five parameters used for analysis. In one situation, the correlation transformed from negative to positive correlation, there by indicating improvement in service quality, value added services, awareness measure initiated and needed services visualized to implement by improving the quality of administrative decision making.
hotels need to be located in the prime areas of the city with easy access to services. Awareness of the need for services is significant at the 0.05 level (2-tailed).***

Table -7

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Pearson Correlation</th>
<th>Reasons</th>
<th>Services</th>
<th>Awareness</th>
<th>Offers</th>
<th>Need services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>-.167</td>
<td>-.167</td>
<td>-.064</td>
<td>-.081</td>
<td>.041</td>
<td>- .081</td>
</tr>
<tr>
<td>N</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

**SUGGESTIONS**

1. The existing customers who have experienced the facilities of a hotel, in turn, act as a ready reference to new customers. They share their experiences after they return from a trip, whether they are good or bad. Therefore, the hoteliers must take utmost care and cater to the needs and requirements of the existing customers.

2. In order to get an advantage of proximity, hotels need to be located in the prime areas of the city with easy access to shopping centers, sporting facilities, medical services etc., which are convenient to the customers. This helps the customer to reach the hotel and save their time without wasting in traﬃc and travelling. If the intended stay is for a holiday, then proximity to beaches, fun parks, tourist attractions and restaurants will play a critical role in decision making.

3. Hotels have to undergo remodeling to refresh the interiors of guest rooms and public spaces in order to remain competitive. From the study it is found that only 7 per cent of the customers were interested in ﬁve star hotels. This indicates that very less percentage of the customers were showing interest towards star hotels. Hoteliers should focus on this aspect immediately, and plan for diﬀerent CRM Strategies to attract the customers more to the ﬁve star hotels.

4. When the stay is comfortable with good food and recreation, the customers naturally get attracted to stay in. Hotels should provide wide range of food & beverages to cater to a variety of nationals and tourists. They should employ specialist chefs for each cuisine and set up large number of restaurants specializing in serving diﬀerent exotic cuisine.

5. Hotels should also provide recreation facilities like Spa, Golf Course, Gymnasium, Boating, Pools, Kids club, Movies, Indoor Games, Arts and Crafts, etc to attract more customers.

6. The hotel should ensure that the customer gets complete information on all services and products. Not only should the information be complete, but it should also be accurate. Constant feedback from guests has to be encouraged on the quality of their experience and the services oﬀered for any suggestions and improvement. Hotels have to practice transparency and accuracy in billing and ensure that customers beneﬁt and get full satisfaction for the price paid by them.

7. Understanding the expectations and requirements of customers is important for success in hospitality sector. For example, providing add-on services, giving high level personalized services; collecting feedback from existing customers regularly will ﬁll the gap between the expectations of customers and services provided by the hoteliers. Hotels that charge extra for internet access are perceived as taking advantage of guests, the numbers of places that oﬀer this service for free are more in the recent past. Hence hotels should ensure that they provide this service free of cost to the customers.

8. According to correlation test, the relationship between the five parameters of services, reasons, awareness, oﬀers and need for services, it is found that there exists a degree of association between all the five parameters used for analysis. This indicates that on an average customer dissatisfaction level is going down and the satisfaction level is proportionately increasing on the services of star hotels. Hence, it is suggested that the hoteliers are to increase the levels of satisfaction among customers. This can be possible only with the proper planning of the management and full co-operation from the staff. This result shows that the organization has lot of scope to introduce synergy in developing customer satisfaction.

**CONCLUSION**

This study indicates that most of the service firms lose more than 30 per cent of their customers mainly because of poor service. Market shares do not drop because competitors are usually in the same position and are losing customers to their rivals. Hotels need to be proactive to convert this particular percentage of the customers into satisfied customers. Another area where hotels have to pay more attention is for the price charged by them for the services. Developing close relationship with customers will be very helpful to decrease the level dissatisfaction among customers in all categories. This study gives information only from customers’ point of view. All these five star hotels are rich with a minimum of five years experience. During last ﬁve years there are few more five star hotels are established in Hyderabad city include: Vivanta, Westin, Park Hyderabad, Taj Falaknuma Palace.
REFERENCES


*****
Impact of MGNREGA on Rural Poor: A Case Study of Panchrukhi Block, District- Kangra, Himachal Pradesh

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\textsuperscript{b}Chankyapuri, Ghuggar, Palampur, District-Kangra, H.P(176061), India.

Abstract: Indian economy is growing at rapid pace but more than one fourth of rural population found to be below poverty line due to fluctuations in employment, shrinking employment opportunities, and low wage rates. Government of India (GoI) has been introducing a number of wage employment programmes. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is among one of them. The Indian Parliament has passed MGNREGA act in 2005, which came into force in February 2006. MGNREGA evidently indicate increase in employment opportunities, and market wage rates and reduction in distress migration in many parts of the country. This paper is an attempt to study the impact of MGNREGA on the life style of rural poor. The study is confined to 6 panchayats Shimbal khola, Tikker, Tatehal, Biara, Ladoh and Rajot of Panchrukhi block, District Kangra, H.P. The study is based on both primary and secondary data. The main findings of the study are most of the people think that MGNREGA is helpful in the development of the village, most of the people are not aware about the process and practices under MGNREGA Scheme, most of the people are not aware of how much money is coming from the block level and how much is used in the public works, most of the people think that the earning in terms of wages through MGNREGA is helping in the financial upliftment of the life styles of the people. As far as corruption is concerned in MNREGA people are almost of the same opinion. People are of the mixed opinion that corruption exists in MGNREGA as well as there is no point of corruption in MGNREGA.

Keywords: MGNREGA; rural poor; employment; wages; villages; corruption.

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1. INTRODUCTION

This Act came into force on February 2, 2006. The twin objectives of the Act are augmenting wage employment and strengthening natural resource management. As per the National Rural Employment Guarantee Act, job cards are issued to the rural unskilled labour by guaranteeing work for 100 days in a financial year at a minimum daily wage of Rs.138. It is the largest programme in the world for rural reconstruction. The scheme covered 604 districts in India in three phases and provided employment opportunities for more than 4.47 crore households in 2008-09. The total outlay for the scheme is $8 billion during 2009-10. NREGA creates transparency and accountability in governance. All NREGA beneficiaries now have accounts with banks or post offices. The scope of the programme is limited to unskilled manual labour. The scope can be extended through increased land productivity. Land productivity can be maximized through better convergence of NREGA with other programmes. Sustainable development is the ultimate goal of NREGA.

M.S. Swaminathan, Father of Green Revolution in India argues that there is a synergy between National Food Security Act and NREGA. NREGA through its diversified programmes on human development helps to ensure food security for all. It is the realisation of Gandhi's dream to make India self-sufficient. It was initially called the National Rural Employment Guarantee Act (NREGA) but was renamed on 2 October 2009. The scheme has now been renamed as Mahatma Gandhi Rural Employment Guarantee Act. Gandhi thought us how unskilled manual labour can be made use of for the betterment of society. This act was introduced with an aim of improving the purchasing power of the rural people, primarily semi or un-skilled work to people living in rural India, whether or not they are below the poverty line. Around one-third of the stipulated work force is women. The government is planning to open a call center, which upon becoming operational can be approached on the toll-free number, 1800-345-22-44.
HOW MNNREGA WORKS?

HOW CAN ONE APPLY FOR WORK - To get employment the registered adult holding a Job Card should ask for work through an application on a plain paper in writing to the Gram Panchayat or Programme Officer (at Block level) and ask for a dated receipt of application.

WHEN CAN ONE GET EMPLOYMENT - Within 15 days of submitting the application or from the day work is demanded, employment will be provided to the applicant.

WHO WILL ALLOT EMPLOYMENT - Gram Panchayat or the Programme Officer, whoever has been requested

HOW WILL ONE KNOW THAT HE HAS GIVEN EMPLOYMENT - Applicants are to be communicated where and when to report for work within 15 days, through a letter sent by the Gram Panchayat/Programme Officer. There will also be a public notice displayed on the notice board of the Gram Panchayat and at the office of the Programme Officer at the Block level, providing information on the place, date and the names of those provided employment. Wages are to be paid every week, or in any case ‘not later than a fortnight after the date on which such work was done’. A proportion of the wages in cash may be paid on a daily basis. Within 5 km of applicant’s residence. If employment is provided beyond 5 km radius of the applicant’s residence then he/she is entitled to 10% additional wages towards transport and living expenses. If some persons are directed for work beyond 5 kilometres, then persons older in age and women shall be given preference for work on worksites nearer to the village.

WHAT HAPPENS WHEN EMPLOYMENT IS NOT GIVEN TO ELIGIBLE PERSONS - If the eligible applicant does not get employment within 15 days of the demand for work or the date from which he sought work (date of submitting application), he shall be provided unemployment allowance as per terms and conditions laid down.

Allowance rate: The rate of unemployment allowance will be 25% of the wage rate for the first 30 days and 50% of the wage rate after that during the financial year subject to the household entitlements of days of employment.
<table>
<thead>
<tr>
<th>S.No</th>
<th>Panchayats</th>
<th>Spill Over Works</th>
<th>Work Take Up In Current Year</th>
<th>Work Completed In Current Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>from Fin. Year 2009-2010 and earlier</td>
<td>from Fin. Year 2010-2011</td>
<td>from Fin. Year 2011-2012</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>AGOJAR</td>
<td>2</td>
<td>2</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>ANDRETA</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>BADEHAR</td>
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<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>BANOORI KHAS</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
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<td>1</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>BHIRDI</td>
<td>1</td>
<td>9</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>BHUANA</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
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<td>1</td>
<td>2</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>9</td>
<td>BIYADA</td>
<td>0</td>
<td>0</td>
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<td>4</td>
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<td>1</td>
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<td>4</td>
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</tr>
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<td>3</td>
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<td>3</td>
<td>1</td>
<td>6</td>
<td>10</td>
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<tr>
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<td>KAILASHPUR</td>
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<td>7</td>
<td>21</td>
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<tr>
<td>17</td>
<td>LADH</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>11</td>
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<tr>
<td>18</td>
<td>MAKOL</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>MOLI CHAK</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
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<td>MUHAL BANOORI</td>
<td>3</td>
<td>12</td>
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<td>MUHAL HOLTA</td>
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<td>0</td>
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<tr>
<td>22</td>
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<td>3</td>
<td>0</td>
<td>4</td>
<td>7</td>
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<td>10</td>
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<tr>
<td>25</td>
<td>RAJPUR</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>18</td>
</tr>
<tr>
<td>26</td>
<td>RAKKER BHERI</td>
<td>0</td>
<td>1</td>
<td>5</td>
<td>6</td>
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<tr>
<td>27</td>
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<td>0</td>
<td>1</td>
<td>4</td>
<td>5</td>
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<tr>
<td>28</td>
<td>SULAYANA</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>29</td>
<td>SIMBEL</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>30</td>
<td>SIMBEL KHALA</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>31</td>
<td>SUNGAL</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>32</td>
<td>TANDA</td>
<td>11</td>
<td>21</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>33</td>
<td>TAREHAL TATEHAIL</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>34</td>
<td>TIKKER KHAS</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>35</td>
<td>VAND VIHAR</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>95</td>
<td>89</td>
<td>264</td>
<td>448</td>
</tr>
</tbody>
</table>

Progress of Work Execution of Panchrukhi block in Financial year 2012-2013.
2. REVIEW OF LITERATURE – A number of literature based on empirical studies are available on the role of MGNREGA in achieving livelihood security and promoting sustainable development. These studies depict that MGNREGA programme has shown mixed results so far in whole rural area.

Dattar 1987 found that employment guarantee scheme supplies core income to many women and that this economic power accorded them higher status within the family. Concentrating a large number of women in one place can increase interaction, break down social taboos, expand social awareness and instil confidence in women.

Wage: - Many research works have done on wage system in MGNREGA scheme like (Anindita et.al 2010), (Anish Vanaik et.al 2008), (CAG 2008), (Siddhartha et al 2008), (Kidambi somya). MGNREGA has a demand driven Scheme so under this scheme part of funds 60% expended on wages but due to irregularities in some cases work has been completed but wages have not been given to beneficiaries. Payments of wages through bank are another safe guard of this scheme but due to corruption and irregularities wage has been not received by beneficiaries.

Hirway et al. (2006) finds that there is limited success towards the implementation of the scheme. Ghuman et al. (2008) says that the achievement of the Act in terms of annual average days of employment per household has been nearly 1/4th of the minimum 100 days employment.

Joshi et al. (2008), the impact of the study reveals that people at large are satisfied with the scheme. Ministry of Rural Development (2008) opines that the monitoring and implementation of MGNREGA has problem in many states. RTBI (2009) the program remained true to its ‘right to work’ entailments and did not counsel households that approached for works with better living standards.

3. OBJECTIVES OF THE STUDY - The paper is attempted with main objectives to study the impact of MGNREGA in society.
   1. To study the impact of MGNREGA on the life style of rural poor.
   2. To study what people feel about usage of funds provided to their panchayats or blocks.
   3. To know about that MGNREGA is helpful in development of village or not.
   4. To study about the perception of people regarding corruption in MGNREGA.

4. NEED OF STUDY - As MGNREGA is among one of the top most employment generating schemes in India and a lot of money is involved in this for the benefit of the poor that is why it becomes very important to know about the proper functioning of the scheme so that the corruption and such things can be avoided and the people should get maximum benefit out of it. So, the study of the topic is very important and highly needful.

5. RESEARCH METHODOLOGY – The study is conducted in 6 panchayats Shimal khola, Tikker, Tatehal, Biara, Ladoh and Rajot of Panchrukhi block, District Kangra, H.P. The study is based on both primary and secondary data. The primary data is collected through set of 100questionnaire’s and secondary data is collected through published books and reports. The primary data as per the requirement of the objectives of the study has been analysed with appropriate methodology.

6 RESULTS/INTERPRETATION OF DATA-
6.1. Since when you have been employed under MGNREGA.

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>One month</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>13</td>
<td>19</td>
<td>8</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

INTERPRETATION- It is found that 60% respondents are working under MGNREGA since 2009, 13% respondents working since 2010, 19% since 2011, 8% respondents working since last one month.

![Figure 1.1](image-url)
6.2. Are you aware of the processes and practices of MGNREGA?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16</td>
<td>84</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1.2

**INTERPRETATION**- In this pie chart it is very much clear that 16% respondents are aware about process & practices of MGNREGA and 84% are unaware.

6.3. Do you have the following facilities available at the work site?

<table>
<thead>
<tr>
<th></th>
<th>Shed</th>
<th>First aid-kit</th>
<th>Water</th>
<th>Child care</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>93</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1.3

**INTERPRETATION**- In this pie chart it is very much clear that 4% respondents said they have shed facilities, 1% respondents agreed for first aid-kit, 2% respondents agreed for drinking water, 92% respondents said they don’t have any of the above said facilities.

6.4. Do you think wage from MGNREGA has added sufficiently to your family?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>76</td>
<td>24</td>
<td>100</td>
</tr>
</tbody>
</table>
INTERPRETATION - In this pie chart it is very much clear that 76% respondents feel that MGNREGA wages have added sufficient to their family.

6.5. Do you feel that in the last two year or less you have been able to enhance your ability to purchase or own any new asset in your family?

Table 1.5

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Don’t want to reveal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>20</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

INTERPRETATION - In this chart it is clear that 73% respondents have been able to enhance their purchasing power in last two years.

6.6. Whether you feel comfortable in having sufficient food after working in MGNREGA?

Table 1.6

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>81</td>
<td>19</td>
<td>100</td>
</tr>
</tbody>
</table>
6.6. Are you able to spend more on your children’s education after working in MGNREGA?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>53</td>
<td>100</td>
</tr>
</tbody>
</table>

**INTERPRETATION** - In this pie chart it is very much clear that 53% respondents are not able to spend more money on children’s education.

6.7. Do you feel MGNREGA is helpful in the development of village?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>91</td>
<td>9</td>
<td>100</td>
</tr>
</tbody>
</table>

**INTERPRETATION** - In this pie chart it is very much clear that 91% respondents feel that MGNREGA is helpful in the development of village.

6.8. Rank the development of village before MGNREGA?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>yes</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>no</td>
<td>9%</td>
</tr>
</tbody>
</table>

**INTERPRETATION** - In this pie chart it is very much clear that 81% respondents having sufficient food after working in MGNREGA.

6.9. Rank the development of village before MGNREGA?
INTERPRETATION- In this pie chart it is very much clear that 66% respondents feel that the development of village after MGNREGA is high.

6.10. Do you think funds are actually spent on the actual reason or just being shown a cause just to get funds and the cause never really existed?

INTERPRETATION- In this pie chart it is very much clear that 84% respondents feel that funds are actually spent on the cause being shown.

6.11. Do you feel that there is corruption in MGNREGA?

Table 1.9

<table>
<thead>
<tr>
<th>High</th>
<th>Low</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>29</td>
<td>5</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1.9

Table 1.10

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>16</td>
<td>100</td>
</tr>
</tbody>
</table>

Figure 1.10

Table 1.11

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>57</td>
<td>100</td>
</tr>
</tbody>
</table>
6.12. Do you think that MGNREGA scheme should be continued in the days to come?

Table 1.12

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>92</td>
<td>8</td>
<td>100</td>
</tr>
</tbody>
</table>

7. FINDINGS OF THE STUDY-
- Most of the People were employed from 2009 under MGNREGA Scheme.
- Most of the people think that MGNREGA is helpful in the development of the village.
- Majority of people feel that there is no corruption in MGNREGA Scheme.
- Most of the people are not aware about the process and practices of MGNREGA Scheme.
- Most of the people are not aware of how much money coming from the block and how much is spent.
- Most of the people think that wage from MGNREGA is added sufficiently to their family.
- Most of the people think that MGNREGA scheme should be continued in the days to come.

8. CONCLUSION - This study on MGNREGA Scheme is done to know the process and practice used in MGNREGA Scheme.
- During study it is found that basic required facilities are not available at the work site.
- Most of the people feel that corruption prevails in MGNREGA scheme.
- If proper measures are taken this scheme will do more in future.
9. RECOMMENDATIONS AND SUGGESTIONS- For the proper functioning of the scheme following Recommendations and Suggesions are there:

- Arrangements should be made to make proper check on working of the scheme
- Suitable Basic facilities should be provided to the workers.
- To create awareness among the people connected with scheme.
- Provisions are made for the transparency of the scheme.
- Vocational trainings should be provided to needed persons.

10. REFERENCES/SITES-


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Use of Linear Programming Model to Determine the Optimum Cropping Pattern for an Irrigation Scheme in Masvingo, Zimbabwe


ABSTRACT: Agricultural systems are often faced by challenges such as crop selection and irrigation planning which can be formulated as optimization problems. Decisions have to be made on the proper set of crops to be cultivated and a proper irrigation scheme. The objectives of such decisions are to maximize net profit or to minimize water waste. In this study, a linear programming model was developed that helped to determine the optimal cropping pattern for an irrigation scheme in Masvingo, Zimbabwe. Crops which considered were wheat, sugar beans for winter and cotton and maize for summer for the 2012/13 agricultural season. The linear programming model was solved by using Microsoft Excel (2007). The model recommended no production of wheat and cotton. Sugar beans and maize gained acreage by 50 percent and 88 percent respectively. On the whole, the optimal cropped acreage did not change as compared to the existing cropping plan. As a result of the optimal solution, a farmer’s income could be increased by $1,668.60. The optimal income increased from existing level of $1,919.40 to $3,588.00 showing an improvement of 87 percent. The results show that LP models solutions are worthy implementing.

Keywords: Linear Programming; Cropping Pattern; Irrigation; Income; Masvingo

1. INTRODUCTION

Agricultural systems are often faced by challenges such as crop selection and irrigation planning which can be formulated as optimization problems (Gomaa, Harraz, & ElTawil, 2011). Decisions have to be made on the proper set of crops to be cultivated and a proper irrigation scheme (Gomaa, Harraz, & ElTawil, 2011). The objectives of such decisions are to maximize net profit or to minimize water waste (Gomaa, Harraz, & ElTawil, 2011). The linear programming (LP) technique has been used extensively in solving irrigation management problems (Gomaa, Harraz, & ElTawil, 2011). Jabeen, Ashfaq & Baig (2006) estimated the marginal value of irrigation water through LP technique. Linear programming models were developed to estimate the short run marginal value of water and predict the impact of different water supply scenarios on cropping pattern, cropping intensity and net income of the farms under study (Jabeen, Ashfaq, & Baig, 2006). Jabeen, Ashfaq & Baig (2006) say, “Results revealed that scarcity of water adversely affects the cropping intensity and net income of representative farms”. Hassan, Raza, Khan & Ilahi (2005) applied an LP model to calculate the crop acreage, production and income of the Dera Ghazi Khan Division of Punjab province. The study was carried on irrigated areas from the four districts. Crops which were included in the study were wheat, rice, cotton and sugar cane. Cotton gained acreage by 10 percent. Income increased by 2.91 percent as compared to the existing situations.

Karamouz, Ahmadi & Nazif (2009) developed a model to optimize a water resources allocation scheme considering the conjunctive use of surface water and groundwater resources, as well as determining a suitable crop pattern. A genetic algorithm was used to solve the optimization model. The proposed model was successfully applied to the Varamin plain to determine the optimal crop mix and water allocation from surface and groundwater. A study was carried out in Nigeria in Kogi State to examine the impact of small scale irrigation technology in crop production under Fadama areas. The LP analysis revealed that opportunities exist for increasing profit through resources re-organization (Ohikere & Ejeh, 2012). Alminnana, Escudero, Landete, Monge & Sanchez-Soriano (2008) developed mixed 0-1 a separable nonlinear program for irrigation scheduling. These are being used as a decision support system tool to determine water irrigation scheduling by The Agriculture Community of Elche (ACE), Elche a city in the southeast of Spain. In a research conducted in Mpumalanga, South Africa, an LP model capable of economically evaluating a farm expansion decision making process for farmers faced with investment decisions was established (Haile, Grove, & Oosthuizen, 2003). An LP model was successfully used to assign a mainline for a total of twelve irrigation system combinations based on the assumption that the farmer wishes to start with a 30 ha centre-pivot investment (Haile, Grove, & Oosthuizen, 2003).

The economic value of irrigation water used in a crop farm (paddy and chillies) was successfully estimated using an LP approach in the Senanyake Samudra (Gol-Oya Irrigation Scheme) Right Bank System area in the Ampara District (Sivarajah & Ahamad, 2010). Budiasa (2011) developed a Sustainable Irrigated Farming System (SIFS) Model at the household level in the north coastal plain, Bali. Primary data from farmers were used to specify parameters of the model. Linear programming technique was used to solve the problem. Raju, Kumar & Duckstein (2006) in their study had an objective to select the best compromise irrigation planning strategy for the case study of Jayakwadi irrigation project, Maharashtra, India. They employed a four-phase methodology to solve the problem. In phase 1, separate LP models were formulated for the three objectives, that is, net economic benefits, agricultural production and labor employment. Tzimopoulos, Balioti, Evangelides & Yannopoulos (2011) determined optimal cropping patterns in the territory of...
Agios Athanasios irrigation network, Greece by the proposed method based on an LP model. Their results showed that the proposed LP model gives the optimum crop pattern for the region, obtaining the highest profit.

The objective of this study was to develop the optimal cropping pattern for an irrigation scheme in Masvingo, Zimbabwe, and to assess the farmers’ income level under optimal cropping pattern and its comparison with the existing income level.

2. THE LINEAR PROGRAMMING FORMULATION
The study area selected for this is an irrigation scheme in Masvingo, Zimbabwe. The irrigation scheme, 624 hectares in extent, is located 20 kilometers south of Masvingo town (Ndamba, Sakupwanya, Makadho, & Manamike, 1999). The scheme lies in agro-ecological zone IV, which receives an annual rainfall of about 650 mm per year (Ndamba, Sakupwanya, Makadho, & Manamike, 1999). The scheme is supplied by water from a 25 kilometer canal, of which 17 kilometers are concrete-lined and 8 kilometers are unlined (Ndamba, Sakupwanya, Makadho, & Manamike, 1999). (Ndamba, Sakupwanya, Makadho, & Manamike, 1999) say, “The average plot holding per family is 1.5 hectares. The irrigators at this scheme utilize rotational water supply to each irrigation block. Their major crops are cotton and grain maize in summer and wheat and beans in winter. A block consists of the same crop and is partitioned to accommodate every irrigator. This system is called block irrigation”. Water from the dam has been used to irrigate crops such as cotton, wheat, sugar beans, soya beans, paprika, maize, tomatoes and cabbages (Gwazani, et al., 2012).

An LP model was developed to arrive at an optimal plan of production for a typical farmer at the irrigation scheme. The objective of the LP model was to maximize the total net income subject to resource constraints. The LP model patterns after the model by Bamiro, Afolabi and Daramola (2012). The objective function is given by:

$$ Z = \sum_{j=1}^{n} c_j X_j $$

Subject to

$$ \sum_{i=1}^{m} a_{ij} X_j \leq b_i, $$

$$ X_j \geq 0 $$

where,

$Z = $ Total annual net returns,
$m = $ Number of resources,
$n = $ Number of activities,
$C_j = $ Net returns per unit of jth activity,
$X_j = $ Level of the jth activity,
$bi = $ Amount of the ith resource required,
$aij = $ Amount of the ith resource required per unit of the jth activity.

3. RESULTS AND DISCUSSION
The linear programming model was solved by using Microsoft Excel (2007). The optimal cropping pattern resulting from the LP model for a single farmer in comparison to the existing cropping pattern are presented in Table 1 for the 2012/13 agricultural season. It was noted that sugar beans and maize gained acreage by 50 percent and 88 percent respectively. The LP recommended no production of wheat and cotton. On the whole, the optimal cropped acreage did not change as compared to the existing cropping plan.

Table 1. Cropping Patterns

<table>
<thead>
<tr>
<th>Crops</th>
<th>Existing (ha)</th>
<th>Optimal solution (ha)</th>
<th>% of existing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Winter:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>0.5</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Sugar beans</td>
<td>1.0</td>
<td>1.5</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.5</td>
<td>1.5</td>
<td>100</td>
</tr>
<tr>
<td><strong>Summer:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>0.7</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Maize</td>
<td>0.8</td>
<td>1.5</td>
<td>188</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1.5</td>
<td>1.5</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Income Levels

<table>
<thead>
<tr>
<th></th>
<th>Existing Income ($)</th>
<th>Optimal solution ($)</th>
<th>% of existing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Winter:</strong></td>
<td>$1,919.40</td>
<td>$3,588.00</td>
<td>187</td>
</tr>
</tbody>
</table>

As a result of the optimal solution, a farmer’s income could be increased by $1,668.60. The optimal income increased from existing level of $1,919.40 to $3,588.00 showing an improvement of 87 percent. The results show that LP models solutions are worthy implementing. Optimal cropping patterns increase income.
4. CONCLUSION
In this study, a linear programming model was developed that helped to determine the optimal cropping pattern for an irrigation scheme in Masvingo, Zimbabwe. Crops which considered were wheat, sugar beans for winter and cotton and maize for summer. The farm income could be increased by 87 percent if the optimal cropping was applied.

5. REFERENCES

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TREND ANALYSIS OF NIGERIAN RICE SUB-SECTOR INDICES: LESSONS FOR RICE SELF SUFFICIENCY IN NIGERIA

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ABSTRACT: This study was undertaken to empirically examine the trends of rice consumption, rice production, rice import and rice area harvested in Nigeria over the period of 1960 to 2011 with the special interest on drawing up lessons for achieving rice self sufficiency in Nigeria. Secondary data were employed in this study and were analysed using descriptive statistics notably graphical analysis. It was noted that rice consumption is growing faster than rice production in Nigeria and therefore, the growing trend of rice importation to meet local demand will incessantly continue leading to a steady loss of revenue in importing rice. It was recommended that adequate policies aimed at boosting rice production through increase in rice productivity other than just the expansion of rice area harvested should be embraced by all the stakeholders in the Nigerian rice subsector so as to achieve rice self sufficiency in line with the agricultural transformation agenda of Nigeria.

Keywords: Trend; Rice; Consumption; Production; Import; Area harvested

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1. INTRODUCTION

Nigeria currently doubles as the largest rice producing nation in West African sub-region and the second largest importer of rice in the world, this anomaly is attributed to the inability of its local production to meet up with its demand which has been soaring at a very fast rate over the years. Nigeria’s rice consumption is projected to reach 35 million tonnes by 2050 from five million tonnes currently, rising at the rate of 7 per cent yearly due to population growth [1].

Nigeria is the largest consumer of rice in the West African region and its demand for rice has been soaring at a very fast rate over the years [2]. A combination of various factors seems have triggered the increase in the demand for rice. According to [3] rising demand was partly the result of increasing population growth. Also, increased income level following the discovery of crude oil in Nigeria led to a rise in demand for the commodity. The most important factor contributing to the shift in consumer preference away from traditional staple and toward rice is rapid urbanization and associated changes in family occupational structure. Statistics from a rice consumption survey in 2003 showed that people in large cities like Lagos, Abuja and Makurdi (per capita consumption of 64, 64 and 72 kg/annum) consume significantly more rice than people in the rural areas, and the vast majority of the rice consumed in cities is imported [4]. As women enter the work force, the opportunity cost of their time increases and convenience food such as rice which can be prepared easily rise in importance. Similarly as men work at greater distances away from their homes in urban setting, more meals are consumed from the market where the ease of rice preparation has given it a distinct advantage. These trends have meant that rice is no longer a luxury food in Nigeria but has become a major source of calories for the urban poor [5].

In a bid to address the demand-supply gap of rice in Nigeria, government have at various times come up with policies and programmes such as the Federal Rice Research Station (FRRS), established in 1970; National Accelerated Food Production Project (NAFPP), established in 1972; the National Cereals Research Institute (NARI), launched in 1974; World Bank-Assisted Development Programs, set up in 1975; Operation Feed the Nation (OFN), started in 1976; the River Basin Development Authorities (RBDs), established in 1977; and Abakaliki Rice Project (ARP), established in 1978 and in recent times, the Presidential Initiative on Rice (PIR), established in 1999; the National Program for Food Security (NPFS); the first phase of which was launched in 2001 and the National Rice Development Committee (NRDC). It is observed that these policies have not been consistent. The fluctuations in policy and the limited capacity of the Nigerian rice sector to match domestic demand have raised a number of pertinent questions both in policy circles and among researchers [6].

The Nigerian rice sector has witnessed some remarkable developments, particularly in the last ten years. Both rice production and consumption in Nigeria have vastly increased during the aforementioned period [7]. However, the demand for rice has continued to outstrip production given the shift in consumption preference for rice especially by urban dwellers. Therefore, rice has become a strategic commodity in the Nigerian economy and has continued to attract the attention of all tiers of government, non-governmental agencies, policy makers, researchers and other stakeholders in the rice industry in an effort to address the widening demand-supply gap situation of rice in Nigeria. In view of the foregoing, it has become imperative to examine the trends in the indices (rice consumption, production, import and area harvested) of the Nigerian rice sub-sector over the years so as to be able to make relevant inferences for attaining rice self sufficiency in Nigeria.
2. METHODOLOGY

2.1 OVERVIEW OF STUDY AREA

The study area is Nigeria. Nigeria is a vast agricultural country “endowed with substantial natural resources” which include: 68 million hectares of arable land; fresh water resources covering about 12 million hectares, 960 kilometres of coastline and an ecological diversity which enables the country to produce a wide variety of crops and livestock, forestry and fisheries products [8]. The country lies between 4°N and 14°N, and between 3°E and 15°E. Nigeria is located within the tropics and therefore experiences high temperatures throughout the year. The mean for the country is 27°C. Average maximum temperatures vary from 32°C along the coast to 41°C in the far north, while mean minimum figures range from 21°C in the coast to under 13°C in the north. The climate of the country varies from a very wet coastal area with annual rainfall greater than 3,500 mm to the Sahel region in the north western and north eastern parts, with annual rain fall less than 600mm.

![Figure 1: Map of Nigeria Showing Vegetation Zones](image)
Source: [9]

2.2 Data Collection and Sources

Secondary data on the indices of Nigerian rice sub-sector namely rice consumption in metric tonnes (MT), rice production in metric tonnes (MT), rice import in metric tonnes (MT) and rice area harvested in hectares (HA) were utilized in this study. The data utilized extended over a period of fifty two years (1960 – 2011). The data were collection from United States Department of Agriculture Foreign Agricultural Services (USDA FAS) database of production, supply and distribution [10].

2.3 Analytical Procedure

Descriptive statistics such as mean, median, skewness, kurtosis and graphical analysis was employed in the analysis of the data in this study. Eview 7.2 was the statistical package utilized to perform the descriptive statistics.

3. RESULTS AND DISCUSSION

4. 3.1 SUMMARY OF DESCRIPTIVE STATISTICS

The summary of some important descriptive statistics of the Nigerian rice sub-sector are presented in Table 1. Rice consumption index has a mean of 1756712MT, positively skewed, platykurtic and its errors are not normally distributed based on the Jarquebera statistic (4.887051), rice production index has a mean of 1136019MT, positively skewed, platykurtic with a Jarquebera statistic of 5.577622 indicating that the residuals are not normally distributed. Rice import index has a mean of 631019.3 HA, positively skewed, mesokurtic but not normally distributed. The area harvested of rice has a mean 1113.154, positively skewed, platykurtic and also not normally distributed.
Table 1: Descriptive Statistics of Nigerian Rice Subsector Indices

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Consumption (MT)</th>
<th>Production (MT)</th>
<th>Import (MT)</th>
<th>Area Harvested (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1756712</td>
<td>1136019</td>
<td>631019.3</td>
<td>1113.154</td>
</tr>
<tr>
<td>Median</td>
<td>1293000</td>
<td>664000</td>
<td>388000</td>
<td>690.000</td>
</tr>
<tr>
<td>Maximum</td>
<td>4970000</td>
<td>2700000</td>
<td>2300000</td>
<td>2451.000</td>
</tr>
<tr>
<td>Minimum</td>
<td>204000</td>
<td>202000</td>
<td>1000</td>
<td>179.000</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1451602</td>
<td>845472.4</td>
<td>686544.3</td>
<td>863.1256</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.625815</td>
<td>0.336210</td>
<td>0.967424</td>
<td>0.304007</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>2.169950</td>
<td>1.543244</td>
<td>2.712221</td>
<td>1.378290</td>
</tr>
<tr>
<td>Jarque – Bera</td>
<td>4.887051</td>
<td>5.577622</td>
<td>8.290642</td>
<td>6.499191</td>
</tr>
<tr>
<td>Probability</td>
<td>0.086854</td>
<td>0.061494</td>
<td>0.015838</td>
<td>0.038790</td>
</tr>
<tr>
<td>Sum</td>
<td>91349000</td>
<td>59073000</td>
<td>32813001</td>
<td>57884</td>
</tr>
<tr>
<td>Observations</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
</tbody>
</table>

Source: Authors Computation

3.2 ANALYSES OF TRENDS

The trend in milled rice consumption presented in Figure 2 shows that milled rice consumption has increased significantly over the years from 240 metric tonnes in 1960 to 850 metric tonnes in 1980 and 2757 metric tonnes in 1990 to 4970 metric tonnes in 2010 and this attributed to consumers preference for rice over other food items. However, the consumer preference for rice is largely for imported rice. As noted by [11], rice preference studies indicated that most Nigerians prefer imported rice which has mainly long and slender grains because of its ease of preparing rice recipes, cleanliness and acceptable odour as opposed to some local rice varieties which contain dirt, grits and sometimes foul odour and to improve the consumer acceptance of Nigerian rice, emphasis should be placed on good processing methods. The inability of domestic production of rice to keep pace with the increase in rice consumption over the years has resulted into a demand-supply gap for milled rice in Nigeria. In order to meet the increasing demand for milled rice, Nigeria has had to resort to importation of milled rice which has increased from 1000 metric tonne in 1960 to 394000 metric tonnes in 1980 and 2300000 metric tonnes in 2010 as shown in Figure 4. This continual dependence on rice importation in meeting the domestic demand for milled rice has constituted a great drain in the foreign exchange earnings as the country spends well over 300 billion naira in the importation of rice to meet local demand.

Although there has been an increase in rice production over the years as shown in Figure 3, it has not kept with the growing trend of rice demand in Nigeria. It is worth noting that the increase in rice production over the years is largely attributed to expansion of land area harvested other than the increase in rice yield. Therefore, area extensification as shown in Figure 5 is largely contributed to the increasing trend of rice production other than the increase of rice productivity in Nigeria. This call for designing appropriate polices for achieving increase in rice productivity so as to meet local demand and produce surplus for export. As noted by [12], locally produced rice has the potential to meet food (especially rice) demand of consumers in Nigeria if efficient production practices are employed.

![Figure 2: Trend of Rice Consumption in Nigeria](image-url)
Figure 3: Trend of Rice Production in Nigeria

Figure 4: Trend of Rice Import in Nigeria

Figure 5: Trend of Rice Area Harvested in Nigeria
LESSONS FOR RICE SELF SUFFICIENCY IN NIGERIA

It has been established that rice consumption is growing faster than rice production in Nigeria and therefore, the growing trend of rice importation to meet local demand will continue to soar if appropriate measures are not put in place to halt this unpalatable scenario in Nigeria. The drive to achieve rice self sufficiency and even produce surplus for export is realizable. One viable option is to pursue policies aimed at rapidly increasing rice production through increase in rice productivity other than just the expansion of rice area harvested. This requires the availability of improved rice varieties for cultivation by farmers, effective extension service delivery, adequate tariff regime to discourage rice importation, availability of improved facilities for rice processing among other relevant measures.

4. CONCLUSION AND RECOMMENDATION

This study examined the trends of the basic economic indices of the rice sub-sector in Nigeria using secondary dataset. Graphical analysis was principally used to show the trends of the indices(rice consumption, rice production, rice import and rice area harvested). It was observed that rice production have increased over the years but the increase have not been able to match the trend of rice consumption and this have continued to spur the need for rice importation to meet local demand. This continuous trend of rice importation is an unhealthy practice for the economy as the country continues to lose foreign exchange. It is recommended that adequate policies aimed at boosting rice production through increase in rice productivity other than just the expansion of rice area harvested should be embraced by all the stakeholders in the Nigerian rice subsector so as to achieve rice self sufficiency.

5. REFERENCES


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SOCIOECONOMIC ANALYSIS OF THE FOOD SECURITY STATUS OF MAIZE FARMING HOUSEHOLDS IN GIWA LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

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Abstract: This study specifically examined the food security status of the maize farming households, their perception on the contribution of maize farming to their households food security status and the determinants of the food security status of the maize farming households in the study area. Primary data collected from a sample size of 100 maize farming households were employed in the study and the data were analysed using descriptive statistics, food security index and logit regression. The result showed that 54% of the maize farming households was food secure while 46% were food insecure. The maize farming households perceived maize farming to be important in contributing to their household food security. The factors significant in influencing food security in the study area were household size, household income, farming experience, association, extension, education and farm size. It was recommended that farmers should adopt proper maize farming management practices aimed at high intensity of maize production which will serve as maize production offers an opportunity for increasing household food security.

Keywords: Food security, Households, Maize, Perception

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1. Introduction
One of the greatest problems facing developing country today is the production of sufficient food for their large population. It is a widely accepted fact that food is a basic necessity of life [1]. Its importance at the household level is obvious since it is a basic means of sustenance. Food security has posed some challenges to human welfare and economic growth in Nigeria [2]. Low food availability and profound poverty have caused a number of undernourished people in the continent to rise considerably in recent years [2]. Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food which meet their dietary needs and food preferences for an active and healthy life [3]. There are four major elements that constitute food security. These are availability, adequacy, accessibility, and sustainability of access. Availability connotes the physical presence of food in large amount. Accessibility suggests sufficient purchasing power or ability to acquire quality food at all time while utilization demands sufficient quantity of food intake [4]. The elements of availability, accessibility, utilization and sustainability in a larger context embrace the supply, demand and adequacy of food at all times [4].

Agricultural growth is particularly effective in reducing hunger and malnutrition [3]. The Agricultural growth rate relative to population growth is said to be low in Nigeria [5]. Agriculture is reported to grow at a rate of 2.5% per annum as at against 3.5% per annum of population growth rate, thus resulting to food insecurity in the nation [6]. A number of factors such as climatic changes, soil fertility and variability, and lastly population explosions are examples of some factors that can lead to foods security constraints. These fluctuations in weather patterns pose serious threat to mankind and its environs and may have overall adverse effect on food security issues [7].

Food crops such as rice, maize, cowpea, melon, groundnut, cassava, sweet potatoes, millet, sorghum, etc. are crops that contribute to food security to meet the consumption needs of the households, and as a source for livestock feeds. Its production is therefore important in meeting the food need of the poor rural households in particular and Nigeria in general [8]. Maize is one of the important sources of food supply to many people all over the world. Maize is an important food and feed crop in Nigeria and remains an important crop for rural food security [9]. Maize has huge lucrative potentials for food security [10]. Maize has now risen to a commercial crop on which agro based industries depend on as raw materials [11].

Food insecurity is a major development problem that is caused by myriad of factors in the global, regional, national and local spheres of human life. Several efforts have been put in place to alleviate food insecurity globally, nationally and even locally [12]. Despite these efforts the situation continues to prevail and sometimes increase in the contemporary human society because there exist little empirical knowledge on the analysis of food security status. It is therefore imperative that food insecurity gets addressed appropriately. Small scale farmers play a vital role in food production especially through subsistent farming. However, their households are major causalities of food insecurity despite their effort in food production [12]. Therefore, this study was designed to contribute to existing literature on food security status especially among maize farming households in Giwa Local Government Area of Kaduna State. The study specifically examined the food security status of the maize farming households, the perception of maize farming households on the contribution of maize farming to their households food security status and the determinants of the food security status of the maize farming households in the study area.
2. Methodology

2.1 Description of the Study Area
The study was conducted in Giwa Local Government Area of Kaduna State, Nigeria. The local government lies between latitude 11.20° N and longitude 7.0° E. It is located North-West of Zaria in the transition zone between Northern Guinea Savannah and southern tip of Sudan Savannah and about 640m above sea level. The local government is bounded on the north by Funtua and Malumfashi Local Government Areas of Kastina State and on the west and south by BirninGwari and Igbabi Local Government Areas of Kaduna State respectively. Giwa Local Government has an estimated population of 350,586. The population growth rate is 4%. The total rural population in maize production is 171,856 and about 70% of the households in Giwa Local Government produce maize annually. The percentage of rural population is 60%. The average household size is 7 members and the average farm size per household is 2.5 hectares. The local government has eleven (11) districts and eleven (11) wards. These wards include Kadage, Gangara, Galadimawa, Danmahawayi, Shika, Giwa, Kidandan, Kankangi, Panhauya, Idasu and Yakawada. The wards include: Karaukarau, Gangara, Fatika, Danmahawayi, Shika, Giwa, Kidandan, Kankangi, Tsibiri, Kaya and Yakawada.

2.2 Sampling Procedure and Sample Size
A combination of purposive and random sampling technique was used for this study. Giwa Local Government area will be purposively selected since it is one of the Local Government in Kaduna state that is known for high intensity of maize production relative to other local government areas in the state. Five districts of the eleven districts in Giwa Local Government Area where the cultivation of maize is high were randomly selected. These districts are Giwa, Shika, Kaya, Fatika, and Karaukarau. The household heads were used as sampling units. Twenty (20) farming household were selected from each district randomly. Therefore the total number of maize farming households that was used for this study was hundred (100) because there was no reliable sampling frame of maize farming households in the study area.

2.3 Method of Data Collection
The study used both primary and secondary data. The primary data were collected through the administration of structured questionnaire. To facilitate the collection of these data, the services of an extension agent was engaged. The information collected include farmers’ socio-economic characteristics such as age, gender, marital status, educational qualification, farming experience, contact with extension staff, cooperative participation, farm size, household size and access to credit, farmers’ food consumption and expenditure. The secondary data on the other hand was sourced using journals, bulletins, internets, past projects and the library.

2.4 Analytical Technique
The analytical tools used for achieving the objectives of this study include descriptive statistics, food security index and logit regression.

2.4.1 Food Security Index
Food security indexas used by[13] was used to measure the food security status of the maize farming households. This was used to classify the maize farming households into food secure or food insecure depending on their ability to meet the recommended daily per capita intake of 2260 kilo calorie [14].

The food security index was given as:

\[ Z_i = \frac{Y_i}{R} \]  

(1)

Where:  
- \( Z_i \) = food security of maize farming households  
- \( Y_i \) = daily per capita calorie intake of maize farming households  
- \( R \) = recommended per capita daily calorie intake (2260 kilo calorie)  
- \( Z_i = 1 \) for \( Y_i \) greater than or equal to \( R \)  
- \( Z_i = 0 \) for \( Y_i \) less than \( R \)

The degree of food security/insecurity was estimated using the equation given as:

\[ P_\alpha = \frac{1}{n} \left( \sum_{i=1}^{n} G_i \right) = \frac{1}{n} \left( \sum_{i=1}^{n} \frac{Y_i - Z}{Z} \right)^2 \]  

(2)

Where \( P_\alpha \) is degree of food insecurity for \( \alpha \) taking values of 1, 2 and 3 for headcount, short-fall and severity of food insecurity, \( n \) is the number of food insecure households, \( G_i \) is the per capita calorie intake deficiency of the \( i^{th} \) household.

2.4.2 Logit Regression Model
Logit regression model was used to achieve objective ii. The probability of a farmer being food secure was determined by an underlying response variable that captured the true economic status of the farmers. The underlying variable \( y \) in the case of the food security status of the maize farming households is expressed as follows:
\[ y = a + \sum_{i=1}^{7} x_i \beta_i + \mu \] \tag{3}

Where:

- \( y \) = Food security status measured as dichotomous response variable (1 = food secure, 0 = not food secure)
- \( x_1 \) = Household size (number of members of the household)
- \( x_2 \) = Household annual income (naira)
- \( x_3 \) = Farming experience (years)
- \( x_4 \) = Membership of cooperative (years)
- \( x_5 \) = Extension (number of extension contacts)
- \( x_6 \) = Education (years of formal schooling)
- \( x_7 \) = Farm size (hectares)
- \( \beta_1 \)–\( \beta_7 \) = coefficients for the respective variables in the logit function
- \( a \) = constant term
- \( \mu \) = error term

3. Results and Discussion

3.1 Food security status of maize farming households

The result of the food security status of the respondents using their food security indices is presented in Table 1. Based on the recommended daily calorie intake (R) of 2260 Kcal, the head count ratio showed that 54% of the maize farming households were food secure with an average daily per capita household calorie consumption of 6415.80Kcal and 46% of the maize farming households with an average daily per capita calorie consumption of 1321.52 were food insecure. The shortfall/surplus index which measures the extent of deviation from the food security line by the households was also estimated. The food secured maize farming households had a surplus index of 0.77 and the food insecure maize farming households had a shortfall index of 0.24 indicating that food secure households exceeded the calorie requirement by 77% while the food insecure households fell short the calorie requirement by 24%. This implies that majority of the maize farming households in the study area are food secured.

<table>
<thead>
<tr>
<th>Maize Farming Households</th>
<th>Food secured</th>
<th>Food insecure</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household recommended daily calorie intake (Kcal/day)</td>
<td>2260</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household daily per capita calorie consumption (kcal/day)</td>
<td>6415.80</td>
<td>1321.52</td>
<td>4072.43</td>
</tr>
<tr>
<td>Food security index</td>
<td>2.83</td>
<td>0.58</td>
<td>1.8</td>
</tr>
<tr>
<td>Head count</td>
<td>0.54</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>Shortfall index</td>
<td>-</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Surplus index</td>
<td>0.77</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

NB: (-) implies not applicable

3.2 Perception of maize farming households on the contribution of maize farming to their household food security

Responses to the importance of maize farming contribution to household food security in the study area were measured on a 5-point Likert-type scale with values of very important = 5, important = 4, undecided = 3, unimportant = 2 and very unimportant = 1. A cut off point of 3.00 was used to determine the maize farming households perception regarding the importance of maize production in contributing to their household food security. Hence, a mean score of 3.00 and above depicts that maize farming contributes to household food security in the study area. The result in Table 2 Showed that a larger proportion of the maize farming households (87%) perceived maize farming to be very important to their household food security, 13% of the respondents perceived maize farming to be important and none of the respondents were undecided or perceived maize farming to be unimportant or very unimportant. The mean perception score was estimated to be 4.87 and was above the cut off point (3.00) and this implies that the respondent perceived maize farming to be important in contributing to their household food security.

<table>
<thead>
<tr>
<th>Likert scale</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very important</td>
<td>87</td>
<td>87</td>
</tr>
<tr>
<td>Important</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Undecided</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unimportant</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Very unimportant</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Mean perception score = 4.87

Cut off point = 3.00
3.3 Factors influencing food security among maize farming households

As shown in Table 3, the logistic model explains 81% of the total variation in the food security status of households. The chi-square statistics shows that the variables included in the model were significantly different from zero at 1% level of probability.

Household size was negative and significant at 1% level of probability, suggesting that the larger the household, the more food insecure the respondents. A unit increase in household size decreases the likelihood that the household will be food secured by a factor of 0.233. This implies that respondents with large household size are more prone to food insecurity than those with small household sizes. Large household size translates into higher consumption expenditure of households. This result is similar to that obtained by [15] in his study on the determinants of food insecurity among arable farmers in Edo State Nigeria. He found household size to be positively related to the probability of a household being food secure. The finding of this study also agrees with [16] who reported that household food availability is negatively related to household size.

Household income was positive and significant at 10% level. This indicates that the higher the household income, the higher is the probability that the households will be food secure. The result implies that a unit increase in household farm income increases the likelihood that the household will be food secure by a factor of 2.203. This could be expected because increased income, other things being equal, means increased access to food. The result is similar to the findings of [13] who found household income of household head to be significant and positively related to food security.

Membership of cooperatives has a positive coefficient, which though not significant but agrees with a priori expectation. This implies that membership of cooperative will lead to increase in the odds in favour of food security because cooperatives are viewed as vehicles for development in rural areas in terms of credit accessibility and exchange of ideas that can improve their productivity and household food security. This finding agrees with [17] and [13] who indicated that membership of cooperative was significant in influencing food security in their respective studies.

Farming experience has a negative coefficient and it is not significant. This implies that increase in farming experience will lead to decrease in food security. This is not in agreement with expectation. The negative effect may be derived from aging or reluctance to change from old and familiar farm practices and techniques to those that are modern and improved[18]. This result is not in line with [18] who indicated that years of farming experience of household heads is positively related to food security.

Extension has negative coefficient and it is not significant. This implies that extension contact with the respondents will lead to a reduction in food security of households. This is contrary to expectation. The negative sign could be due to inadequate extension service delivery in the study area and as such the benefits of extension must have eluded the farmers. This result is not in line with [18] who indicated that access to extension agent is significant factor affecting food security.

Education was positive and significant at 1% level. This implies that the higher the educational level, the more food secure the farmers and vice versa. This implies that a unit increase in household education increases the likelihood that the household will be food secure by a factor of 0.527. This is because education enhances the productivity of the respondents and the respondents tend to be better informed and have better food management techniques that will ensure equitable all round supply of food.

Farm size was found to exert positive and significant (5%) influence on food security status of the respondents. The result implies that a unit increase in household education increases the likelihood that the household will be food secure by a factor of 1.080. This implies that the likelihood of households being food secure increases with an increase in farm size. This result agrees with the findings of [19] who found farm size of household head to be significant and positively related to food security.

### Table 3: Parameter Estimates of the Logistic Regression Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>β</th>
<th>SE</th>
<th>Sig</th>
<th>Exp. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.844</td>
<td>0.998</td>
<td>0.398</td>
<td>0.430</td>
</tr>
<tr>
<td>Household size</td>
<td>-0.233***</td>
<td>0.081</td>
<td>0.004</td>
<td>0.792</td>
</tr>
<tr>
<td>Household income</td>
<td>2.203*</td>
<td>0.868</td>
<td>0.011</td>
<td>9.050</td>
</tr>
<tr>
<td>Farming experience</td>
<td>-0.022</td>
<td>0.026</td>
<td>0.405</td>
<td>0.978</td>
</tr>
<tr>
<td>Cooperative</td>
<td>0.833</td>
<td>0.792</td>
<td>0.293</td>
<td>2.300</td>
</tr>
<tr>
<td>Extension</td>
<td>-0.834</td>
<td>0.170</td>
<td>0.002</td>
<td>0.434</td>
</tr>
<tr>
<td>Education</td>
<td>0.527***</td>
<td>0.466</td>
<td>0.20</td>
<td>1.694</td>
</tr>
<tr>
<td>Farm size</td>
<td>1.080**</td>
<td>0.998</td>
<td>0.398</td>
<td>0.430</td>
</tr>
</tbody>
</table>

Model chi-square = 60.182***
-2log likelihood = 77.445
Percentage prediction = 81%

*** = significant at 1%  ** = significant at 5%  * = significant at 10%

4. Conclusion and Recommendation

The study established that 54% of the maize farming households in the study area was food secure while 46% were food insecure. The factors significant in influencing food security of the maize farming households were household size, household income, farming experience, association, extension, education and farm size. Maize farming contributed to the household food security and therefore, maize production offers an opportunity for increasing household food security. Therefore, it is recommended that farmers should adopt proper maize farming management practices aimed at high intensity of maize production which will serve as a strategy for reducing food insecurity.

5. References


*****
VOLATILITY IN STOCK MARKET: EVIDENCE FROM INDIA

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\textsuperscript{b}Professor & Head, Department of Business Administration, Thiagarajar College, Madurai, Tamilnadu, India.

ABSTRACT: Volatility has been one of the most active and successful areas of research in time series econometrics and economic forecasting in recent decades. Volatility is a statistical measure of the dispersion of returns for a given security or market index. The main objective of the study is to analyze the volatility of Indian stock market. We have taken five oil sector companies from BSE for this study. The sample companies are Bharath Petroleum, Hindustan Petroleum, Indian Oil, ONGC and Reliance Industries. The Study was conducted from January 2007 to December 2012 and we employed Descriptive Model and Unit Root Test and GARCH Model for making the research more effective and we found that there is high volatility during the study period.

Keywords: Stock Market, Volatility, GARCH Model, Unit Root Test.

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INTRODUCTION

Volatility is a statistical measure of the dispersion of returns for a given security or market index. Volatility is generally measured either by using the standard deviation or variance between returns from that same security or market index. Commonly, the higher the volatility, the riskier is the security. In terms of options pricing, volatility is a variable in option-pricing formula showing the extent to which the return of the underlying asset will fluctuate between now and the options expiration. Volatility, expressed as a percentage coefficient within option-pricing formula, arises from daily trading activities. How volatility is measured will affect the value of the coefficient used.

Volatility is the variability of the asset price changes over a particular period of time and it is very hard to predict it correctly and consistently. In financial markets volatility presents a strange paradox to the market participants, academicians and policy makers – without volatility superior returns are cannot be earned, since a risk free security offers meager returns, on the other hand if it is ‘high’ it will lead to losses for the market participants and represent costs to the overall economy. Therefore there is no gainsaying with the statement that volatility estimation is an essential part in most finance decisions be it asset allocation, derivative pricing or risk management.

Volatility is an important phenomenon in markets in general and security markets in particular. Modeling stock market volatility has been the subject of empirical and theoretical investigation by both academicians and practitioners. As a concept, volatility is simple and intuitive. It measures the variability or dispersion about a central tendency. In other words, it measures how for the current price of an asset deviates from its average past values. The study of volatility becomes more important due to the growing linkages of national markets in currency, commodity and stock with rest of the world markets and existence of common players have given volatility a new property- that of its speedy transmissibility across markets. To many among the general public, the term volatility is simply synonymous with risk: in their view high volatility is to be deplored, because it means that security values are not dependable and the capital markets are not functioning as well as they should.

IMPLIED VOLATILITY

An essential element determining the level of option prices, volatility is a measure of the rate and magnitude of the change of prices (up or down) of the underlying. The volatility of a stock, $\sigma$, is a measure of our uncertainty about the returns provided by the stock.

The volatility of a stock price can be defined as the standard deviation of the return provided by the stock in one year when the return is expressed using continuous compounding. If volatility is high, the premium on the option will be relatively high, and vice versa. Once the measure of statistical volatility (SV) for any underlying has been obtained, we can plug the value into a standard options pricing formula showing the fair market value of an option. A model's fair market value, however, is often out of line with the actual market value for that same option. This is known as option mispricing. What does this all mean? To answer this question, a closer look at the role IV plays in option pricing is warranted.

NATURE OF STOCK MARKET VOLATILITY IN EMERGING MARKETS

There are few studies which examined emerging equity market volatility. Bekaert and Harvey (1995) examined the emerging equity market characteristics in relation to developed markets. Emerging markets found to have four distinguishing features: average returns were higher, correlations with developed markets returns were low, returns were more predictable and volatility is higher. They argued that modeling volatility is difficult in emerging markets, especially in segmented markets. In fully integrated markets volatility is strongly influenced by world factors whereas in segmented markets it is strongly influenced by local factors. More open economies had lower volatility and political risk to a large extent explained the cross sectional variation in volatility. Finally, they found...
significant decline in volatility in emerging markets following capital market liberalization. Bekaert et al. (1998) argued that emerging markets returns are highly non-normally distributed and exhibit positive skewness in it.

REVIEW OF LITERATURE

The study conducted by Sharpe (1966). He conducted a performance evaluation of 34 Open-ended oil during the period 1954-63 by the measure so developed. He found the performance of 11 funds superior to that of Dow Jones Industrial Average (DJIA). His study concluded that out of 34 funds selected, 19 had outperformed the benchmark in terms of total risk.

Treynor and Mazuy (1966) found no statistical evidence that investment managers of the 57 funds had successfully outgessed the market. The results suggested that the returns for an investor in oil was completely depend on fluctuations in the general market.

It did suggest that improvement in the rate of return was due to the fund manager’s ability to identify under priced securities of industries and companies and not because of their ability to outguess turns in the level of market as a whole. These findings were based on the methodology developed earlier for reviewing the performance of fund management.

A study on the performance of oil sector by Jenson developed a composite portfolio evaluation technique that considered returns adjusted for risk differences and used it for evaluating 115 open-ended oil sector during the period 1945-66. For the full period, Jenson examined returns net of expenses and gross of expenses. The analysis of net returns indicated that 39 funds (34%) had above average returns adjusted for risk, while 7666% experienced abnormality poor return.

Carlson in his study on the aggregate performance of oil sector (1970), examined the overall performance of Mutual Funds for the period 1948-1967 with emphasis on analyzing the effect of market series used over different time periods. The analysis of performance relative to the market indicated that results are heavily dependent on the market series used, viz; S and P 500, NYSE composite or DJIA. The results indicated no relationship with size or expense ratio, although there was a relationship between performance and a measure of new cash into funds.

STATEMENT OF THE PROBLEM

Most of the stock market investors are not able to pick rights stocks at right time and they met with loss. Our project work is taken to give guidance to the investors on how to invest in stocks at right time.

OBJECTIVES OF THE STUDY

❖ To analyze the volatility behaviour of selected companies listed in BSE.
❖ To analyze the volatility using GARCH model.

SCOPE OF THE STUDY

❖ This study helps us to understand the Indian stock market and its significant growth and guiding the investors for their investment.
❖ This study helps to know the reasons for volatility in Stock Market.
❖ This study can also be used as a referral for other forth coming studies in the similar field.

SAMPLE DESIGN

❖ Sampling Area: Indian Stock Market.
❖ Population: The population of the study is taken from BSE India.
❖ Sample Companies: 5 Oil Sector Companies Selected from BSE.
❖ Study Period: The study is being taken from January 2007 to December 2012 (Monthly Closing price).
❖ Sampling Techniques: The research has adopted the non-probability convenience sampling. A convenience sampling is one in which the sample units are chosen primarily on the basis of the convenience to the investigator.

SAMPLE COMPANIES FOR THE STUDY

➢ Bharath Petroleum Corporation Limited
➢ Hindustan Petroleum Corporation Limited
➢ Indian Oil Corporation Limited
➢ Oil and Natural Gas corporation Limited
➢ Reliance Industries Limited

TOOLS USED FOR THE STUDY

❖ Descriptive Model
❖ Unit Root Test
❖ GARCH Model

Software Used

E.Views-7

❖ DESCRIPTIVE MODEL

Descriptive statistics are typically distinguished from inferential statistics. With descriptive statistics you are simply describing what is or what the data shows. With inferential statistics, you are trying to reach conclusions that extend beyond the immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think.
UNIT ROOT TEST

A linear stochastic process has a unit root if 1 is a root of the process's characteristic equation. Such a process is non-stationary. If the other roots of the characteristic equation lie inside the unit circle — that is, have a modulus (absolute value) less than one — then the first difference of the process will be stationary.

- **AR(1) models**
  - Model: \( Y_t - \mu = \rho (Y_{t-1} - \mu) + \epsilon_t \)
  - \( Y_t \) = observation at time \( t \)
  - \( \epsilon_t \) = error or "shock" at time \( t \) (assumed id normal)
  - \( \mu \) = series mean (assumed constant over time)
  - \( \rho \) = Autoregressive coefficient

GARCH MODEL

Generalized Auto Regressive Conditional Heteroskedasticity (GARCH) Process

An econometric term developed in 1982 by Robert F. Engle, an economist and 2003 winner of the Nobel Memorial Prize for Economics to describe an approach to estimate volatility in financial markets. There are several forms of GARCH modeling. The GARCH process is often preferred by financial modeling professionals because it provides a more real-world context than other forms when trying to predict the prices and rates of financial instruments.

DATA ANALYSIS AND INTERPRETATION

DESCRIPTIVE STATISTICS

<table>
<thead>
<tr>
<th>Index</th>
<th>Mean</th>
<th>Median</th>
<th>Std.dev</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPCL</td>
<td>0.048521</td>
<td>-0.070000</td>
<td>-2.612705</td>
<td>0.702160</td>
<td>6.609628</td>
</tr>
<tr>
<td>HPCL</td>
<td>-0.453544</td>
<td>-0.630000</td>
<td>2.686514</td>
<td>0.711123</td>
<td>6.355765</td>
</tr>
<tr>
<td>IOC</td>
<td>-0.453544</td>
<td>-0.630000</td>
<td>2.686514</td>
<td>0.711123</td>
<td>6.355765</td>
</tr>
<tr>
<td>ONGC</td>
<td>0.056543</td>
<td>0.000000</td>
<td>2.322051</td>
<td>0.185370</td>
<td>7.559834</td>
</tr>
<tr>
<td>RELIANCE</td>
<td>0.094768</td>
<td>0.050000</td>
<td>2.563964</td>
<td>0.299623</td>
<td>9.761782</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The table presents a summary of Descriptive Statistics for month ending returns of the oil Industries. The mean average returns were high for Reliance Industries compared to other companies. The mean average returns were low for HPC, IOC. The median average returns were high for Reliance Industries. The median average return was low for Bharath Petroleum. The skewness values are positive and kurtosis too.

UNIT ROOT TEST

<table>
<thead>
<tr>
<th>Test critical values</th>
<th>( t )-statistic</th>
<th>Prob*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% level</td>
<td>-3.434543</td>
<td>0.0000</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.863279</td>
<td></td>
</tr>
<tr>
<td>10% level</td>
<td>-2.567744</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

Table 4.2 reports the results of Augmented Dickey Fuller Test of Stationary of Bharath petroleum returns for the study period. It is to be noted that the Bharath petroleum are stationary in the level difference itself with the value of -38.26077 and with the probability value of 0.00000. The test statistic value was smaller than the Test Critical values were -3.434543, -2.863279 and -2.567744 at 1% level, 5% level and 10% level respectively. It is concluded that during the study period, the returns of Bharath petroleum were stationary in the level difference itself. Hence, the return values were considered to be stationary.

TABLE NO.4.3 UNIT ROOT TEST FOR HINDUSTAN PETROLEUM CORPORATION

<table>
<thead>
<tr>
<th>Test critical values</th>
<th>( t )-statistic</th>
<th>Prob*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% level</td>
<td>-7.325169</td>
<td>0.0000</td>
</tr>
<tr>
<td>5% level</td>
<td>-2.863291</td>
<td></td>
</tr>
<tr>
<td>10% level</td>
<td>-2.567751</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

Table 4.3 reports the results of Augmented Dickey Fuller Test of Stationary of Hindustan petroleum returns for the study period. It is to be noted that the Hindustan petroleum are stationary in the level difference itself with the value of -7.325169 and with the probability value of 0.00000. The test statistic value was smaller than the Test Critical values were -3.434570, -2.863291 and -
2.567751 at 1% level, 5% level and 10% level respectively. It is concluded that during the study period, the returns of Hindustan petroleum were stationary in the level difference itself. Hence, the return values were considered to be stationary.

TABLE NO.4.4 UNIT ROOT TEST FOR HINDUSTAN PETROLEUM CORPORATION

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller test statistic</th>
<th>t-statistic</th>
<th>Prob*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-7.325169</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Test critical values

<table>
<thead>
<tr>
<th>Level</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>-3.434570</td>
</tr>
<tr>
<td>5%</td>
<td>-2.863291</td>
</tr>
<tr>
<td>10%</td>
<td>-2.567751</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

Table – 4.4 reports the results of Augmented Dickey Fuller Test of Stationary of Hindustan petroleum returns for the study period. It is to be noted that the Hindustan petroleum are stationary in the level difference itself with the value of -7.325169 and with the probability value of 0.0000. The test statistic value was smaller than the Test Critical values were -3.434570, -2.863291 and -2.567751 at 1% level, 5% level and 10% level respectively. It is concluded that during the study period, the returns of Hindustan petroleum were stationary in the level difference itself. Hence, the return values were considered to be stationary.

TABLE NO. 4.5 UNIT ROOT TEST FOR OIL AND NATURAL GAS CORPORATION LIMITED

| Augmented Dickey-Fuller test statistic | -37.00278  | 0.0000 |

<table>
<thead>
<tr>
<th>Level</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>-3.434543</td>
</tr>
<tr>
<td>5%</td>
<td>-2.863279</td>
</tr>
<tr>
<td>10%</td>
<td>-2.567744</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

Table-4.5 reports the results of Augmented Dickey Fuller Test of Stationary of Oil And Natural Gas Corporation Limited returns for the study period. It is to be noted that the Oil And Natural Gas Corporation Limited are stationary in the level difference itself with the value of -37.00278 and with the probability value of 0.00000. The test statistic value was smaller than the Test Critical values were -3.434543, -2.863279 and -2.567744 at 1% level, 5% level and 10% level respectively. It is concluded that during the study period, the returns of Oil And Natural Gas Corporation Limited were stationary in the level difference itself. Hence, the return values were considered to be stationary.

TABLE NO.4.6 UNIT ROOT TEST FOR RELIANCE INDUSTRIES

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller test statistic</th>
<th>-35.84324</th>
<th>0.0000</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Level</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>-3.434543</td>
</tr>
<tr>
<td>5%</td>
<td>-2.863279</td>
</tr>
<tr>
<td>10%</td>
<td>-2.567744</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

Table-4.6 reports the results of Augmented Dickey Fuller Test of Stationary of Reliance Industries returns for the study period. It is to be noted that the Reliance Industries are stationary in the level difference itself with the value of -35.84324 and with the probability value of 0.0000. The test statistic value was smaller than the Test Critical values were -3.434543, -2.863279 and -2.567744 at 1% level, 5% level and 10% level respectively. It is concluded that during the study period, the returns of Reliance Industries were stationary in the level difference itself. Hence, the return values were considered to be stationary.

GARCH MODEL

TABLE NO. 4.7 GARCH MODEL FOR BHARATH PETROLEUM

GARCH = C(1) + C(2)*RESID(-1)^2 + C(3)*GARCH(-1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Equation</td>
<td>0.579671</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RESID(-1)</td>
<td>-0.012067</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.519575</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The results of GARCH (1, 1) effect for Bharath petroleum returns are given in Table-4.7. According to the Table, the effect of mean equation co-efficient of Bharath petroleum was 0.579671. The Co-efficient of parameters Bharath petroleum ‘C’ at 0.579671, Resid (-1) at -0.012067 and GARCH (-1) 0.519575. The sum of Resid (-1) + GARCH (-1) Bharath petroleum was close to one. This reveals the Bharath petroleum experienced the lower volatility. It’s not at the very risky to the investors during the study period from 2006 to 2012.
### TABLE NO. 4.8 GARCH MODEL FOR HINDUSTAN PETROLEUM CORPORATION

GARCH = C(1) + C(2)*RESID(-1)^2 + C(3)*GARCH(-1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.261509</td>
<td>0.052695</td>
<td>4.962700</td>
<td>0.0000</td>
</tr>
<tr>
<td>RESID(-1)^2</td>
<td>0.092654</td>
<td>0.013912</td>
<td>6.660110</td>
<td>0.0000</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.874272</td>
<td>0.017940</td>
<td>48.73412</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The results of GARCH (1, 1) effect for Hindustan petroleum returns are given in Table-4.8. According to the Table, the effect of mean equation co-efficient of Hindustan petroleum was 0.261509. The Co-efficient of parameters Hindustan petroleum ‘C’ at 0.261509, Resid (-1) at 0.092654 and GARCH (-1) 0.874272. The sum of Resid (-1) + GARCH (-1) Hindustan petroleum was close to one. This reveals the Hindustan petroleum experienced the lower volatility. It’s not at the very risky to the investors during the study period from 2006 to 2012.

### TABLE NO. 4.9 GARCH MODEL FOR INDIAN OIL CORPORATION LIMITED

GARCH = C(1) + C(2)*RESID(-1)^2 + C(3)*GARCH(-1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.004776</td>
<td>0.000348</td>
<td>13.73441</td>
<td>0.0000</td>
</tr>
<tr>
<td>RESID(-1)^2</td>
<td>0.194230</td>
<td>0.018241</td>
<td>10.64791</td>
<td>0.0000</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.837521</td>
<td>0.012060</td>
<td>69.44739</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The results of GARCH (1, 1) effect for Indian Oil Corporation Limited returns are given in Table - 4.9. According to the Table, the effect of mean equation co-efficient of Indian Oil Corporation Limited was 0.004776. The Co-efficient of parameters Indian Oil Corporation Limited ‘C’ at 0.004776, Resid (-1) at 0.194230 and GARCH (-1) 0.837521. The sum of Resid (-1) + GARCH (-1) Indian Oil Corporation Limited was close to one. This reveals the Indian Oil Corporation Limited experienced the lower volatility. It’s not at the very risky to the investors during the study period from 2006 to 2012.

### TABLE NO. 4.10 GARCH MODEL FOR OIL AND NATURAL GAS CORPORATION LIMITED

GARCH = C(1) + C(2)*RESID(-1)^2 + C(3)*GARCH(-1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.097199</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RESID(-1)^2</td>
<td>-0.012044</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.519606</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The results of GARCH (1, 1) effect for Oil And Natural Gas Corporation Limited returns are given in Table - 4.10. According to the Table, the effect of mean equation co-efficient of Oil And Natural Gas Corporation Limited was 1.097199. The Co-efficient of parameters Oil and Natural Gas Corporation Limited ‘C’ at 1.097199, Resid (-1) at -0.012044 and GARCH (-1) 0.519606. The sum of Resid (-1) + GARCH (-1) Oil And Natural Gas Corporation Limited was close to one. This reveals the Oil And Natural Gas Corporation Limited experienced the lower volatility. It’s not at the very risky to the investors during the study period from 2006 to 2012.
### TABLE NO.4.11 GARCH MODEL FOR RELIANCE INDUSTRIES

GARCH = $C(1) + C(2)*RESID(-1)^2 + C(3)*GARCH(-1)$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>z-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance Equation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$C$</td>
<td>0.478221</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>RESID(-1)^2</td>
<td>-0.012072</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>GARCH(-1)</td>
<td>0.519567</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Compute from E Views Version 7

The results of GARCH (1, 1) effect for Reliance Industries returns are given in Table-4.11. According to the Table, the effect of mean equation co-efficient of Oil And Reliance Industries was 0.478221. The Co-efficient of parameters Reliance Industries ‘C’ at 0.478221, Resid (-1) at -0.012072 and GARCH (-1) 0.519567. The sum of Resid (-1) + GARCH (-1) Reliance Industries was close to one. This reveals the Reliance Industries experienced the lower volatility. It’s not at the very risky to the investors during the study period from 2006 to 2012.

### FINDINGS

**BHARATH PETROLEUM**

- The result of Augmented Dickey Fuller Test is noted that the Bharath petroleum is stationary in the level difference itself with the value of -38.26077.
- The results of GARCH (1, 1) effect for Bharath petroleum The Co-efficient of parameters Bharath petroleum ‘C’ at 0.579671, Resid (-1) at -0.012067 and GARCH (-1) 0.519575.

**HINDUSTAN PETROLEUM**

- The results of Augmented Dickey Fuller Test is noted that the Hindustan petroleum are stationary in the level difference itself with the value of -7.325169.
- The results of GARCH (1, 1) effect for Hindustan petroleum The Co-efficient of parameters Hindustan petroleum ‘C’ at 0.261509, Resid (-1) at 0.092654 and GARCH (-1) 0.874272.

**OIL AND NATURAL GAS CORPORATION LIMITED**

- The result of Augmented Dickey Fuller Test is noted that the Oil And Natural Gas Corporation Limited are stationary in the level difference itself with the value of 37.00278.
- The results of GARCH (1, 1) effect for Oil And Natural Gas Corporation Limited The Co-efficient of parameters Oil And Natural Gas Corporation Limited ‘C’ at 1.097199, Resid (-1) at -0.012044 and GARCH (-1) 0.519606.

**RELIANCE INDUSTRIES**

- The results of Augmented Dickey Fuller Test is noted that the Reliance Industries are stationary in the level difference itself with the value of -35.84324.
- The results of GARCH (1, 1) effect for Reliance Industries. The Co-efficient of parameters Reliance Industries ‘C’ at 0.478221, Resid (-1) at -0.012072 and GARCH (-1) 0.519567.

**INDIAN OIL CORPORATION LIMITED**

- The result of Augmented Dickey Fuller Test is noted that the Indian Oil Corporation Limited are stationary in the level difference itself with the value of -5.336787.
- The results of GARCH (1, 1) effect for Indian Oil Corporation Limited. The Co-efficient of parameters Indian Oil Corporation Limited ‘C’ at 0.004776, Resid (-1) at 0.194230 and GARCH (-1) 0.837521.

### CONCLUSION

One and half years ago, stock market (SENSEX) has crashed from 20,000 to 9000 because of economic crisis in US economy. It affected stock market throughout the world. So majority of the people started selling their shares to avoid the huge loss. It further reduced the SENSEX value and broke the past twenty year’s record. Now the situation is slowly recovering with the help of steps taken by government of all countries. So this is chance for the investors to get more profit in the future by investing the money on the selected sectors.
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Technical Efficiency Differential of Groundnut Production in Jigawa State, Nigeria

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ABSTRACT: This study was undertaken to principally determine the technical efficiency differential of groundnut production by adopters and non-adopters of Institute for Agriculture (IAR) groundnut varieties in Jigawa state, Nigeria. Interview schedule was used to collect data from a sample of 227 respondents who were selected randomly from the four agricultural zones in the study area. The analytical tools employed in data analysis include descriptive statistics and stochastic frontier production function. The result of the Maximum Likelihood Estimation of the stochastic frontier production function revealed that the maximum, minimum and mean efficiencies of farmers who adopted IAR groundnut varieties were 91%, 18% and 70% respectively while in the case of farmers who did not adopt, the maximum, minimum and mean efficiencies were 88%, 18% and 63%. This implies that the farmers who adopted IAR groundnut varieties are more technically efficient than farmers who did not adopt IAR groundnut varieties. Therefore, adopting of IAR groundnut varieties by farmers can contribute in enhancing their technical efficiency. The sources of technical inefficiency of adopters of IAR groundnut varieties were age (P<0.01), family size (P<0.01), education (P<0.01), extension (P<0.01) and credit (P<0.05). The result of the inefficiency model of the non-adopters of IAR groundnut varieties revealed that the major factors influencing the technical inefficiency were family size (P<0.01), education (P<0.01), farming experience (P<0.05) and extension contact (P<0.05). Based on the findings of the study, it is recommended that Government should fast track seed multiplication and distribution through effective extension service delivery to farmers so as to intensify and sustain the adoption of improved groundnut varieties towards enhancing the technical efficiency of groundnut farming households.

Keywords: Adopters, Institute for Agriculture (IAR), Groundnut, Non-adopters, Technical Efficiency.

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1. INTRODUCTION

Agriculture is an important sector in the economic development and poverty alleviation drive of many countries. The importance of this sector is more pronounced in the developing countries including Nigeria where it is the main thrust of national survival, employment, food and foreign exchange earnings [1][2]. In Nigeria, agricultural production is still carried out using physical strength, which declines with age. This has therefore been observed as one of the major constraints to agricultural production in Nigeria [3].

Groundnut is one of the most popular commercial crops in Nigeria. Nigeria produces 41% of the total groundnut production in West Africa [4]. During 2000-2009, the groundnut areas grew annually 2.6% in Nigeria but the yield declined by 3.3% annually resulting in stagnation of groundnut production at 2.9 million tonnes [5]. The production of groundnut in Nigeria fluctuated over the years from 1,565,000 tonnes in 1961 to 611,000 tonnes in 1985 and subsequently increased to 2,636,230 tonnes in 2010[6]. However, the yield of groundnut decreased remarkably from 16, 492 kg/ha in 1990 to 10, 000 kg/ha in 2010. The production of groundnut in Nigeria has suffered major setbacks from the groundnut rosette epidemics and foliar diseases, aflatoxin contamination and lack of sufficient and consistent supply of improved seed varieties [7]. This has significantly affected productivity and led Nigeria to lose its shares in the domestic, regional and international markets. To regain its competitiveness, groundnut yield would have to increase substantially using yield enhancing varieties. This prompted the development of improved groundnut varieties by IAR namely SAMNUT 1, SAMNUT 2, SAMNUT 3, SAMNUT 5, SAMNUT 6, SAMNUT 9, SAMNUT 10, SAMNUT 11, SAMNUT 16, SAMNUT 18, SAMNUT 19, SAMNUT 20, SAMNUT 21, SAMNUT 22, SAMNUT 23, SAMNUT 24.

Several empirical studies on economic aspect of groundnut production have been conducted in the study area but there exists a research gap in the area of technical efficiency of groundnut production by farmers who are using improved groundnut varieties developed by IAR and those who are using local groundnut varieties in the study. It is on this premise that this study was designed to fill the existing research gap and also contribute to the existing literature on technical efficiency of crop production in Nigeria. Hence, the specific objectives of the study were to:

1. estimate and compare the technical efficiency of the farmers that adopted IAR groundnut varieties and those who did not adopt IAR groundnut varieties in the study area.
2. Determine the sources of technical inefficiency of farmers who adopted IAR groundnut varieties and farmers who did not adopt IAR groundnut varieties in the study area.

2. THEORETICAL FRAMEWORK

2.1 Farm efficiency and production

Efficiency is the act of achieving good result with little waste of effort. It is the act of harnessing material and human resources and coordinating these resources to achieve better management goal. [8] distinguished between the types of efficiency (a) Technical Efficiency (TE), (b) Allocative Efficiency (AE) and (c) Economic Efficiency (ER), by saying that farm efficiency can be
measured in terms of all these type of efficiency. The appropriate measure of technical efficiency is input saving which gives the maximum rate at which the use of all the inputs can be reduced without reducing output. Technical efficiency is defined as the ability to achieve a higher level of output, given similar levels of inputs. Allocative efficiency deals with the extent to which farmers make efficiency decisions by using inputs up to the level at which their marginal contribution to production value is equal to the factor cost. Economic efficiency is concerned with the realization of maximum output in monetary term with the minimum available resources.

Production is defined as the transformation of goods and services into finished products (that is input-output relationship) and this is also applied to every production process, maize production inclusive. [9] define production process as one whereby some goods and services called inputs are transformed into other goods and services called output. In agriculture, the physical inputs which we use are: land, labour, capital and management.

3. METHODOLOGY

3.1 Description of the study area

Jigawa state lies between latitude11°N and 13°N and longitudes 8°E and 10° 35'E and shares a common border with Kano and Katsina state to the west, Bauchi state to the south-east, Yobe state to the east and Republic of Niger to the north. Its population was put at 4, 361, 002 people in 2006 [10] and a projected population of 5, 085, 762 people in 2011 at a growth rate of 3.2 percent per annum. 80% of the population is found in the rural areas and is made up of mostly Hausa, Fulani and Manga (a Kanuri dialect). The climate of the state is characterized by two distinct seasons; the rainy and dry seasons. The rainy season lasts from May to September with average rainfall of between 600 mm to 1000 mm. The climate of the area favours the production of crops such as maize, beans, groundnut, guinea corn, millet, cotton, yam, carrot, sugarcane, tomatoes, pepper, onions garden eggplant, lettuce, amaranthus and tobacco.

3.2 Sampling procedure and Sample Size

Multi-stage sampling technique was employed in selecting the groundnut farming households for this study. The first stage was a purposive selection of four Local Government Areas from the study area (one Local Government from each of the four ADP zones in the state). These Local Government Areas were selected on the basis of being the most prominent groundnut producing areas of the state. Secondly, eight villages were purposively selected (two villages from each of the four selected local government areas) on the basis of their high intensity of groundnut production activities. Thirdly, simple random sampling was employed in selecting 10% of the groundnut farming households to give a sample size of 227.

3.3 Method of Data collection

The study made use of primary data. Primary data were obtained through the use of well-structured questionnaire to be administered to household heads using well trained enumerators. The data collected during the field survey were on socio-economic characteristics such as age, gender, marital status, household size, farm size, income, access to credit, number of extension contacts, level of education of household heads and the household size. Also, data on input and output of groundnut production were also collected.

3.4 Analytical Technique

Stochastic production frontier was employed using the variant of the stochastic production function analysis adopted by [11]. The stochastic frontier production model has the advantage of allowing simultaneous estimation of individual technical and allocative efficiencies of the farmers as well as the determinants of technical efficiency [11]. Economic application of stochastic frontier model for efficiency analysis include [12] in which the model was applied to U.S agricultural data,[13] [14] [15] in which they offer comprehensive review of the application of the stochastic frontier model in measuring the technical and economic efficiencies of agricultural producers in developing countries. It is assumed that the farm frontier production function can be written as:

\[ Y_i = f(X_i, \beta) + e_i \]

Where:
- \( Y_i \) = quantity of agricultural output in specified unit
- \( X_i \) = is the vector of input quantities
- \( \beta \) = is the vector of production function or unknown parameters to be estimated
- \( f(X_i, \beta) \) = is a suitable functional form such as Cobb-Douglas

The production function \( f(X_i, \beta) \) is a measure of maximum potential output for any particular input Vector
- \( X_i \) = vector of the inputs used by the farm
- \( \beta \) = is the vector of parameters to be estimated
- \( e_i \) = is the error term and is the farm specific composite residual term comprising of a random error term \( V_i \) and an inefficiency component \( U_i \).

The Cobb-Douglas stochastic production function is stated as follows:

\[ Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + V - U \]

Where:
- \( Y \) = total farm output of groundnut (Kg)
- \( X_1 \) = cultivated farm area for groundnut (ha)
- \( X_2 \) = quantity of seeds planted (kg)
- \( X_3 \) = quantity of agrochemicals (litres)
- \( X_4 \) = quantity of labour (man days)
- \( X_5 \) = quantity of fertilizer used (kg)
\[ \beta = \text{Vector of the coefficients for the associated independent variables in the production function} \]

\[ U_{it} = \text{one sided component, which captures deviation from frontier as a result of inefficiency of the firm} \]

\[ V_{it} = \text{effect of random stocks outside the firm control, observation and measurement error and other stochastic (noise) error term.} \]

\[ \ln = \text{the natural logarithm (to base e)} \]

The technical inefficiency effects, \( U_i \), is specified as follows:

\[ U_i = \delta_0 + \delta_1Z_1 + \delta_2Z_2 + \delta_3Z_3 + \delta_4Z_4 + \delta_5Z_5 + \delta_6Z_6 + \delta_7Z_7 + \delta_8Z_8 + \delta_9Z_9 + \delta_{10}Z_{10} \]

4.0 RESULTS AND DISCUSSION

4.1 Technical efficiency of Adopters and Non-Adopters of IAR groundnut varieties

The MLE estimates of the parameters of the stochastic frontier production function as presented in Tables 1 and 2 shows that the estimated sigma squared for the adopters of IAR groundnut varieties (2.3349) and non-adopters of IAR groundnut varieties (2.1603) were significantly different from zero at 1% probability level. This indicates a good fit and the correctness of the specified distributional assumption of the composite error terms in the estimated models for the adopters and non-adopters. The value of gamma for the adopters (0.9266) and the non-adopters (0.8594) were significant at 1% suggesting that 93% and 86% of the shortfall below the frontier output of the adopters and non-adopters respectively was due to the inefficiencies of the farmers.

The estimated coefficient of land for adopters (7.3824) and non-adopters (0.8371) were positive and significant at 1% probability level respectively indicating that a unit increase in farm size of the farmers will lead to an increase in their output by a magnitude of 7.3824 and 0.8371 respectively *ceteris paribus*. This result is in line with [16] who reported that farm size was significant and had a positive relationship with the output level of farmers in a study on the efficiency of participation of youth in agriculture programme in Ondo State, Nigeria. The coefficient of seed for the adopters was positive and significant at 10% probability level indicating that a unit increase in seed will lead to an increase in output by a magnitude of 0.1157. This result agrees with that of [17] who reported a positive relationship between seed and output of rice farmers in a study on technical efficiency differentials in rice production technologies in Nigeria. While for the non-adopters, the coefficient of seed was negative and not significant. The estimated coefficient of labour for adopters and non-adopters was positive and significant at 1% and 5% probability levels respectively in line with *a priori* expectation indicating that a unit increase in labour use will bring about an increase in the output of the adopters and non-adopters. This finding disagrees with [18] who found that labour had a negative influence on the output of rural farmers in a study on technical and allocative efficiency analysis of Nigerian rural farmers. The estimated coefficient of fertilizer for the adopters was negative and significant at 5% probability level implying that a unit increase in the use of fertilizer will decrease output by a magnitude of 0.2640 while in the case of the non-adopters, it was not significant.

The result of the determinants of the technical inefficiency of the adopters and the non-adopters of IAR groundnut varieties are presented in Tables 1 and 2 respectively. Since the dependent variable of the inefficiency model represents the mode of inefficiency, a positive sign of an estimated parameter implies that the associated variable has a negative effect on efficiency but positive effect on inefficiency and vice versa [19]. The estimated age coefficient was positive with respect to various production inefficiencies of the adopters and non-adopters. This coefficient was statistically significant at 1% for the adopters. This implies that age contributed positively to their technical inefficiency and hence, as the farmers grow older, their technical efficiency decreases. The coefficient of age was not significant for the non-adopters. Family size was negative and significantly related to the technical inefficiency of the adopters as well as the non-adopters at 1% and 5% respectively. This finding is in line with that of [20] who reported that family size was negative and significantly related to the technical inefficiency of rice farmers in Taraba State, Nigeria. Education was negative and significantly related with the technical inefficiency of adopters and non-adopters at 1% probability level which implies that as the educational status of the farmers increases their technical inefficiency decreases thereby increasing their technical efficiency. Educated farmers are able to gather, understand and use information from research and extension more easily than illiterate farmers can. Moreover, educated farmers are very likely to be less risk-averse and therefore more willing to try out modern technologies. This result agrees with [21] who reported that education was negative and significantly related to the technical, allocative and economic efficiencies of Tomato Farms in Northern Pakistan. The coefficient of farming experience was significant at 1% and 5% probability levels respectively and positively related with the technical inefficiency of adopters and non-adopters. This finding is not in line with that of [17] who also reported that farming experience was negative and significant in their studies. The coefficient of extension contact had the expected negative sign and was significantly related with the technical inefficiency of adopters at 1% probability levels respectively. This implies that as the number of extension contacts of the adopters increases, their technical inefficiency decreases thereby increasing their technical efficiency. This result is in consonance with the finding of [18] who obtained similar result in their study. The coefficient of extension contact for the non-adopters had a positive sign and was significant at 5%. A similar finding was reported by other studies which found a positive relationship between farm level efficiency and availability of extension services [22] [23] [24] [14]. The coefficient of access to credit for adopters was negative and significant at 10%. This implies that the higher the access to credit, the more efficient the farmers became. This is in disagreement with [25], who showed that receiving credit contributed to farmers’ economic inefficiency. If production credit is invested on the farm, it is expected that this will lead to higher levels of output. Thus, access to credit is more likely to lead to an improvement in the level of technical efficiency of the adopters of IAR groundnut varieties. In the case of non-adopters of IAR groundnut varieties, access to credit was not significant.

Table 1.0: Maximum Likelihood Estimates of the parameters of Stochastic Frontier Production Function of farmers who adopted IAR groundnut varieties
Table 2.0: Frequency distribution of the technical efficiency of Adopters and non-adopters of IAR groundnut varieties

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Standard-error</th>
<th>T-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>7.9677*</td>
<td>0.9665</td>
<td>8.2442</td>
</tr>
<tr>
<td>Cultivated farm area</td>
<td>0.8371*</td>
<td>0.1271</td>
<td>6.5881</td>
</tr>
<tr>
<td>Seed</td>
<td>-0.0597</td>
<td>0.0726</td>
<td>-0.8228</td>
</tr>
<tr>
<td>Agro-Chemicals</td>
<td>-0.0669</td>
<td>0.0519</td>
<td>-1.2894</td>
</tr>
<tr>
<td>Labour</td>
<td>0.0437</td>
<td>2.4167</td>
<td>0.9266*</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>-0.1923</td>
<td>0.1548</td>
<td>-1.2420</td>
</tr>
<tr>
<td><strong>Inefficiency model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-2.2967</td>
<td>1.9757</td>
<td>-1.1625</td>
</tr>
<tr>
<td>Age</td>
<td>0.0425</td>
<td>0.0593</td>
<td>0.7172</td>
</tr>
<tr>
<td>Family size</td>
<td>-0.3901*</td>
<td>0.1303</td>
<td>-2.9938</td>
</tr>
<tr>
<td>Education</td>
<td>-0.2440*</td>
<td>0.0877</td>
<td>-2.7805</td>
</tr>
<tr>
<td>Farming experience</td>
<td>0.2904**</td>
<td>0.1306</td>
<td>2.2235</td>
</tr>
<tr>
<td>Extension</td>
<td>-0.0002</td>
<td>0.0002</td>
<td>-1.4632</td>
</tr>
<tr>
<td><strong>Variance parameters</strong></td>
<td></td>
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</tr>
<tr>
<td>Gamma</td>
<td>0.8594*</td>
<td>0.0671</td>
<td>12.7998</td>
</tr>
<tr>
<td>Sigma</td>
<td>2.1603*</td>
<td>3.1118</td>
<td></td>
</tr>
<tr>
<td>Log likelihood Function</td>
<td>-119.6118</td>
<td>85.957</td>
<td></td>
</tr>
</tbody>
</table>

NB: Values in parentheses are the standard errors, * P < 0.01, ** P < 0.05, *** P < 0.1

Table 3.0: Frequency distribution of the technical efficiency of Adopters and non-adopters of IAR groundnut varieties

<table>
<thead>
<tr>
<th>Efficiency</th>
<th>Adopters Frequency</th>
<th>Percentage</th>
<th>Non-Adopters Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10 – 0.19</td>
<td>1</td>
<td>0.9</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>0.20 – 0.29</td>
<td>1</td>
<td>0.9</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>0.30 – 0.39</td>
<td>3</td>
<td>2.7</td>
<td>1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

NB: Values in parentheses are the standard errors, * P < 0.01, ** P < 0.05, *** P < 0.1

4.2 Frequency distribution of the technical efficiency of Adopters and non-adopters of IAR groundnut varieties

The technical efficiency distribution of adopters and non-adopters as presented in Table 3.0 shows that 62.7% of the adopters of IAR groundnut varieties operated above 69% efficiency level compared to the non-adopters with 59.1% found to have operated above 69% efficiency level. Also, the most efficient farmer who adopted IAR groundnut varieties operated at 91% efficiency level and the least efficient adopter operated at 19% efficiency level with mean efficiency of 70% while in the case of the farmers who did not adopt, the most efficient farmer operated at 88% and the least efficient farmer operated at 18% with mean efficiency of 63%. This result clearly shows that farmers who adopted IAR groundnut varieties were more technically efficient than farmers who did not adopt. Although, the farmers who adopted these varieties were more technically efficient than the farmers who did not adopt, there is still opportunity for them to increase their efficiency by 30% through better use of available production resources given the level of technology. Also the non-adopters still have room to increase their efficiency of production by a range of 31% through efficient resource utilization given the current level of available resources.
The empirical findings of the study revealed that the maximum, minimum, and mean efficiencies of farmers who adopted IAR groundnut varieties were 91%, 18% and 70% respectively while in the case of farmers who did not adopt, the maximum, minimum, and mean efficiencies were 88%, 18%, and 63%. This suggests that adopters of IAR groundnut varieties were more efficient than farmers who are using local varieties and therefore, adoption of IAR groundnut varieties by farmers can be used as a verifiable tool for contributing in enhancing the technical efficiency of groundnut farmers in the study area. Resources of technical inefficiency of adopters of IAR groundnut varieties were statistically significant at 5% and 1% significance levels. The result of the inefficiency model revealed that the sources of technical inefficiency of adopters of IAR groundnut varieties were age (P<0.05), family size (P<0.01), education (P<0.01), extension (P<0.01), and credit (P<0.05). The result of the inefficiency model of the non-adopters of IAR groundnut varieties revealed that the major factors influencing the technical inefficiency were family size (P<0.01), education (P<0.01), farming experience (P<0.05) and extension contact (P<0.05). In line with the findings of the study, it is recommended that Government should fast track seed multiplication and distribution through effective extension service delivery to farmers so as to intensify and sustain the adoption of improved groundnut varieties towards enhancing the technical efficiency of groundnut farming households. This study also recommends that farmers education should be enhanced especially through extension education. This is because farmers education can aid in reducing the productive inefficiencies among groundnut farming households.

6.0 REFERENCES

<table>
<thead>
<tr>
<th>Efficiency (%)</th>
<th>Total</th>
<th>110</th>
<th>100.0</th>
<th>117</th>
<th>100.0</th>
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<tbody>
<tr>
<td>Minimum efficiency</td>
<td>19</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum efficiency</td>
<td>91</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean efficiency</td>
<td>70</td>
<td>63</td>
<td></td>
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</tbody>
</table>


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Examination of Suitability of Factor Endowment Theory with the reflection on Transportation Cost in International Business

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Abstract: International Business is a device which provides a support of convenience of exchanging goods or services or both between two or more countries. More prominently in a condition, one good is available abundant in one country and in the identical point of time there is a dearth and much demand from another country for the same or similar goods. During 18\textsuperscript{th} and 19\textsuperscript{th} century a number of international trade theories came into force with the aim of identifying course of action for smooth carrying of business by countries through export and import. Factor Endowment Theory is one of international trade theories focuses on effective international business with the optimum utilization of factors of production. The Factor Endowment theory was contributed by the Swedish Economists Eli Heckscher and Bertil Ohlin. It focuses on smoothening of international business in terms of exports and imports by using abundant factors of production and attaches the restraint on trade in order to get comparative advantage. One country must produce those products associated with such country’s abundant factor of production and import those products which are difficult to produce or the production leads to high product cost on account of lack of associated factor of production. This argument is justified on the premise that the exporting country is capable of producing the product with relatively low cost by effectively exploiting the associated abundant factor of production. Factor Endowment Theory holds valid only within the framework of assumptions. This paper examines the relationship between availability of abundant factors of production and international business with the profound connection with the transportation cost and essentially focuses on suitability of factor endowment theory with current trend.

Keywords: Factor Endowment, Capital, Labour Cost, Logistic, Transportation Cost, International Business.

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Introduction

The world is the bunch of a number of interdependent countries. They are interconnected for the mutual benefits. Each country is bestowed with different natural and human resources. In addition, each country has developed its own potentiality in certain identified areas. Hence, Creator-resources (natural resources) and created-resources serve as major factors of production of goods and services. As a result of its unique abilities, in terms of relevant factors of production, a country stands different with respect to cost of production of a product when compared to the cost of production of the same or similar product in other country. It means that a country is more efficient in producing a product by using its abundant factor of production where as in the same situation another country is very poor in producing the same or similar product as a result of lack of required factor of production. Eli Heckscher (1919) and Bertil Ohlin (1933) laid the groundwork for substantial developments in the theory of international trade by focusing on the potentiality of production based on the composition of countries’ factor endowments. The Heckscher–Ohlin Theorem states that the country which has a comparative advantage in commodities whose production is cheaper relatively on account of abundant factor, and hence, exports those commodities. Meanwhile, a country would import commodities whose production is relatively costlier on account of scarce factor of production. Thus, differences in comparative advantage are attributed to the differences in the availability of factor of production.

Factor Endowment Theory – A View

The Heckscher–Ohlin theory focuses on the relevant relationship of international business with factor of production. It considered two major and most important factors of production viz., labour and capital. Some countries are relatively well-endowed with capital but lack of labour force. In such countries, wage rates generally are high; as a result, the costs of producing labour-intensive goods—such as textiles, sporting goods, and simple consumer electronics—tend to be more expensive than in the countries with abundant labour and low wage rates. On the other hand, goods which require much capital and only a little labour (e.g., automobiles and chemicals) tend to be relatively inexpensive in the countries where abundant and cheap capital is available. Thus, countries with abundant capital should generally be able to produce capital-intensive goods relatively inexpensively and exporting them in order to pay for imports of labour-intensive goods. Factor Endowment theory states that a country exports those goods which are relatively more intensive in the factor and relatively more abundant in that country and import those goods which are relatively less intensive in the factor which relatively less abundant in that country.

Literature Review

Donald R. Davis (1995) explored with perfectly intra industry goods, factor intensities in the two sectors will always be the identical, at any factor prices, and for any factor endowments. Donald R. Davis David E. Weinstein Scott C. Bradford Kazushige Shimoto (1996), stated the Heckscher–Ohlin model under the conventional restrictive assumptions is a poor predictor of the international pattern of production, hence of net factor trade. However, this changes markedly when applied to predictions for regions of Japan. Given the long thread of empirical failures of Heckscher–Ohlin, it is surprisingly successful as a theory of the location of production and the
pattern of consumption – hence the net factor content of trade – off these regions. Edward E. Leamer (1995) stated that the HO model provides option to sell factor services externally transforms a local market for factor services into a global market. As a result, the derived demand for inputs becomes much more elastic and also more similar across countries. James R. Markusen, Anthony J. Venables (2000), shown that the world as a whole benefits from the presence of multinationals, and these gains accrue disproportionately to countries whose factor endowment is such that, in the absence of multinationals, they would have few national firms. There may be welfare loss for a country which, in the absence of multinationals, has a large share of the world industry.

Objectives of the Study
1. To study the importance of transportation cost in international exports and imports.
2. To study the influence of transportation cost on total cost and price per product.
3. To study the outcome of transportation cost ignorance and reflection in international trade and factor endowment theory.

Scope of the Study
This study essentially focuses on the influence of transportation cost on international business concurrently on factor endowment theory which has been contributed by Heckscher-Ohlin. And this study points out the effect of considering transportation, and for this examination it considers the relevant data of fourteen countries which are having the international trading with India. The Study mainly examines effects of ignoring ‘no transportation cost assumption’ of Factor Endowment Theory.

Research Methodology
The required information has been collected through reputed Journals, Research Papers, Books and websites.

Limitations
a) In international exports or imports the transportation cost is computed on the basis of weight, size, value of goods but this study has taken transportation cost solitary on the basis of value of goods.
b) The same currency has been considered for comparing cost, and ignored changes in currency values between various countries.

The Basic Theorems of the Heckscher-Ohlin Model
Theorem I (Stolper-Samuelson): A (small) change in relative prices and in factor rewards increases the real reward of the factor intensive in the production of the goods whose relative price has risen and reduce the real reward of the other factor, provided that the economy remains diversified.
Theorem II (Global Stolper-Samuelson): Theorem II applies to finite price changes leaving the economy diversified, provided that endowments are held fixed or that the technology does not exhibit factor intensity reversals.
Theorem III (Factor Price Equalization): For each P consistent with both goods being produced, there exists a cone H (P) of endowments such that all countries with endowments in H (P), and with the given technology, will have identical factor prices when freely trading at world prices P. The cone H (P) is of full dimensional as long as it does not coincide with a factor-intensity reversal.

Assumptions or Conditions to application of Factor Endowment Theory
- Two factors of production (e.g., land and labor)
- Competition in all markets
- Factor supplies are fixed, and there is no factor mobility
- Each factor is fully employed in each country with or without trade
- There are no transportation or information costs
- There are no imposed tariffs or other barriers to trade
- The production functions for each good are the same in the two countries
- All production functions are linearly homogeneous
- All production functions are immune to factor intensity reversals
- Both countries produce both goods with or without trade

One of the reasons why a country might have comparative advantage in a good is that countries differ in their factor endowments. There are two factors capital and labor. The home country is the capital abundant one, the one with more capital per unit of labor. One of the goods is more capital intensive than the other: it uses more capital per unit of labor than the other good. Countries have access to same technologies - factor endowments only difference between countries.

Under free trade, the capital abundant (home) country is expected to produce relatively more of the capital intensive good than the other country. Therefore it is expected to export the capital intensive goods if no strong bias in consumption. Owners of capital in the capital abundant (home) country benefit due to seeing their rents rise relative to prices of goods, while owners of labour (domestic workers) suffer due to seeing their wage fall relative to prices of goods. As long as capital endowments in the two countries are not too different, and capital intensive good is same in both countries, the wage and rent will be same across countries under free trade with no transport costs.

Analysis and Discussion
1. Identification of the strength of countries
The Factor Endowment Theory pre-supposes that the countries with the abundant factors have an edge over the other countries in the production of goods and effecting exports. An attempt has been made to identify the strength of countries in terms of factors and to analyse their impact on production and exports.
Table 1: Country-wise GDP per capita, Total Population, Area and Area per person

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Country</th>
<th>GDP per capita(USD)</th>
<th>Population</th>
<th>Area (square km)</th>
<th>Area per person (square km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Qatar</td>
<td>1,02,211</td>
<td>1,963,124</td>
<td>11,586</td>
<td>0.0059</td>
</tr>
<tr>
<td>2</td>
<td>Luxembourg</td>
<td>79,785</td>
<td>537,000</td>
<td>2,586</td>
<td>0.0048</td>
</tr>
<tr>
<td>3</td>
<td>Singapore</td>
<td>60,410</td>
<td>5,312,400</td>
<td>699</td>
<td>0.0001</td>
</tr>
<tr>
<td>4</td>
<td>Norway</td>
<td>55,009</td>
<td>5,063,709</td>
<td>323,802</td>
<td>0.0639</td>
</tr>
<tr>
<td>5</td>
<td>United States</td>
<td>49,012</td>
<td>316,163,000</td>
<td>9,629,091</td>
<td>0.0304</td>
</tr>
<tr>
<td>6</td>
<td>Canada</td>
<td>42,734</td>
<td>35,141,542</td>
<td>9,984,670</td>
<td>0.2841</td>
</tr>
<tr>
<td>7</td>
<td>Australia</td>
<td>42,642</td>
<td>23,072,354</td>
<td>7,692,024</td>
<td>0.3333</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>36,395</td>
<td>127,320,000</td>
<td>377,915</td>
<td>0.0030</td>
</tr>
<tr>
<td>9</td>
<td>France</td>
<td>35,548</td>
<td>65,657,000</td>
<td>551,500</td>
<td>0.0084</td>
</tr>
<tr>
<td>10</td>
<td>India</td>
<td>3900</td>
<td>1,210,569,573</td>
<td>3,287,263</td>
<td>0.0027</td>
</tr>
<tr>
<td>11</td>
<td>Pakistan</td>
<td>2,900</td>
<td>183,556,000</td>
<td>796,095</td>
<td>0.0043</td>
</tr>
<tr>
<td>12</td>
<td>Bangladesh</td>
<td>2,000</td>
<td>152,518,015</td>
<td>143,998</td>
<td>0.0009</td>
</tr>
<tr>
<td>13</td>
<td>Russia</td>
<td>17,709</td>
<td>143,400,000</td>
<td>17,098,242</td>
<td>0.1192</td>
</tr>
<tr>
<td>14</td>
<td>Mexico</td>
<td>15,312</td>
<td>117,409,830</td>
<td>1,964,375</td>
<td>0.0167</td>
</tr>
</tbody>
</table>

Source: IMF (GDP per capita) Report 2012

The above table reveals that the strength of countries in different factors [i.e., capital, population (labour), and land]. On the basis of data presented in the above table, the following observations are made:

a) Qatar, Luxembourg, Norway, Mexico and Japan have the strength of capital and labour but feeble in availability of land.

b) The countries such as India, Pakistan, and Bangladesh have good strength in the population which results in easy availability of labour, but feeble in availability of capital and land.

c) A few countries, such as Australia, Canada and Russia, possess’ capital and land but suffer from inadequacy of labour as a result of less population.

d) The United States of America possesses abundant capital, adequate land and manageable man power. Thus, USA exports all class of goods to other countries.

The main reasons for this kind of fluctuations are imbalance in distribution of natural resources, distinct birth rates, and asymmetrical economic conditions among various countries of the world. This disproportion provides an opportunity to use comparative advantage with mutual agreement between countries through exchange of goods or services.

2. Transportation Cost in International Business and Its Influence on Factor Endowment Theory

Transportation cost has significant impact on the structure of economic activities as well as on international trade. Transportation cost refers to the expenses incurred in moving products or assets from one place to other place, which is often passed on to consumers. In international business, the products are transferred to consumers residing in other country. This process requires huge transportation cost because, in cross-border trade, the distance of transferring goods is incredibly high compared to domestic trade. Hence, high transportation cost pushes up the price of the product.

An exercise has been made to ascertain the transportation cost (percentage of value) by considering the sea-distance from India to the countries selected for the present study. 10,000 kg of products of value of $ 1,00,000 are taken as sample for estimation of transportation cost. It is ensured that the transportation cost to include the provision for the cost of refrigeration and insurance.

Table 2: Transportation Cost of goods from India (Cochin port) to other Countries

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Country</th>
<th>Destination Terminal</th>
<th>Sea Distance (in km)</th>
<th>Freight (LCL = Gross weight 10,000 k.g. Value $ 1,00,000, Refrigerated, with Insurance) (USD)</th>
<th>% of Transportation Cost on Value of goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Qatar</td>
<td>Doha</td>
<td>3361.1</td>
<td>3940.27 – 4355.03</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Luxembourg</td>
<td>No Sea Route</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Singapore</td>
<td>Singapore</td>
<td>3439.1</td>
<td>4155.70 – 4593.14</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Norway</td>
<td>Alvik</td>
<td>13029.5</td>
<td>5638.57 – 6232.10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>United States</td>
<td>Charleston</td>
<td>16275.4</td>
<td>9127.00 - 10088.41</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Canada</td>
<td>Victoria</td>
<td>16383.2</td>
<td>10173.51 – 11,244.00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Australia</td>
<td>Melbourne</td>
<td>9278.6</td>
<td>5467.22 – 6042.82</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>Yokohama</td>
<td>8800.8</td>
<td>6107.98 – 6750.92</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>France</td>
<td>Rauen</td>
<td>8588.4</td>
<td>5690.22 – 6289.19</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Pakistan</td>
<td>Karachi</td>
<td>1936.0</td>
<td>2447.49 – 2705.12</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Bangladesh</td>
<td>Chittagong</td>
<td>2533.0</td>
<td>6083.73 – 6724.12</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Russia</td>
<td>Tuape</td>
<td>8405.0</td>
<td>4548.65 – 5077.45</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Mexico</td>
<td>Attamira</td>
<td>18619.9</td>
<td>10898.14 – 12045.32</td>
<td></td>
</tr>
</tbody>
</table>

Source: www.worldsearates.com

Note: LCL – Less Container Load, USD – US Dollars
The data in Table 2 reveals that the transportation cost from India to other countries is inconsistent as it depends on the distance. It is known fact as the distance increases that the transportation cost increases. It is evident from the data that the transportation cost would be 10 to 12 percent of the total value of product where Indian trader exporting commodity to USA, Mexico and some other countries extremely far from India. It is also known that the price of the product goes up with the increase in the cost. Therefore transportation cost would be added to original domestic cost while calculating product cost in importing country. Hence, the product which is Rs.100 in domestic country (India) might be equal to Rs.112 in importing countries (USA, Mexico). Consequently transportation cost influences on export and import. It is worth to be noted that the factor endowment theory assumes no transportation cost provides provision for fulfilling expectations of customer residing in different countries with the exchange of products which are associated with abundant factors of production. In the above example (refer to Figure 1), India is exporting vegetables and fruits, which are associated with one of India’s abundant factors of production (i.e., is labour), to the USA for Rs.109. A trader can sell the product (i.e. vegetables and fruits) at Rs.100 in India or he can export to US at Rs.109. It provides a comparative advantage for both the countries explicitly India and USA. The Factor Endowment Theory is applicable only in those situations where the product is produced by one country with relatively lower cost with the usage of abundant factors of production compared to other countries. In such a situation, the cost of imported goods becomes costlier than the cost of domestically produced products. Thus, when the transportation cost is considered in international trade, the comparative advantage on account of abundant factors will be nullified or even negated.

Outcome of the Factor Endowment Theory with the Contemplation of Transportation cost
1. Consideration of transportation cost tends to increase in the cost of product and it results in price hike.
2. The cost of the same product even with the consideration of transportation cost varies from country to country on account of variation in distance. Hence, the cost of export increases as distance increases.
3. Cost of logistic becomes very costly when distance is immense. In such a situation, the cost of imported goods becomes costlier than the cost of domestically produced products. Thus, when the transportation cost is considered in international trade, the comparative advantage on account of abundant factors will be nullified or even negated.

Findings
1. Countries’ abundant factor of production advantage becomes ineffective in international exchange of commodity when there is an existence of transportation cost.
2. Ignorance of transportation cost in international business leads to taking erroneous decision.
3. Customers of one country miss out from getting benefit of product allied with abundant factors of production of other country owing to transportation cost.
4. In several situations, cost of product in domestic country is cheaper than imported product due to high transportation cost.
5. In modern era, the maximum portion of cost of goods comprise of transportation cost. Therefore, ignorance of transportation cost leads to take false decision.

Conclusion
In international business, transportation cost is one of the major constituents in the product cost. The ignorance of transportation cost does not exhibit appropriate price of unit cost, and creates perplexity while taking decision in the firm. Transportation cost differs...
from country to country as the distance between exporting and importing countries differs, and increase in distance adds additional cost to the product. Countries’ abundant factor of production advantage may not be supportable if, there is a consideration of transportation in international business. So the factor endowment theory works only with the assumption of no transportation cost as mentioned in Factor Endowment Theory. But in modern days transportation cost is one of the major part of cost of production, thus ignorance of transportation cost not gives satisfactory awareness in exporting or importing of goods. Transportation cost is a pivotal cost component in modern international business and in utmost situation the ignorance of transportation cost could negate comparative cost advantage. Therefore, in most of the circumstances, the applicability of Factor Endowment Theory with the ignorance of transportation cost is not appropriate in modern era.

References
I. Books

II. Journals

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CONTEMPORARY ISSUES IN MANAGEMENT

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ABSTRACT: Millions of men and women spend their time as managers in diverse organizations and are confronted by complex challenges as they perform their routine functions. Management approaches require one to keep abreast of the times. However, the time had never been so challenging and, of course, so rewarding as it is today. In India the challenges emerged with the opening up of the economy which presented both pressures and opportunities. One of the major pillars supporting Nehruvian model of growth, Dr. Mammoohan Singh, himself dismantled the said model and has created a capitalist El-Dorado. Strategic sectors like Telecom, oil sector etc. have been thrown open. The foreign multinationals are bee lining to woo the same customers resulting in cut throat competition at the same time eager to collaborate in the field of research and development. To cap it all, all the national as well as regional political outfits are forced to join the chorus, when it comes to economic course of action.

INTRODUCTION
Millions of men and women spend their days as managers in diverse organizations. They are confronted by endless challenges as they strive to perform their routine functions. Management approaches require one to keep abreast of the times. The rewards come from knowing that effective and efficient management can make a real difference. Priority is given to innovation of newer products and services, by developing a team of committed personnel and thereby meeting the increasing expectations of the public, as also the government. In this article I have tried to highlight the changing role of managers in the 21st century, and the major issues which they need to be aware of. The most accepted management process popular since the advent of twentieth century has been the scientific management and used it for reducing waste and increasing efficiency in production which benefit industries. The most accepted management process popular since the advent of twentieth century has been the scientific management and used it for reducing waste and increasing efficiency in production which benefit industries. The most accepted management process popular since the advent of twentieth century has been the scientific management and used it for reducing waste and increasing efficiency in production which benefit industries.

The dynamic managers should always keep striving for finding out ways to unleash the creative potential of their employees, as also their own. The organization necessarily needs to adjust itself to the changing environment and manager should give it desired direction. Being a growing discipline, management theories and practices have been evolving over time. A number of management gurus have been contributing to its development but unfortunately many of them were overshadowed by others in their life time. As is well-known, no theory is a product of a single mind nor can it exist without context. F.W. Taylor, father of scientific management, has been regarded as one of the most influential management thinkers of the twentieth century though Henry. Gantt and Frank and Lillian Gilbreth also contributed in the development of scientific theory. Taylor used his engineering background to develop the theory of scientific management and used it for reducing waste and increasing efficiency in production which benefited not only the business but employees and society in general. According to him scientific management means knowing exactly what you want men to do and seeing that they do it in the best and cheapest way. Max Weber embellished the scientific management theory with his bureaucratic theory and focused on dividing organizations into hierarchies establishing strong lines of authority and control.

The dynamic managers should always keep striving for finding out ways to unleash the creative potential of their employees, as also their own. The organization necessarily needs to adjust itself to the changing environment and manager should give it desired direction.

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In the same way, the essential message of Thomas J ‘Tom’ Peters’ book ‘In Search of Excellence’ (1982, co-author Robert H. Waterman) concentrates on people, customers and action. They found eight fundamental principles for excellence that are still applicable for companies today. The primary idea espoused was that of solving business problems with as little business process overhead as possible and empowering decision-makers at multiple levels of a company. Peters’ book ‘Liberation Management’ (1992) challenges the kind of rigid organization structure that inhibits peoples’ creativity.

In 1990, the idea of Business Process Reengineering (BPR) was given by Michael Hammer and other management thinkers and thereafter, it became very common phenomenon. It is defined as the fundamental rethink and radical redesign of business processes to generate dramatic improvements in critical performance measures – such as cost, quality, service and speed. The idea is that managers should obliterates non-value adding work, rather than using technology for automating existing work. Technology, in general, and more specifically information technology, should be used as an enabler for making non-value adding work obsolete. Michael Hammer’s Reengineering the Corporation: A Manifesto for Business Revolution (1993, co-author James Champy) revolutionized the business world. Information technology has historically played an important role in the reengineering concept. It is considered by some as a major enabler for new forms of working and collaborating within an organization and across organizational borders. Even well-established management thinkers, such as Peter Drucker and Tom Peters, accepted and advocated BPR for achieving success in dynamic world.

In fact, the managers need to consider and evaluate every process and function of organization to make the organization more effective and competitive in the market. Over and over again, the employees need to be motivated as de-motivation sets in almost automatically with the passage of time.

ENVIRONMENT SENSITIVITY: The new generation managers need to be cautious not only about the internal environment of the organization but should also give the attention to the upkeep of nature and environment outside the organization. If a number of United Nations Conferences on Environment and Development or Sustainable Development held at different place are any indications then the future business world will have to attend to environmental needs more vigorously. Thus, management will have to address itself to this issue with more affirmative actions.

ETHICS & SOCIAL RESPONSIBILITIES: The new generation managers shall have to pay close attention to virtues and values that guide people and organizations. As already mentioned, Tom Peters and Waterman are the initial propounders of this concept. The concept advocates that the managers should be sensitive to prevailing culture and evolve a coherent framework within which employees may see appropriate adaptation. They will have to exercise moral courage by placing the value of excellence because it is not always sufficient for the managers to outperform their competitors. The new era of management practices may call for cooperation amongst the competitors in fields like research and development. Thus, ethics and values will have to be adaptive to the new management approach perceived over time.

INTENSIFIED COMPETITION IN INPUT MARKET: With the emerging globalizing trends, the extent of competition has not only intensified in the field of output market, but in the input market as well. Bigger economic fishes are out to control input/resource market as well. The aggressive posture of Reliance in the field of oil & petroleum is one such example, and setting a precedent for other organizations and management. The new era managers will, thus, have to be careful and strategic not only in competition in the output market but need to be vigilant for their sources of inputs as well.

HUMAN RESOURCE DEVELOPMENT: In this era of fast technological advancement, the development and retention of human resources has become a major issue. No organization may dare to strive for excellence in the absence of professionally qualified manpower. The competent employees’ turnover in the companies is reasonably fast and it is one of the ticklish issues for the managers to recruit, develop and retain good employees and seek their betterment. Given the current level of morality shown in the behaviour of business people today – business leaders in particular – what is needed is a change in managerial perspective. A change from the prevailing concern with one’s own well-being – how much one has, or can get for oneself – to include a concern for the well-being of others.

MULTICULTURALISM: In the new business world where the players hail from different countries, different background and also with different culture, the management will have to adopt a multicultural approach. Multiculturalism is a dynamic target as more and more people become conscious of their particular traditions and ties. The 21st century management will have to accommodate all of them in such a way that they work consciously together to achieve the organizational objectives while retaining their individual identities.

QUALITY OF GOODS AND SERVICES: In the globalized world, every management needs to be well versed with Total Quality Management. TQM refers to management methods used to enhance quality and productivity in business organizations. It involves all departments and employees and includes both suppliers and clients / customers. The ideas, as professed by Denning, Joseph Juran and other management gurus in 1950s were applied by Japanese industry that brought dramatic increases in their product quality resulting in their enormous success in exports leading to the spread of quality movement across the world. Every management should strive now to conduct production process in such a way that the product/service produced satisfies the toughest of customers and meets competition. The new era management should take the quality target as moveable and enhance it step by step. The increasing income levels have made the customers much more quality conscious, and they are even willing to pay more provided the product quality is ensured.

CONSISTENCY IN AFTER-SALES RELATIONSHIPS: Strong and lasting relationships can be fruitful by product of quality consciousness and action. After sales relationship is a supplementary as well as complementary freebee with every product that a
customer buys. The importance of this relationship gets magnified with the fact that the modern businessman as well as the customer maintain close informal connection which has increasingly become an important tool in the hands of vibrant management.

**MANAGEMENT INFORMATION SYSTEMS:** The managers of 21st century also need to be well versed in the development of management information systems. It involves applying computer technology, quantitative techniques and administrative skills to the information processing requirements of organizations. MIS, in fact, combines computer technology with management decision-making methods to analyse, design, implement and manage computerized information systems in an organizational environment. This not only helps in planning but is also vital in monitoring and control of all the organizational activities. The managers though shall always have secretarial support but the basic knowledge of developing information systems will take them a long way towards better and scientific management.

In the late 1990s, a lot of literature in the form of books and research articles appeared that dealt with management challenges for 21st century. Peter F. Drucker, father of twentieth century modern management, reviews the seven major assumptions that have been held by experts in the field of management for most of the 20th century, and shows why they are now obsolete. He goes on to give eight new assumptions for the 21st century, ones that are essential for viewing the roles of individuals and management in both profit and not-for-profit organizations. According to him, neither individuals nor organizations can be successful if they stick with the old assumptions just as the horse and carriage can no longer compete with the automobile.

According to Drucker, there is critical difference between a natural science and a social discipline. The physical universe displays natural laws that describe objective reality. Natural laws are constrained by what can be observed, and these laws tend to be stable or change only slowly and incrementally over time. A natural science deals with the behaviour of OBJECTS. But a social discipline, such as management, deals with the behaviour of PEOPLE and HUMAN INSTITUTIONS. The social science has no ‘natural laws’ of this kind. It is, thus, subject to continuous change, and this means that assumptions that were valid yesterday can become invalid and, in deed, totally misleading in no time at all. He identifies the following old assumptions for the social discipline of management. Three Old Assumptions for the Discipline of Management are: (1) Management is Business Management, (2) There is – or there must be – ONE right organization, (3) There is – or there must be – ONE right way to manage people and four Old Assumptions for the Practice of Management are: (4) Technologies, markets and users are given, (5) Management’s scope is legally defined, (6) Management is internally focused, (7) The economy, as defined by national boundaries, is the ‘ecology’ of enterprise and management.

According to Drucker, except for number one, six out of the seven assumptions were close enough to reality to be useful until the early 1980s. However, all are now hopelessly outdated. 'They are now so far removed from actual reality that they are becoming obstacles to the theory and even more serious obstacles to the Practice of Management. Indeed, reality is fast becoming the very opposite of what these assumptions claim it to be.' He identifies the following new assumptions for the social discipline of management:

1. Management is NOT for the profit making business. Management is the specific and distinguishing organ of any and all organizations.
2. There is NOT only one right organization. The right organization is the organization that fits the task.
3. There is NOT one right way to manage people. One does not ‘manage’ people. The task is to lead people. And the goal is to make productive the specific strengths and knowledge of each individual.
4. Technologies and End-Users are NOT fixed and given. Increasingly, neither technology nor end-use is a foundation of management policy. They are limitations. The foundations have to be customer values and customer decisions on the distribution of their disposable income. It is with those that management policy and management strategy increasingly will have to start.
5. Management’s scope is NOT only legally defined. The new assumption on which management, both as a discipline and as a practice, will increasingly have to base itself is that the scope of management is not legal. It has to be operational. It has to embrace the entire process. It has to be focused on results and performance across the entire economic domain.
6. Management’s scope is NOT only politically defined. National boundaries are important primarily as constraints. The practice of management – and by no means for business only – will increasingly have to be defined operationally rather than politically.
7. The inside is NOT the only Management domain. The results of any institution exist ONLY on the outside. Management exists for the sake of institution’s results. It has to start with the intended results and organize the resources of the institution to attain these results. It is the organ that renders the institution, whether business, church, university, hospital or a battered woman’s shelter, capable of producing results outside of itself.
8. Management’s concern and management’s responsibility are everything that affects the performance of the institution and its results – whether inside or outside, whether under the institution’s control or totally beyond it.

Thus, in a nutshell, it may be concluded that the future management styles have to make a major departure from the past management practices. The future managers need to be much more vibrant and dynamic. They need to be particularly active in taking their subordinates along with them and lead them to achieve organizational objectives. They will also have to strike a balance not only with governments and environmentalists but even with their competitors. It is the future mandate and the management will have to ensure that it confronts to this socio-economic mandate.

**References:**


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Professor Fact

Research Clusters

The Dr Shahryar Sorooshian, Senior lecturer, University Malaysia Pahang has created research clusters, that bring together a eminent group of research with common academic interests, allowing for meaningful ways to promote interdisciplinary and community collaboration, and strengthen high-impact research. The goal is to support the expansion of scholarship and innovative research by identifying and developing existing areas of excellence within the University Malaysia Pahang, which include aging, behavior, health, society, social environment, and management as well as provide a framework for research and training at the doctoral level. Each cluster receives significant funding in combination with external support to provide the team a lake of shared resources that can be used for research, teaching and scholarly dialogue. In that Journal of Management and Science-JMS has been dedicated to this research cluster with Professor Dr Shahryar Sorooshian which is publishing the research framework.
Project Analysis: A Research Gap

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ABSTRACT: This Paper is a short communication in the form of a research proposal to highlight the gap of research in project management area. This study focuses on construction projects and suggests research objectives for further studies, with a research roadmap for younger researchers

Keywords: project; Construction industry; Gap of research; Delay source

INTRODUCTION

The roots of construction industry can be traced back to the times when human beings tried to build their own shelters in the ancient times. The construction industry is regarded as a vivid indicator of the economy conditions in each country. The considerable impact of this industry on the overall health of the economy makes it an interesting and crucial area of interest for researchers, economists, and policy-makers alike. The current research aims to present an analysis on the causes of failure of the construction project’s schedules. A construction project, similar to any other project, is expected to be completed in a certain time that is specified ahead of starting the physical task of the project during the early phases. A construction project involves a considerable amount of funding that goes to staff, machinery and the capital investment therefore any delay in the completion time will result in huge losses. The delays can impact other parties involved in the construction projects. Some of the main effects of delays can be named as time overrun, cost overrun, disputes between different parties, settlements, lawsuits, and total abandonment [1,2].

EXPLORE THE PROBLEM

The construction companies in many countries around the world experience significant delays. In the United Arab Emirates, a study by Faridi and El-Sayegh [3] revealed that 50% of construction projects encounter delays. In India, a study conducted by the Infrastructure and Project Monitoring Division of the Ministry of Statistics and Program Implementation in 2004 reported that out of 646 central sector projects costing about $50 trillion, approximately 40% are behind schedule, with delays ranging from 1 to 252 months [4]. In the United Kingdom (U.K.), a report by Building Cost Information Service (BCIS) found that nearly 40% of all studied projects had overrun the contract period[5]. In Saudi Arabia, Assaf and Al-Hejji [6] found that only 30% of construction projects were completed within the scheduled completion dates and that the average time overrun was between 10% and 30%. About 17.3% (of 417 government contract projects) in Malaysia were considered sick (more than 3 months of delay or abandoned) [2]. Many cases for delay in construction industry also have been argued in UAE [7] and Jordan [8]. The available literature and studies that have been performed all around the world indicate that the delays occurring in a project result in an increase in the cost of the project, which makes it difficult to handle the project. [9,10].

In order to be able to prevent delays or decrease them, the construction project managers have to discover the main causes of these delays and also find the proper strategies to deal with them and reduce their effects. Generally, the aim of project management is to facilitate the projects to reach the predefined goals of with employing knowledge, skills, tools and techniques. Therefore, project management is only could be achieved by a combination of management through different levels of project ranging from the early phases of initializing, planning and designing to execution phases and supervisory and control tasks  [11,12].

The delays in projects are happened as a result of malfunctions in the employed project management strategies. The critical issue of project delays in the construction industry is not limited to a certain economy or country and generally happens in all economies globally. It has been extensively reported in the literature and the existing surveys that proper performance of the construction industry is vital for the overall development of the economy [13]. Therefore, it is necessary to establish comprehensive understandings of the causes of delays in this industry in order to be able to empower construction industry to reduce delays through managing the available sources. It could only be achieved when all the crucial factors that are involved in delaying the construction projects could be identified, risk based ranked, and contorted. The parties that are responsible for these causes should also be recognized so that the reasons of delays could be traced in different stages of the project and within any of the involved parties.

CONCLUSION AND RESEARCH SUGGESTION

There has been a growing interest among researchers and experts in better understanding of the roots and causes of the failures in construction projects. Moreover, it is essential for the project managers to have a comprehensive understanding of the project setbacks [14]. Based on the literature studies, it can be inferred that the earlier studies concentrated on either the causes of delay or the effects. However, some studies have alluded to the probable link between the causes and effects of delays without a systematic analysis. With this research, all the delay factors will be categorized into fundamental groups based on their similarities and differences. On the contrary to the available literature, in this research, we take an integrated approach and attempt to link the causes and the effects of delays in construction industry through a systematic analysis. Furthermore, with modification of available risk analysis methods, a
reliability analysis will be conducted to test and benchmark the industry. This research also offers better understanding among all parties involved in the construction project to be aware of the delay factors and therefore enhance their performance in order to reach their predefined goals more efficiently.

Based on the problem statement and the gaps in the available literature, the following research objectives are set for further studies.

- To identify delay modes in construction projects and to develop a systematic framework to categorize them.
- To rank delay modes, and to analyze reliability of the construction industry.

In order to investigate the concern of project management issues in construction industry, a semi structure interviews session and questionnaire survey is suggested for further studies. Interview study will focus on respondent’s opinion, experience and knowledge of ergonomics in new product and production design. The questionnaire questions concerns to consideration the influences of delay sources.

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Supply Chain Project Studies

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ABSTRACT: This article is a mini review paper to explore recent studies in supply chain management for a class activity in Operations management tutorial under University Malaysia Pahang Undergraduate Programs. In this paper a team of students as their tutorial work studied researches to find what the role of manager of chain of suppliers is.

Keywords: Supply Chain, Management; Literature review

INTRODUCTION
Nowadays, the fierce competition in today’s global markets and introduction about the new products with shorter life cycles and also the heightened expectations of customers have forced business to invest in and focus attention on their supply chain. This, together with continuing advances in communications and transportation technologies such as mobile communication and internet has motivated the continuous evolution of the supply chain and the techniques how to manage it effectively. First of all, the definition of supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities to the right locations and at the right time in order to minimize system wide costs while satisfying service level requirements. This definition will leads to several observations. First observation is supply chain management takes into consideration every facility that has an impact on cost and plays a role in making the product conform to customer requirements. Secondly, the objective of supply chain management is to be efficient and cost-effective across the entire system of total system wide costs from transportation and distribution to inventories of raw materials, work in process and finished goods are to be minimized. Last observation is the supply chain management always revolves around efficient integration of suppliers, manufacturers, warehouses, and stores. This thing will make it encompasses the firm’s activities at many levels which is from the strategic level through the tactical to the operational level. Other than that, some supply chains are simple, while others are rather complicated. The complexity of the supply chain will vary with the size of the business and the intricacy and numbers of items that are manufactured. For the additional information, simple supply chain is made up of several elements that are linked by the movement of products along it. The supply chain starts and ends with the customer. It also has three levels of activities that different parts of the company will focus on strategic, tactical and operational.

REVIEW
The paper tells us the specific requirements towards cooperative planning in the centre of any supply network that is formed by a pair of manufacturer’s authority and supplier who have asymmetric information on forecast on demand and costs, in each specific cases. Then a new way that were suggested to explore this problem of supply-chain management is by means of the apparatus of mechanism design. The results of the analysis in some specific properties that are provable for efficiency and truthfulness, and shows the impossibility or absurdity of fair cost and profit sharing. Next, design some principles towards a payment scheme that are devised that provide incentive for the partners to cooperate in order to minimize the costs. This payment can be assumed as the price for a flexible supply service. For instance, the generic framework is immediately with two particular cooperative supply mechanisms. For instance, Tenaga Nasional Berhad. They give salary to their employee based on their performances including the soft skills. [1]

Supply chain was been considered in which a producer supplies a fresh products to a distant market through a third-party logistics (3PL) provider, where a distributor purchases and sells it to their customers. The product is easily damaged. Both quantity and quality of which may decline during the transportation processes. The demand of the market is random, directly proportional to the selling price as well as the freshness of the product. We obtain the best decisions for the three supply chain members, including the transportation fee of the third-party logistics provider, the producer’s shipping quantity and wholesale price, and the distributor’s purchasing quantity and retail price. We find that the presence of the 3PL provider in the supply chain has a specific impact on the performance. We propose an incentive scheme to make the supply chain consistent. The scheme consists of two contracts, including a wholesale-market clearance (WMC) contract between the producer and the distributor, and a wholesale-price-discount sharing (WDS) contract between the producer and the 3PL provider. We show that the contracts that had been proposed can eliminate the two sources of “double marginalization” that exist in the three-tier supply chain, and encourage the three parties to act in a coordinated and arranged way. As example, the McDonalds company. They have made some black and white agreements with their suppliers about the price and condition of the salads, chickens, and burger breads according to customer's wants and the global prices of raw materials. [2]

This study designates Green Supply Chain Management (GSCM) strategies to effective direct business functions and activities in the electronics industry. Enterprises conduct scanning to the environment to understand the external environment and internal functions, a successful strategy identifies unique firm-owned resources and change them into capabilities. This study of supply-chain management proposes a network to declare the levels of managerial and firm-related content. It derives four business functions from product life cycle management which are design, purchasing, manufacturing, and marketing and service—and associates their related activities with “greenness”. These functions and the activities are the network clusters and its elements in an analytic network process (ANP) model with dependent relations. A thorough procedure solves complex GSCM strategy-selection problems and evaluates the most
important activity in each business function. A case study takes a leading Taiwanese electronics company to identify the proposed procedure’s stability. [3]

Recently, the competition in the global construction market has increased. Thus, several research efforts have focused on the application technology (IT) as a way to improve the process of integration of the construction supply-chain management (CSCM). They said that it will be clearer when we use visual representation because this can provides effective tools for monitoring resources in the CSCM. In order to support this objective, this paper consolidates the building information modeling (BIM) and geographic information system into a unique system that can make the supply-chain status always on the track. It also can provide warning signal in order to making sure the delivery of materials. The term ‘supply-chain’ used in this article is to define the stages through overall construction resources which are material, equipment and personnel. Supply-chain in construction is more concerned to the planning and directing the discrete quantities of materials to the construction site. If we take a closer look to the supply-chain management in construction sectors, it will show the considerable amount of wasted product is rooted in poor management of the material supply-chain such as delivery services, inventory, and communications. In this case, the use of IT is one of the way to achieve better logistics processes and avoiding delay. For instance, Pos Malaysia. They provide their customers with tracking number of their posted products. This is beneficial for the customers to key in the codes to Pos Malaysia website to check the delivery status and where the geographical positions of their posted things. [4]

Consumer goods industry is a highly competitive field, and globalization and economic integration have a tremendous impact on the supply chain operation of consumer goods industry. Based on this, introduces the problems and challenges from channel demand chain, put forwards demand oriented supply chain collaborative plan and its value, and then builds the framework of the collaborative plan, and briefly describes the characteristics of various activities and internal relationship between each other. Based on this, a case is introduced to be analyzed empirically. At last, summarizes the key elements of successfully implementing the collaborative plan. For example, KFC Holdings make cooperation with Region Food Industries Sdn Bhd (LIFE) as a major supplier of chilli sauce, thai sauce, and tomato sauce are all the KFC outlets throughout Malaysia. [5]

The formulation and implementation of effective coordination strategy among members is key to promote sustainable development of Green Supply Chain (GSC). Combining with the specific situation and establishes the product utility diversity model and supply chain revenue model based on custom market demand caused by green products’ utility diversity, and examines the coordination between manufactures and its upstream suppliers under Stackelberg game and cooperative decision-making respectively, resulting to two pricing strategies as well as market conditions for GSC to operate regularly. In addition, formulating coordination pricing strategy of the wholesale price based on cooperative decision-making strategy achieves the members' Stackelberg equilibrium profits Pareto improvement. We conclude the results of crucial significances for collaboration of members who promote the initial GSC and for the development of green market. IKEA will be ensure that the suppliers of furniture and wood products that deal with a stick that is not derived from an endangered tree species. This is based approach IKEA Green ‘was practiced as part of its corporate culture. IKEA believes that its green practices in supply chain management not only helps protect the environment but also ensure long-term supply of raw materials. [6]

Besides that, explore the relationship between supply chain management strategy and chain management practices on supply chain performance. The main tools of data collection instrument used was a questionnaire which was administrated to a total sample of 200 managers are classified by job title and respondents are also classified by their job functions are corporate executive, purchasing, manufacturing/production, distribution/logistic, SCM, transportation, material, and operation from Malaysia manufacturing industry. The response rate was 62% while 51% was usable questionnaires. Sample selection was based on convenience sampling. The data were analyzed using mean, standard deviation and correlation between independent and dependent variables. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The finding showed that supply chain management practices have a significant relationship with supply chain performance statically. However, supply chain management strategy is a weak predictor of supply chain management performance. [7]

Furthermore, investigate the relationship between organizational practices and supply chain agility. Data collection instrument used was a questionnaire which was administrated to executive officers, directors, presidents, vice presidents, managers and senior staff from manufacturing firms in Malaysia. In order to contact of respondent in efficient and cost effective manner, it was decide to distribute questionnaires to respondents through mail. The response rate was 70% while 63% was usable questionnaires. Sample selection was based on convenience sampling. The data were analyzed using mean, standard deviation and correlation between independent and dependent variables. The analyses involved statistical methods such as reliability and validity tests and multiple regressions. The finding showed that supply organizational practices have a significant relationship with supply chain agility. This also shows that supporting technology moderate the relationship between organizational practices and supply agility do exist. [8]

Discussed on the managerial and research implications of sustainable supply chain management. We analyzed current researches about the sustainability and its introduction into the supply chain. And then, based on the necessity and requirements of sustainable supply chain management, we argued about what kind of strategies the company should conduct to obtain the sustainability in its supply chain. Finally, from the viewpoint of the company having the not-sustainable supply chain, we established the framework for strategy development to construct the sustainable supply chain, which could help the company in making a practical application, as well as could be suggested as research directions of future works to support it. For example, the UDA HOLDINGS is a well known company in the field of property management, construction, malls, hotels and resorts. The company of Uda Holdings over managing the efficient production and maintaining good relationships with suppliers of raw materials. Therefore, good management with employees and suppliers can further increasing company profits. [9]
Supply chain management is the active management activities to maximize customer value and achieve a sustainable competitive advantage. It represents a conscious effort by the supply chain firms to develop and run supply chains in the most effective & efficient ways possible. It also cover everything from product development, sourcing, production, and logistics, as well as the information systems needed to coordinate these activities. The organizations that make up the supply chain are “linked” together through physical flows and information flows. Physical flows involve the transformation, movement, and storage of goods and materials. They are the most visible piece of the supply chain. Information flows allow the various supply chain partners to coordinate their long-term plans, and to control the day-to-day flow of goods and material up and down the supply chain. [10]

Supply Chain design and operational decisions need energy to keep the products flow to the customer. It is quite challenging to determine the energy consumption and to understand the impact of design and operational decisions on the energy consumption. There are a few simulation used in this problem. Firstly, Hierarchical simulation. It is base approach for estimate the energy consumption to keep products flowing through supply chain. Next is System Dynamics Simulation. It is used at a high abstraction level to understand the major factors that may affect the energy consumption. Discrete Event Simulation used to delve down in details for evaluating the critical stages in the supply chain. [11]

This day, we can use technology such as internet as supply chain. It is call virtual supply chain. Virtual supply management does no longer require physical proximity. It can be manage or control from many places by other people. We can use internet to communicate order release against blanket purchase order. For example, online shopping. We just search the things that we want to buy in the internet, then we order it after that the supplier will send the things to us. It will removes fundamental constraints concerning place, time and human observation. The other example is Kentucky Fried Chicken restaurant (KFC). When restaurant out of stock for example chicken, the manager will order it from supplier through virtualization. Then the supplier will reply when they will send the stock. So simple and easy. [12]

With the development of economy and information technology, the competition between enterprises is decrease and the competition between supply chains is increase. Reducing total cost cannot satisfy the customer demands. Using the system engineering concepts, the system dynamics models of traditional supply chain and leagile supply chain are built. Leagile supply chain is a new conception that proposed in context of customer demand. The advantages of leagile supply chain is inventory, quick response to market demand and shorten the length of supply chain. The advantages of leagile supply chain can be shown through comparing the simulation results of this two kinds of supply chain. We can determine the relationship among effects factors of leagile supply chain and observe the visual dynamics change of supply chain by running the simulation model. Thus, this results can provide decisions support to enterprise leagile supply chain. The advantages of leagile supply chain are inventory, quick response to market demand and shorten the length of supply chain. [13]

The key competence in manufacturing companies is the capability to concurrently design the product and supply chain. This competence is still underdeveloped in industry. The lack of convergence of the methodologies for concurrent product and supply chain design in the research community has caused the research not able to fill this industrial capability gap. Moreover, a dominant and practical methodology in concurrent product and supply chain design in the industries has not yet emerged. Uncertain of the complexity and effort of concurrent design industry has been reluctant in adapting concurrent design methodologies at all or to the full extent. [14]

The suitability of Complex Adaptive System (CAS) modelling for making complexity-optimizing supply chain decisions is discussed on example of semiconductor supply chain. CAS are systems far from equilibrium, characterized by a large number of interacting and evolving agents, who adapt and learn and thus could be able to solve the complexity dilemma. A promising approach for managing supply chain complexity is the interpretation of a supply chain as CAS. The factors that led to a global dispersion of supply chain is new global market, lower manufacturing costs and sourcing activities. Scientists and business experts agree that the complexity along the supply chain is high and has increased even further in recent years. The mounting complexity products, processes and companies has been fuelled by trends such as globalization, diversity of variants and declining manufacturing depth along with ever shorter product life cycles.[15]

Energy source supply chain is the new research concern in supply chain management. There are some factors that that make energy sources supply chain management to success which is the supply chain coordination leads to increased information flow and reduced uncertainty. The study of energy sources supply chain consisting of one energy source vendor(SV) and one energy sources integration provider(SIP). The information sharing coordination of energy sources supply chain can be develop between SV And SIP. Energy sources supply chain is very important and necessary for improvement and minimization of value leakage. The key that approach to achieve supply chain coordination is information coordination. The interaction between SV and SIP may be different if there are multiple SIP’s competing for the same customer. [16]

Supply chain management is the major concern on process excellence from organizational points of view. The efficiency and effectiveness of supply chain management can be increased by the application of radio frequency identification (RFID) technology and lean production. A journal had stated that: “numerous organizations are planning to, or have already adopted RFID in their operations in order to take advantage of a more automated and efficient business process" [17]. Its shows that, RFID had been implemented by many company or organization in this world in an effort to gain more profits. The information technology system in RFID technology can help a company to achieve better supply chain planning and management through their accurate data. Thus, this is most probably the reason of many companies try to apply this technology. Pigni and Ravarini had stated that RFID technology integration improved the system business process and provide an inter-organizational information system that promoted the efficiency and effectiveness of the entire supply chain. The effect of RFID technology gives a big impact on effectiveness and efficiency supply chain of the organization or firms. [17]
Lean production also give a big contribution in effectiveness of supply chain. It was introduced by Toyota and the name at that time is “Toyota production system (TPS)” or “just-in-time (JIT)”. Its aims to reduce waste, to improve their productions by using a continuous improvement approaches. Thus, lean production can reduce waste in human effort, inventory, and time for marketing. This can be a good tools for a company to develop from time to time and it have been stated by So and Sun. They emphasized that lean production was proved to be a tools for a company to develop continuously. By becoming a lean enterprise, a company or manufacturer can improve throughout, reduce cost and deliver shipment in shorter time. VSM technique was developed by the lean production. It help to rearrange manufacturing system according to lean perspective. Thus, supply chain of the manufacturer will become more effective with all this approach. Besides, an experiment that had been carry out by researcher showed that total operation time can be saved by 81% from current stages to future stages with the integration of RFID and lean production. [17]

In order to increase the efficiency of supply chain, an environmental aspect should be taken so that our environment will be conserved. Process to produces a product may need a raw material from our environment such as our forest. So, wasting sources might be happen in the process to produce a product. From enterprises’ perspective, the most important way to manage environment is to develop more competitive advantages through improvement of environmental management ability. [18] Thus, green supply chain management is the way.

Green supply chain aims to optimize the resources allocation and achieve environmental compatibility. It need to change the idea “treatment after pollution” and highlight the concept of “reduction of pollution at source, prevention first, treatment second”, to the design of product and purchase stages, full consideration shall be made about its impact on environment. [18] This give meaning that, a firm or company that want to buy the source should apply the concept and be more friendly to environment.

Green supply chain management give its own benefit better than traditional supply chain. If they do traditionally, main target for the enterprise is to pursue maximal economics benefit without take the responsibility at the expense of external interest. But, green supply chain management take both consideration. If all companies apply the concept of green supply chain, it means that, they have consciousness of environmental aspect. This importance because one day all the sources will be use up. All company can practicing economic activities in line with 3R principle, namely Reduce, Reuse and Recycle. Reduce means reducing the quantity of substance in the process of production. Besides, reuse involved in extending the time intensity of product and service. While, recycle highlight on the regeneration of renewable resources after use. [18]

As a conclusion, that why green supply chain management should be given more priority to all companies just to apply in their supply chain management. In exciting earning a big profit from any business, all companies and firms should take consideration to the environmental aspect because this planet is belong to all human being.

The concept of supply chain is about managing coordinated information and material flows, plant operations, and logistics. It provides flexibility and agility in responding to consumer demand shifts without cost overlays in resource utilization. The fundamental premise of this philosophy is; synchronization among multiple autonomous business entities represented in it. That is, improved coordination within and between various supply-chain members. Increased coordination can lead to reduction in lead times and costs, alignment of interdependent decision-making processes, and improvement in the overall performance of each member as well as the supply chain. Describes architecture to create the appropriate structure, install proper controls, and implement principles of optimization to synchronize the supply chain. A supply-chain model based on a collaborative system approach is illustrated utilizing the example of the textile industry. [19]

Supply chain management is built on the principles of partnerships and the development and use of the connections that exist between the links of the chain to provide information that will increase the efficiency of all members in the chain. Success stories abound describing lower costs, shorter lead times and increased customer service. Collaborative forecasting applies supply chain management concepts to the forecasting function and uses available information and technology to force a shift from independent, forecasted demand to dependent, known demand. Eventually, the future of forecasting may evolve to the point where forecasting is not even necessary. Demand information will be supplied completely by supply chain partners and the need to predict demand will be eliminated.[20]

CONCLUSION

Finally, as the conclusion, supply chain has three levels of activities that different parts of the company will focus on which is strategic, tactical and operational. Thus, the definition also will lead to the several observations. Other than that, the supply chain is made up of several elements that are linked by the movement of products along it. On top of that, the supply chain also will starts and will ends with the customer. Furthermore, the benefits of supply chain management will be obtainable in four main thing. First main is supplier and inventory management. In this main, the benefits that will facilitate are it will balance service levels with stocking levels, gain company-wide, real inventory visibility, forecast with accuracy and predictability and also reduce lost sales due to out of stock products. The next main is business management, in this main, it will gain visibility all areas of your company and make faster, better decisions with real time information. The third main is customer satisfaction. For this main, the benefits are improve quality of customer inquiry responses, discover customer insights, preferences and trends and it also will identify most profitable customers. The last main is enable your business growth. Through this main it will integrate seamlessly with best in class technologies, open access to database for desired use and also extend capabilities without major system changes. Lastly, the thing that can be understand clearly is the supply chain acts as the main and important role in the company and some business.

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Research consultation and method teaching was with the second and third author based on their research area. This study is supported by University Malaysia Pahang research grant (RUD130375).

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Design in Operational Projects

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ABSTRACT: This paper is a brief review article to study current studies in good and service design, for a class activity in Operations management tutorial under University Malaysia Pahang Undergraduate Programs. In this paper a team of students as their tutorial work studied researches to find what the role of manager of good and service design is. Keywords: goods and services, Operations Management; Literature review

INTRODUCTION
Good and services are interrelated. Good is a thing that fulfil the human requirement and provide effectiveness for human. While service design is an activities which contain components of a service that will be carry out by planner and organiser in order to enhance its quality and the connection between customer and service provider. Good can be described as raw materials and primary product. While service design is a design to satisfy the needs of customers or participants. In early stage, the activity of service design was considered as part of the domain of marketing and management disciplines. According to Shostack, design process can be documented and codified. After a few years, Prof. Dr. Michael Erlhoff Klon International School of Design (KISD) who is the person firstly introduce service design as a design discipline. Engine which is first service design consultancy opened for business at London in 2000. The similarity between good and service design are both also a type of output. All good are tangible while service design are intangible. Specification and construction of technologically networked social is a characteristic of service design which provide precious capacity action to a specific customer. Goods can be resold and inventory while service are product that cannot be resell and hard to inventory. Goods are transportable products whereas services are products that cannot be transported.

REVIEW
From the articles, we know that creativity and innovative design is important in cultural production systems. Design is a business-facing type of creative industry that differs in important ways from other types of cultural industries. Creativity and innovative in design generally are neglected because the others aspect get more attention such as place-based creative inspiration. Design innovation needs the combination of a wide range of different types of knowledge. Design emerges from interactions between different sites that synthesize and recombine knowledge so as to produce emergent effects and new designs. Actually, relations with clients, and firm routines and competences, are much more important to design innovation than inter-firm co-operation or the local cultural environment. [1]

There are two logics or mindsets about transition from goods to service. Firstly is “good dominant logic”, views services in term of a type of intangible good and implies that goods production and distribution practices should be modified to deal with the differences between tangible goods and service. Second logic is “service dominant logic” which says that service is a process of using ones resources for the benefit of and in conjunction with another party so that the fundamental purpose of economic exchange and implies the need for a revised, service-driven framework for all of marketing. [2]

Most of the engineers focus on the design of physical products and on their interactions with others object, so technical services are not considered very early during the design process. Some product -service system (PSS) methodologies still exist but are focused on the system and do not sufficiently specify engineering product criteria. Indeed, to achieve the development of consistent PSS, a methodology is required to support engineering designers during the development process. The designers must consider carefully and early in the design phase the interactions between those elements. The aim of the proposed methodology is to provide engineering designer with technical engineering specifications in relation with the whole system's requirements as precise as possible for the development of the physical objects involved in those systems. [3]

Industrial Product Service System (IPSS) represents a new solution oriented approach for delivering value in use to the customer during the whole life cycle of product which specified by integrated product and service shares. Article which is including motivation and definition will be launched to describe the general approach of Industrial Product Service System. The incorporated paradigm shift from leadership in technology to leadership in use enables innovative business models. These business model will be show how a flexible solution space arises. Besides that, Industrial Product Service Systems has broad overview of the scientific issues which is complemented by exemplary research result regarding the delivery phrase, like operation resource planning and modular organization. [4]

Moreover, the enhancing of ecological and economical performance of industrial products are aim by the technical services. The products and services need to be integrated so it can be systematically exploit in their potentials for both manufactures and industrial customers. The resulting of Product-Service Systems (PSS) can make it possible for the customer life cycle that defined as the combination of products and services in an extended value creation network. The designed integrated of product and service components of the PSS have to be done in order to exploit their full potentials. Therefore, the proposed methods include the implementation of PSS design process by combining, selecting and adapting appropriate processing module of existing the product and service design process. [5]
In another point of view, product family design and platform-based product actually has a clear development in recent years. We found that a comprehensive review of the state-of-the-art research in this field. A decision framework is introduced to reveal a overall view of product family design and platform-based product development, including both frontend and backend issues. The review is organized according to various topics in relation to product families, including fundamental issues and definitions, product portfolio and product family positioning, platform-based product family design, manufacturing and production and supply chain management. There are also a major challenges and future research directions investigated. [6]

Moreover, this paper believes that can gives incentives to provide goods that are non-excludable along socials or geographic links. First, networks can contribute to specialization in public good provision. There is an equilibrium in every social network where some individuals will contribute and others will free ride. Second, specialization can benefit society as a whole through outcome arises when, contributors are linked, collectively to many agents. Lastly, a new link will increases the ability of access to public goods, but it also will increases the ability of access to public goods, but it also will reduce individual incentives to contribute. As a conclusion, overall welfare can be higher when there are a holes in a network. [7]

Nowadays, the increasing requirement for innovative services forces traditional product-oriented to find the potentials and strategic importance of services. Companies can ensure their market position thus can achieve economical success through innovative service. Due to this, innovative service becomes an important part to systemize service design, development and management process as well as to tightly integrate products and services. So, service engineering (SE) and product service systems (PSS) are presented. [8]

Service engineering (SE) is finding the new opportunities to innovate and design the service operations and processes of the new services-based economy. Introduction to Service Engineering provides the ways and information a service engineer needs to fulfill this critical new role. Product service systems (PSS) is motivated to satisfy customers' need, it is also a strategies to face today's competitive business environment. The PSS design is still in initial stages of development and substantial research is required to develop a practical PSS design methodology. [9]

Based on the planned obsolescence, economies of scale, and new products growing demand, the classical market economy has provided a basis for emergence of throwaway way that is clearly unsustainable. The so-called circular economy which is an alternative model was based on optimised life span of a product, extended services, and remanufacturing business. For the aim of the paper is to give an understanding about the intricacy of product durability dissertation from economic and environmental perspectives and also from different stakeholder perspectives and to discuss the innovative strategies to achieve the durability of products by improving value of the durable products and maximising utilisation rate for users. [10]

The research design on Western-European firms is accomplish as research methodology. The study on this can answers the following three strategic questions: what level of performance can be achieved through service strategies? What are the typical service strategies exist that enable firms to transfer from products to services? And what are the appropriate alignment of service strategies with organizational design and external environment? Besides, what have found that after-sales service provider faces with a high intensity of competition and their customers are invest in the low-priced of products. The development partners' customers are expect the specific solutions for the operating processes and they support providers' market consists of customers that looking for the outstanding quality of a product. Through the research limitations and implications, the study only focused on manufacturing firms in business-to-business markets. The originality and the value of both managers and scholars are tend to be somewhat vague to moving along the transition line from products to services by suggesting strategies. This shown that identifies specific strategies enable the manufacturing companies shift their position on transition line. Therefore, the concentrating on the right triggers are assists by the managers for implementing service strategy. [11]

For instance, this article was introduced the concept of the service delivery network (SDN). It defined as two organizations or more that in the eyes of customers that are responsible for providing a connection to the overall service experience. This framework for understanding response to appeals that embedded in a series of vector Service Encounter Experience Clients with having the complementary providers as a part of journey in order to achieve their goals. Using an SDN perspective show significant different challenges for managers and providing a research opportunities on establish service concepts for challenging the current view. All the managers should recognize that to better serve the customers. They need to understand about the role they may play in customer-defined service journey and always be ready to coordinate their activities with the complementary providers. The Participation in helping build and manage SDN for customers, becomes a central challenge, or the understanding how they can fit into customer’s self-designed SDN, often requiring companies to develop a new set of features. The SDN also challenges the way that anchored in the dyadic view which are many core concepts within the service research. For future inquiry, the considerable opportunity has provided. A series of research questions we present, inspired by the SDN and it organized into many categories including collaborative networks and building cooperative, customer relationship management, systems thinking, building capabilities, managing service failure and recovery, customer-to-customer interactions and so on. [12]

This paper revisits the product, service distinction from an institutional perspective. Many of the literature in marketing and management has concentrate on the intrinsic characteristic of services with a view to derive implications for the management of service based firms. Producer-user interactions is nature and get dependent from a product or a service. Besides that, we also will develop the argument that services play a main role in manufacturing by increasing it and explore the reasons that underpin this trend. [13]

This article examines the link between the service operations and a supplier’s marketing and also its business customers’ subsequent re-patronage behaviour. We have developed a dynamic model of service contract renewal for an individual firm. The contract level
recognizing the interdependence among service renewal decisions due to the company purchased from the same suppliers multiple contracts. The decision to renew the service contract is modelled as a function of price and quality of service which is measured by the supplier’s service operations indicators over time. The study is investigates how the average level of service, change in the level of service (especially extreme outcomes), and regular service delivery affect the firms’ service contract renewal decisions by integrating the service providers of business longitudinal data. This study context is support services high-tech systems in enterprise market in the United Kingdom and Germany, where services business indicators over time is usually skewed distribution. The firm behaviour is represented in binary choice model contract level and it was estimated as a binary response model with complementary log-log link function combine random intercepts. The study shows that after controlling for the average level of service, a firm has a few extremely beneficial experiences for a given service contract is more likely to update the service contract. Overall, the study suggests that customer retention model should comprise the variability, extent, and timing for over time the contract / product level of service delivery providers. [14]

Besides that, supply chain management and marketing have been remove from models and focused on goods to more general models. Besides that, the purposes associated with partnership, value networks, service provision and value creation. Service dominant logic is one of this movement has been captured. Supply chain management apply service dominant logic in terms of service provision. In which goods are seen as service distribution or provisioning mechanisms, explore and elaborate on the concept of a value network. Other than that, model of the firm will develop as an essential service provisioning agent in a complex and adaptive value network. Lastly research and managerial opportunities are also explore. [15]

Research found that nowadays, the turbulent external environment have strongly affect the on public service performance. Lack of consensus on retaining the turbulence problem or after existing organizational structure make the problem become worst. Therefore, the first comprehensive empirical analysis is supplied to test the links between turbulence stability of structure, and performance of public organizations so that it is compounded by internal organizational change. As an overall, to improve public service performance, the bad effects of volatility in the external environment must be lighten. [16]

For improving the performance or productivity of an organization, the emerging field of service science is needed to draw on multiple disciplines and practices. There is some Human – Computer Interaction (HCI) researchers and practitioners which indicate as services that provide elements of interest to service science. For example “the user centred mind-set and techniques” with “the concepts and frameworks applicable to finding out the nature and services”. Both of the elements are considered long’s work on the conception for HCI. It stands as important antecedent to a work which link to various strands of servicer research and can be used to provide high-level integrative models of service systems. The main concepts of UCL is domain, task and structures and attitude. These enable us to relate systematically different streams of service research and provided more information. [17]

Moreover, value for money in a project depends crucially on performance monitoring. The performance monitoring mechanism role must be examined and the effectiveness of performance monitoring and output specification must be assessed to ensure that a project can operate successfully. Besides that, the “spirit of partnership” and exchange for minor contract variations in the output specification are the evidence to improve the performance or productivity of an organization. Both the public and private sectors are experience a learning process which will lead to a big improvement on organization for the future. [18]

Furthermore, Gainesville develop a mobility plan prototype in order to measure critical mass of variables that must be present to attract non-motorized trips. The prototype incorporated level - of - service (LOS) performance to measure for the bicycle and pedestrian facilities. Pedestrian LOS criteria and the bicycle LOS measurement are similar but the different is pedestrian LOS incorporate specific pedestrian features. The scoring system designed for evaluating mutually exclusive or inclusive to determine all possible combination of points. Besides that, the methodology is applicable for corridor evaluation on arterial and collector roadway in urban or suburban area and the result generally corresponded to user perceptions of the facilities. LOS evaluation is useful for congestion management system to develop project recommendation and priorities, in concurrency and long – range transportation planning. [19]

To improve the performance or productivity of an organization, we might use meta- analysis to determine the effect size and examine whether the effects are longer for all the situations. From our findings, we can offer suggestions intended to shape research practice. [20]

CONCLUSION
In a nutshell, there are many ways to improve the performance or productivity of organizations. For instance, good and service design, quality of product, location, human resource, maintenance, layout design, inventory, supply – chain management and so on. In all of that, our group believed that good and service design is the best way to improve the performance or productivity of organizations. This had been proven from the summarized article above. We strongly agree that good product and effective service which provide to customers will improve the performance or productivity of organizations.

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INTRODUCTION

Human resources are vital for an organization. Its aim to ensure the organizational obtains and retains the skilled, committed and well-motivated workforce it need which it outcome are access and satisfy future people needs and to develop the inherent capacities of people’s potential and employability. However, the organization must provide learning and continuous development opportunities to their works. For instance, the involve operation of recruitment and selection procedures. Productivity can improve through strategic of Human resources. Strategy is the critical factor that affects firm Performance, having a long-term focus, plans that involve the top executives or board of directors of the firm and a general framework that provides a perspective for selecting specific policies and procedures. Strategy Human Resources Management represent a relatively new transformation in the field of human resource management which is concerned with the role human resource management systems play in firm performance, particularly focusing on the alignment of human resources. Therefore, strategic human resources may increase performance in different area such as productivity, quality and financial performance.

There are many strategic human resource based on organization. However, there are five strategies that we highlighted in this task. They are competent manager, goal setting, performance measurement, coaching, and rewards. These strategic are the basics strategic which give boost performance to organizations. Therefore, we choose this topic to improve our understanding towards human resources in improving productivity.

REVIEW

All organization needs managers who can handle and control the managerial function. Manager can be define as a person responsible for planning and leading the work of a group of individuals, monitoring their work, and taking corrective action when necessary. A manager requires a subtle blend of interpersonal skills and personal credibility, a deep understanding of the political. They also must know what his/her responsibilities, organization goal, duties and who workers to help perform effectively, the culture and environment of company. The role a manager is very important due to motivate their employees and helping them to recognize approaches to identify solution, ensure they take seriously of their responsibilities, keeps information, healthy environment and coaching. [1]

Next, a manager must be knowledgeable, skills and ability (KSA’s) which known as competent manager. According to oxford dictionary, competent define as having necessary skill or knowledge to do something successfully. This is because; the work environment must be in the learning mode which can improve the quality of his/her subordinate. “For a business to strengthen its position on the market, its managers should become skillful at helping their subordinates to set and achieve specific and measurable goals with realistic deadlines and clear expectations. Managers should also mentor employees through challenges, helping them grow and develop new skills. Successful managers have to possess a complex amalgamation of technical, functional, cultural, social, and political skills. As globalization becomes the normative strategy for organizations, one of the critical success factors centers on amassing an adequate number of competent global managers to implement global strategies. Therefore, a manager must rich of knowledge, amalgam with it, have skill, abilities and others characteristic to lead his employees’ efficiently. [2][3]

In the other hands, manager must communicate with the staff which important to inform employees up to date with the issue and what’s happen in their company and their work the impact, and what the team planning. Beside, employees are more concern and participate effectively what is going on throughout the organization if they are directly and consistently informed about the issues. The negative results can include missed opportunities, delayed projects, and failed initiatives if they stay quiet. They also will indicate that the conversation is relative value of organization. In addition, written and formal communication cannot cultivate the sense of belonging due to the human nature are love to impersonal such as face-to-face communication and directly between managers and employees. Furthermore, managers are essentially two-way information conduits. [4][5]

A manager always needs to motivate and support the employees which it make job easier. According to oxford dictionary, motivate can define as provide someone with a motive for doing something. Employees need their needs and motivation which is becomes the main focus of managers. However, a manager should realize that it is very difficult to motivate people, so, a manager must create the environment that encourages him and employees’ self-motivation. They must understand what motivates that employees need and the behavior that need demonstrate to perform their work due to one of effective way to create satisfaction. For example, personally thank employees for doing the good job and involve employees in decision. Motivate and supports are vital to enhance performance of an organization. The motivation can improve the productivity like the rapidly growth of company, leads to achievement of organizational goals and stability of work force, builds friendly relationship and improves level of efficiency of employees. However, manager should able to self-motivate to motivate others which help in career success. [6][7][8]
Next, goal-settings is one of the Human Resources which improving productivity. Goal setting is the process to deciding what organization wants to accomplish and devising a plan to achieve the result needs which it also known as mission and vision. Beside, goal setting is motivational technique based on the concept that the practice of setting specific goals enhances performance, and set difficult goals results in higher performance than setting easier goals. Goals have a pervasive influence on employee behavior and performance in organizations and management practice. Everybody in this world has its own goals but they must work smartly to achieve it. For example, the goals for Brian Tracy International Company are helping in employees’ achievement and personal and how to make business goals faster and easier. [9][10]

According to history, Frederick W. Taylor is the one of the earliest application of goal setting. He combined his goal setting methodology with monetary incentives, but research by Edwin Locke and Gary Latham found that goals alone can make to corporate performance with or without a bonus. They found that difficult goal increase output and the hard goals is good motivator and the harder the goal the better employee performance becomes. [11] In addition, one of the strategy to achieve the goals is using the S.M.A.R.T. goal-settings which is simple way to reach success. This strategy helps to accomplish employee’s personnel, financial and professional goals. There are meanings by word S.M.A.R.T. First, the ‘S’ mean Specific which refer to the language of manager’s goals must be specific. They must make up with questions like ‘what we want to do?’ ‘Why we want to do?’ and ‘how we want to do?’ to defining the goals. ‘M’ means Measureable. Goals need to be measureable in the form specific number. ‘A’ mean Attainable. Goals setting needs to be something that organizational can achieve and have confidence to achieve it. Confidence is the significant factors according to goal setting theory which is ‘R’: Relevant. Short-term goal have to relate with the long-term goal and relevant to the participants. ‘T’ means Time that the period of goals to succession. [11][12]

Thirdly, performance measurement is defined several of the relevant terms, arguing that the performance vocabulary emphasizes the rigor of following a logical process, it focuses on the ultimate outcomes, and it relies on the collection and interpretation of data. According to Dr. Robert S. Kaplan, Harvard Business School, “Each organization must create and communicate performance measures that reflect its unique strategy”. Process system involves the study of the process or strategy of the organization and learns the engineering process or phenomenon, to see whether the output is in line with what it means or have been achieved. [13][14]

Next, performance measurement estimates the parameters under which the programs, investments, and acquisitions are reaching the targeted results. However, the model for the defective performance set a good performance is the criteria which determine the organization’s ability to cope. This may reflect a disadvantage that does not support the organization and to grow with the goals set. In other hands, performance evaluation is different between conducted in the design, construction, operation and maintenance of systems, machinery, equipment, structures, materials and processes. In the design, performance measurement can be physical attributes, parameters while in the maintenance, it will repair, and operations. [15]

Performance measures quantitatively tell something important about products, services, and processes that produce them. They are tools to help us understand, manage and improve what our organizations do. The performance measures were a question or a problem in producing a product. There are five steps of the extent to which we should do to better production, if we reach our goal what should be done, if we are satisfied customers what should be done by a company, if we are in the process of statistical control what should be done and we need to know where improvements need to be done to better the production. [15]

Performance measures are always tied to the goals or objectives to achieve the target to provide us with the information needed to make intelligent decisions about what we do. So, it can show changes in the process or deviation from design specifications. For example, single unit dimensions typically represent the steps are very basic and some process or product basis. More often, the unit of measurement used various dimensions. These performance measures are expressed as a ratio or two or more base units. This may be units such as; the number of accidents per million hours worked which is a measure of performance or safety programs, or the number of vendors at the time of delivery of the shipment volume vendors. Performance measures expressed this way almost always convey more information than performance measures one dimension or one unit. Ideally, performance measures should be expressed in the most meaningful measure for those who need to use or make decisions based on measures. [15]

Better management of performance measures tell something important about products, services, agencies, and management processes. These measures are a tool to help understand, manage and improve. Performance measures that can effectively monitor performance to assess how well we are doing, know if we meet our goal and if our customers are satisfied, take action to affect the performance or improve efficiency if the necessary improvements. It also may have the desired characteristics of the other useful measures to help people do the work to understand what is happening with their business processes, and how to get better results for customers. Influence related to the ability of agencies to influence the performance measures. [16]

Fourthly, coaching is a teaching, training or development process which an individual is supported while achieving a specific personal or professional goal. The individual receiving coaching may be referred to the client. Sometimes, the term coaching may be applied to an informal relationship between two individuals where one has greater experience and professional than the other and offers advice and guidance as the other goes through a learning process. The structures and models of coaching are numerous and may be designed to facilitate thinking or learning new behavior for personal growth or professional advancement. They are forming the group of coach; so they help their coachee to improve a physical skill like in a sport or performing art form. [17]

Coaching relates primarily to performance improvement (often short-term) in a specific skills area. The goals or at least the intermediate or sub-goals are typically set with or at the suggestion of the coach while the learner has primary ownership of the process. In most cases, coaching involves direct extrinsic feedback. For example, the coach reports to the coachee what he or she has observed. Usually, the meeting will focus on very specific objectives within a set period of time. In addition, coaching also is mainly concerned with performance and development of certain skills. It usually takes place on a one-to-one basis and has a very specific
purpose. There is usually a planned program with a much shorter timeframe than in mentoring, so the learning goals are usually determined in advance. [17]

There are two types of training, firstly is general includes communication skills, computer systems application and programming, customer service, executive development, management skills and development, personal growth, sales, supervisory skills and technological skills and knowledge. Secondly is specific such as basic life/work skills, creativity, customer education, diversity/cultural awareness, remedial writing, managing change, leadership, product knowledge, public speaking/presentation skills, safety, ethics, sexual harassment, team building, wellness and others. For example, the director of training for Canon, it’s the repair personnel’s technical skills that are important. As a part of their training, repair people play a video game based on the familiar kids’ board game operation in which lights flashed and buzzers sounded if copier parts were dragged and dropped poorly. [18]

Performance coaching focused on achieving specific performance goals, either improvement goals or stretch goals to build on recognized strengths usually within a limited time period. Sometimes, performance coaching involves passing along knowledge but that’s only a small part of the activity. As a performance coach, real goal is to help a person improve the way they perform in a specific area. Like any other skill, performance coaching is a process that you need to learn and practice in order to use effectively. Roles of human resource and training also change, from new organizational structures, process, jobs and specializations and operations the success of training depends on two clear and specific purpose which are to equip employees with the knowledge, thinking and the skills to carry out mission-critical tasks. [19]

In the other hands, there are many organizations are relying more on technology-based training methods because of their accessibility, cost and ability to deliver information. Firstly, on the job means employees learn how to do tasks simply by performing them usually after an initial introduction to the task. Secondly, job rotation which is employees work at different jobs in a particular area, getting exposure to a variety of tasks. Thirdly, coaching that employees work with an experienced worker who provides information, support and encouragement also called apprenticeships in certain industries. Fourthly, exercises that employees participate in role playing, simulations or other face-to-face types of training. Fifthly, use workbooks or manuals refer to training workbooks and manuals for information. Lastly, classroom lecture by attend lectures designed to convey specific information. For examples, technology-based training methods used CD-ROM, videotapes, podcasts, video conferencing or e-learning internet. [20]

Last but not least, rewards are also important in human resources to have a good performance in an organization. Reward management is concerned with the formulation and implementation of strategies and policies that aim to reward people fairly, equitably and consistently in accordance with their value to the organization. Reward management consists of analyzing and controlling employee remuneration and all of the other benefits for the employees. Reward management aims to create and efficiently operate a reward structure for an organization. Reward structure usually consists of pay policy and practices, salary and payroll administration, total reward, minimum wage, executive pay and team reward. Most people assimilate "rewards", with salary raise or bonuses, but this is only one kind of reward, extrinsic reward. Studies proves that salespeople prefer pay raises because they feel frustrated by their inability to obtain other rewards, but this behavior can be modified by applying a complete reward strategy. [21][22]

The remuneration of certain behaviors that make a difference to a company is more challenging than satisfactory performance, but you can overcome that obstacle by asking, "What am I compensating my employees for?" and "What are the behaviors I want to reward?" For example, compensate someone for innovation or for the amount of time they're sitting at a desk? There's obviously a big difference between the two. Managers must take the best ways in rewards the employees to make sure the organization success and know what it should include. Managers also need to review strategic rewards like does it address compensation, benefits and is it the rewards aligned with your remaining business strategies, is it driving the right behaviors for your company, as well as your performance goals. This element can make sure the organization success or failure. The more satisfying reward when it can create an environment of competition among peers to perform better than others while a poor reward system will create an indifference of employees towards your performance management system. [21]

There are two kinds of rewards. First, it is extrinsic rewards. Its means concrete rewards that employee receive. For example of this rewards are like bonuses, salary raise, gifts, promotion, and also other kinds of tangible rewards. Second are intrinsic rewards. This rewards means tend to give personal satisfaction to individual. The example of this rewards are such as information or feedback, recognition, trust, relationship, empowerment and monogrammed name plaque. Intrinsic rewards makes the employee feel better in the organization, while Extrinsic rewards focus on the performance and activities of the employee in order to attain a certain outcome. The principal difficulty is to find a balance between employees' performance (extrinsic) and happiness (intrinsic). [22]

In an organization a manager also have to know the best ways to rewards employees and the appropriate reward system. Having an effective reward program in place can help solve many of your human resources issues. The employees should take immediate steps to reward the performers. Rewards should be appropriate and matching the performance, and to some extent the expectations of performers. It can be in terms of cash bonus, promotions, vacations etc. A winning system should recognize and reward two types of employee activity-performance and behavior. Performance is the easiest to deal with because of a direct relationship between the initial goals manager set for the employees and the end outcomes result. For example, manager can implement or recognize sales incentive plan for him to achieve regularly. [23][24]

CONCLUSION

Human resources are very important to performance due to its outcomes which are improving employee commitment and operating efficiency, accomplish organizational goals and cost effectiveness. In long-term outcomes are the individual and societal are wellbeing and organizational effectiveness. According to Porter in the 1980, business strategy can understanding by formulating a framework that described three competitive strategies which are cost leadership, differentiation and focus.
In other hands, Human Resource effectiveness must improve due to its crucial function of performance. The organization can improve Human Resources effectiveness by restructuring, outsourcing, process redesign and new technology of organization work can improve employee proximity, skills and ease monitoring employees’ input.

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A Study on the Effect of Commuting Distance on the Organizational Commitment

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ABSTRACT: Urbanization has led to a high rate of necessity to commute nowadays. Regardless of the other factors, sometimes employees have no choice but to commute to work. The aim of this paper is to study on how does the commuting distance affects the organizational commitment of an employee; whether it is the continuance, normative of affective commitment is affected.

Keywords: organizational commitment; commuting; commuting distance; work location.

INTRODUCTION

Over the decades, although organizational commitment and its factors has been a lot discussed by many scholars and academicians, there are still some precedents remained untouchable and left to partial assumptions, for an instance whether or not commuting affects organizational commitment. I have hereby chosen to study on this aspect to fill the gap of knowledge in the field of Management Principles that I’ve found. The literatures collected and analyzed in this review are all in the form of journals and are all obtained from the online databases such as SCOPUS, Emerald and Science Direct. So far, in this literature review, more than 20 researches has been studied.

It is very important to know if the commuting affects an employee’s organizational commitment because most of the employees nowadays commute quite a distance due to the urbanization and the level of organizational commitment of an employee has a high tendency to affect his or her productivities. A person is said to commute when he or she travels between his or her place of residence and place of work or full-time or even any regular travelling not on work reason on a daily or routine basis. Ignoring the aspect of commuting[1], an employee would have his own commitment component. An employee’s level of productivity, other than very directly linked to the organization’s purpose of establishment, is also very important to evaluate their performance at work. This topic or question has caught my interest because as we could see now, the world is undergoing dynamic changes. In today’s world, where most people travels a lot to work be it on their own transport or public transport, I have a high confidence that it does affect the emotions of the employee [2] thus also affects the job satisfaction and organizational commitment indirectly [3].

A research on the transportation precisely for personal and social network has been conducted but so far as recorded until today, no precise research had been conducted on impact of commuting on organizational commitment [4].

The main objective of this research is to study whether commuting distance affects the organizational commitment of an employee and if it does how it affects. The objective of this work-literature review is to study and get a critical and detailed look at the already existing research that is relevant and in a way or another contributes to my research topic. It is also to show how these researches are linked to one and another and also how it relates to my research topic whilst revealing the knowledge gap realized.

For a better enhancement on the understanding on the trend of researches, the paper will be further structured into some segments; Organizational Commitment and Commuting.

1. ORGANIZATIONAL COMMITMENT

Organizational Commitment is said to be possessed when you’re emotionally attached to an organization you belong to. It can be defined as how deep an individual recognizes an organization and is committed to its goal. As mentioned, this research proposed is to study the effect of employers’ commuting distance on organizational commitment. Breaking it simpler is to study how does the distance that a worker has to travel to work on routine basis affects their commitment and attachment towards the organization they belong to. Based on the model of Meyer and Allen[5] the organizational commitment is comprised of three components which are the affective commitment, continuance commitment and normative commitment. Affective commitment is when you’re affectionate with a course of action that they have emotional identification with, attachment to or shared values with their occupation, they become less sensitive to the perceived cost or obligations [7]. Commuting distance or any other factors may affect an employee’s organizational commitment easily if he has normative commitment but will make least significant impact on those who are affectively committed, and a moderate implication on those whose commitment is a continuance commitment.

It is very important to know if the commuting affects an employee’s organizational commitment because most of the employees nowadays commute quite a distance due to the urbanization and the level of organizational commitment of an employee has a high tendency to affect his or her productivities. A person is said to commute when he or she travels between his or her place of residence and place of work or full-time or even any regular travelling not on work reason on a daily or routine basis. Ignoring the aspect of commuting[1], an employee would have his own commitment component. An employee’s level of productivity, other than very directly linked to the organization’s purpose of establishment, is also very important to evaluate their performance at work. This topic or question has caught my interest because as we could see now, the world is undergoing dynamic changes. In today’s world, where most people travels a lot to work be it on their own transport or public transport, I have a high confidence that it does affect the emotions of the employee [2] thus also affects the job satisfaction and organizational commitment indirectly [3].

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1. ORGANIZATIONAL COMMITMENT

Organizational Commitment is said to be possessed when you’re emotionally attached to an organization you belong to. It can be defined as how deep an individual recognizes an organization and is committed to its goal. As mentioned, this research proposed is to study the effect of employers’ commuting distance on organizational commitment. Breaking it simpler is to study how does the distance that a worker has to travel to work on routine basis affects their commitment and attachment towards the organization they belong to. Based on the model of Meyer and Allen[5] the organizational commitment is comprised of three components which are the affective commitment, continuance commitment and normative commitment. Affective commitment is when you’re affectionate with a course of action that they have emotional identification with, attachment to or shared values with their occupation, they become less sensitive to the perceived cost or obligations [7]. Commuting distance or any other factors may affect an employee’s organizational commitment easily if he has normative commitment but will make least significant impact on those who are affectively committed, and a moderate implication on those whose commitment is a continuance commitment. This is not a proven statement but rather a derived assumption from proven theories, to test the solidity of the statement, the proposed research has to be conducted. To
gain the mostly claimed the best component of commitment; affective commitment, job satisfaction is important as it is causally antecedent to the organizational commitment [8]. When affective commitment is inculcated, it means the person would like or be attached to an organization out of his own will and this sort of commitment is difficult to be manipulated thus; stronger commitment with the organization has been bonded.

When the research is being conducted, which component of organizational influenced will be studied. However despite the research topic here, many values or factors that impact on the organizational commitment of an employee directly or indirectly has been studied.

In a community, stronger collectivist value results in stronger affective and normative commitment. In relative to normative commitment, the affective commitment is more positively related to the collectivist value. Power distance affects the organizational commitment at the normative commitment component. Stronger power distance creates stronger normative commitment - taking into consideration the national difference in culture [9]. Before the effect of collectivism and power distance were studied on organizational commitment, a study on the on value control has been conducted on Hungary (a less developed area) and the results were compared to the pattern of the findings of western country especially US. The mentioned study came out with a finding that states the degree of value control (locus of control) an individual have over their environment and the degree of which they experience control (managerial control mechanism) have no effect on organizational commitment but correlates with work-related alienation [10]. As this is a proven study finding in Hungary, another research conducted in Turkey in a way or another has a relation with it. Leaders are to possess internal locus of control compared to the followers or workers. As in the research conducted in Hungary, locus of control does not affect organizational commitment, but the research in Turkey has actualized the fact that internal locus of control increases the quality of leadership and the leadership, also organizational culture does impact the organizational commitment. Inspirational motivation and individualism considerate leadership style affects the affective commitment of an employee positively. Contingent reward has positive effect on both continuance and normative commitment. When an organization is run in such a way that goal clarity has been found to be associated with employees, it promotes normative commitment [11].

As time travels, sectors becomes more modern and knowledge expands, experts and academician believed that not only those who work under the organization be obligated under the organizational commitment but also the customers and clients [12]. Organizational commitment is not only meant for employees but also for the clients and customers where a customer that has organizational commitment shows their loyalty by repurchasing intention and actual repeat patronage behavior. It is learned that affective commitment rather than continuance commitment influences loyalty to a much higher degree. The factor that increases the affective commitment mentioned here is through non-economic means such as communication, and the environment where else the continuance commitment meant here is to be gained by economic means such as loyalty discount card.

Researchers have also been conducted on the relationship of career mobility [13] with organizational commitment. Extent of relationship between mobility and commitment depends on the dimension of commitment being measured (affective, continuance and normative) and the type of mobility (external or internal). It is proven that external career mobility is negatively related with the normative commitment where else, affective commitment increases significantly after the move of both internal and external movers. Continuance commitment is proved to increase with the internal career mobility. The continuance commitment and normative commitment remains stable after change for both internal and external movers [14]. If analyzed, it has clearly been proven that many researches has been conducted on studying the aspects that affects organizational commitment no matter precisely any component of it or the whole of it, no matter attachment by worker or client.

2. COMMUTING

As the rate of urbanization increases and development of cities becomes rapid, the need for commuting also increases due to the distance increment. In the context of research topic proposed here, we shall understand the destination of the commuting we meant here as either workplace of place of work.

Throughout this last decade (2003 to 2013), many researches, and in fact in an inclining manner relating to commuting has been conducted especially on the effects and impacts of commuting. This trend in the frequency of researches relating to the commuting is clearly realized because of the urbanization factor.

Industries never stay constant, it always undergo advancement and dynamic. The advancement and changes sheltered on industries always ended up in chain reaction. Urbanization is one of those effects of industries advancement or even revolution. This urbanization issue here causes decentralization of jobs. Where this decentralization of job alters the urban spatial structure, commuting patterns and process. The job decentralization in a short or long term results in residential moves. Research has been conducted to study the relation between residential moves and job location, specifically studying the sensitivity of the household to the distance of commuting [15].

Previous research that this research conducted by William A.V. Clark has proven that longer commuting distance results in migration taken up as alternative for migration for dual-career household. This extended research on the previous research has proven that distance does matter and the households are acutely aware of the trade-off between distance to work and residential location.

On the other hand, a local research has taken place in Finland based on the average commuting distance where it studies the link between commuting distance and frequency, focusing on impacts of teleworking on commuting [16]. The study has indicated that teleworking has reduced the commuting distance travelled in Finland by 0.7% also that the probability of teleworking increases as the commuting distance increases. Commuting distance has been recorded to be increasing due to many reasons such as increasing property prices in central urban areas, traffic connections and political decisions. Under some statistical analysis, it is seen that people commuting in the range of 80km to 100km, their commuting frequency is affected whereas those commuting distance exceeds 100km, the common solution is to avoid daily commuting.
Again, in another research urbanization is involved in the study related to commuting. Car dependency reduction and sustainable mobility stimulation is believed associated with urbanization. The impact of commuting on these two phenomenon mentioned is studied through an analysis of workplace relocation. This study shows that work relocation does cause changes in mode of transportation chosen but insignificantly on the commuting time. The work relocation that increases the distance tends to increase the tendency of public on alternative which is using the public transportation though it increases the commuting time. It proves rather than reducing the commuting time, workers or public seeks better to maintain the commuting time within a certain acceptable value. Other than hand, there are people who prefer public transportation. Affective factors play a big role on choosing private transportation ignoring the other commuting factors [17] here in this research; it did touch a little about how affective commitment affects the commuting preference but did not go any detail. Research has also stated that habit has a strong effect on choosing commuting mode [18]. Despite habit, upon the work relocation, a research that studied the effect of work relocation for 5 years has proven the existence of commuting time tolerance in which it means that the strategy of commuting is to commute within an acceptable (tolerated) travel time [19].

Though the commuting tolerance is studied, a research was yet conducted to study the willingness to commute long-distance. The difference between this going-to-be-discussed and research and previously discussed research is that the previous research was conducted among already having long work experience worker or within workforce and due to work relocation whereas this research studies the willingness to commute long distance among the job seekers and conducted locally in Dalarna, Sweden. The willingness of individuals from different socio-economic situations and experience of unemployment is analysed. Other than status of employment, this research has also studied on the factors influencing willingness to commute longer distance (more than 40km), such as the gender, level of education, presence of children in the household, age and length of unemployment interaction, age and educational level and age and gender interaction [20]. Proven through this experiment was a lot of factors such as; men are more prone to long distance commutes compared to women and that old men are even more willing to commute longer distance in relative to the younger ones. Other than that, those with younger children at household are more willing to commute than those who do not have children or have older children because they are less willing to migrate to new places. Older people with longer experience of unemployment, due to their age nearing retirement, have reduced ambition and expectation for potential employment opportunities seems to have low willingness for long time travels to work place. The last but not least of the research was that highly educated people are more likely to travel longer for potential job compared to lower educated people.

Later on a research was conducted to study the effect of individual and organizational determination on the commuting behavior of workers. As commuting mode change is found out to be high-cost behavior [21], changeability of the commuting or travel mode was perceived to be relatively low irrespective of the individual’s preferred mode of travel. It has also been studied that there is no uniform effects on the employer choice of commuting mode by the financial incentives because of personal income and the strength of their attitude. The difference in organizational focus was related to the time loss and travel frequency tolerance. After some analysis, it was found that the frequency negatively related to the worker’s attitude towards business trip [22] but no research has yet been conducted to study the relation between the commuting distance on the organizational commitment. Also found out was behavioral level might be the result of different underlying dynamics [22].

There are many other researches involving commuting has been conducted in the recent decade but just a few were conducted in the field of organizational psychology.

3. CONCLUSION

Reviewing all these previously done researches throughout this recent decade, it can be seen that some of the researches done has simply or just touched the surface of what is proposed to be researched here. Many aspects, impacts and effects of organizational commitment have been discussed but coming to the commitment, it has merely touched the surface; a detailed research has to be conducted. On the other hand, if analyzed, the trend of the studies carried on on commuting, from operational field has increasingly been carried out in the field of organizational and industrial psychology. Anyhow, an in-depth research involving organizational commitment is yet to be done. If these emptiness or weakness could be overcome, then the organization would know and make better decision on work relocation and location decision regarding branches launching.

4. ACKNOWLEDGMENTS

This study was a tutorial practice for undergraduate student, the first author. Responsibility of presented information is with the student. Research consultation and method teaching was with the second author. This study is supported by University Malaysia Pahang research grant (RUD130375).

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To Study the Impact of Just-In-Time System

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ABSTRACT: The purpose of this research is to study the Impact of Just-In-Time (JIT) system on inventory and financial performance. JIT production has received a great deal of attention, worldwide, since its introduction in Japan a few decades ago. It has been well documented that some of the main benefits of JIT implementation are reduction of inventories and cost savings. JIT philosophy has been primarily used in manufacturing operations to manage materials and other production activities. The overall goal of JIT is to eliminate waste and it is a continuous process that can be viewed in terms of the extent to which the culture and philosophy of JIT permeates the organization.

Keywords: Type your keywords here, separated by semicolons;

INTRODUCTION
Just-in-time (JIT) systems control work flow by bringing in materials and sending out goods on demand. JIT also refers to an integrated, problem-solving approach aimed at improving quality and facilitating timeliness in supply, production, and distribution [1]. This just simply means that just-in-time is a production and inventory control system in which materials are purchased and units are produced only as needed to meet actual customer demand. JIT requires that a firm has a few dependable suppliers and is believed to improve productivity and build a leaner manufacturing system which minimizes inventories and minimizes risk and helps to reduce the cost of manufacturing. With JIT, the ultimate goal would be zero inventory. Companies typically hold inventory in three locations that are raw materials, work-in-process inventory of partially worked materials or sub-assemblies for workstations to complete and finished goods to be shipped out to customers.

The topic of Just-in-time inventory is very important and relevant to all operations managers today. It has become a major factor of competitiveness in the global environment. The concept is a minimized costing system that increases efficiency, productivity and quality through economies of scale and control. Current business enterprises need this for both cost benefit and effectiveness to increase their chance of survival in the competitive market of the global environment.

The main benefits associated with the JIT inventory are reduce set up time. Reducing the set up time enables the company to lessen or eliminate inventory for “changeover” time. Besides that, JIT can improve the flow of goods from warehouse to shelves. Individual or small lot sizes lessen the lot delay inventories, thus simplifying inventory flow and management. Moreover, efficient use of employees with multiple skills are implemented in JIT. Featuring employees to work on distinct parts of the process enable companies to move workers when they are required.

The objectives of this research proposal is to identify the effects of JIT on inventory cost and explore the effects of JIT on financial performance of manufacturing firms in Malaysia. The aim of this research is to review previous works in JIT inventory and analyze the available literature to distinguish the gap of knowledge in this field. We ask that authors follow some simple guidelines. In essence, we ask you to make your paper look exactly like this document. The easiest way to do this is simply to download the template, and replace the content with your own material.

1. The impact on the inventory level
One of the characteristics of JIT is inventory reduction. Based on one of the journal, some firms that deliver on a JIT basis are reducing their inventory holding while others are experiencing the opposite [2]. Based on the research that he did, 9 of the 18 firms in the study claimed to manufacture JIT. Those suppliers which manufactured JIT themselves were generally able to reduce inventories. However, one supplier to the electronics sector that had implemented JIT manufacture and purchasing had seen an increase in finished goods inventories. Suppliers which did not purchase or manufacture on a JIT basis had seen increases in inventories in terms of raw materials, work in progress (WIP) and finished goods. Firms which were able to manufacture JIT themselves were able to achieve JIT delivery without the consequences of increased inventory holding. The suppliers in the study that did not manufacture JIT had experienced increased inventories. Increased inventories were primarily due to long purchase and manufacture lead times, fast response time demanded by the customer, schedule instability and safety stock requirements.

The implementation of JIT can improve firm performance. The companies have cut finished goods inventories. For example, some of the work-in-process inventory was cut from 30 days to 3 days [3]. JIT promotes conditions necessary to manufacture high quality products to meet market demand with small levels of inventory and high levels of productivity. Furthermore, JIT can reduce the inventory and other forms of waste while maintaining customer service because it identifies those factors that cause waste to happen [4]. One of the goals of JIT is to reduce finished goods inventories. Inventory can be minimized by ensuring that all needed materials, parts, and products are produced just in time and in the correct quality and quantity. Parts and products are produced only if needed, not to be stored in a warehouse for future use [5]. Reduction of inventory is a result of JIT practices and a measurement of overall improvement and performance of the system [6]. Actually, reduction of inventory throughout the system can be divided into raw material inventory, in-process inventory, and finished goods inventory. The amount of inventory on hand was measured by the number...
of weeks of inventory maintained by the firm [7]. It was found that JIT is inversely related to inventory levels because inventory reduction is one of the most commonly cited theoretical advantages of JIT. Moreover, inventory levels of inbound materials, work-in-process, and outbound goods were found to be inversely related to JIT. Inventory reduction in all areas can be used as a measurement of overall improvement and performance of a JIT system. Not only that, our results also indicate that size can directly influence overall inventory levels. The larger the firm, the fewer the weeks of inbound and outbound inventory are kept on hand [8].

The most highly publicized theoretical advantages of JIT is the overall reduction of inventory. One of the predominant indicators of JIT effectiveness, a made to order or pull-based system is related to inventory reductions. In this sense, raw materials tend to exhibit an immediate reduction. At the same time, the reduction of work-in-process lowers the costs of inventory holding and related activities. Finally, the level of finished goods inventory should be reduced as a result of improvements in process reliability and reduced cycle times. One goal of JIT is to reduce or eliminate the need for raw material, work-in-process, and finished goods inventories. By ensuring that all needed materials, parts, and products are produced just in time and in the correct quality and quantity, inventory is minimized. In other words, reduction of inventory is a result of JIT practices and a measurement of overall improvement and performance of the system.

The reduction of lot sizes helps to reduce both inventory and inventory costs related with carrying the inventory because the maximum inventory level and the inventory reorder quantity drops [9]. Reducing set up time is an excellent way to reduce inventory investment and to improve productivity [9]. He explain that JIT make every effort to utilize small lot sizes that are “pulled” rather than “pushed” through the manufacturing process [9]. Furthermore, this statement is supported by Selto, that he claimed JIT unlike traditional supply chain systems where parts and products are pushed through the system as quickly as possible, the JIT system concentrates on avoiding the manufacture or delivery of parts and products before they are needed, only to build safety stock or buffer inventories that sit idle accumulating inventory carrying costs [10]. It is simply means that, the low level of the holding stock on hand will reduce inventory carrying stock.

2. The impact on the financial performance
JIT can enhance financial performance because defects are detected faster in small batches. In a meantime, costs are minimized through holding low levels of inventory, thus supply chain becomes more responsive and flexible. The selection of suppliers is on the basis of least total cost. The total cost here included delivery reliability, price and quality. The relationship with the suppliers are based on long term emphasis and suppliers are either single or dual sources. As a result, a closer relationship between buyer and supplier can be formed. Moreover, a form of mutual dependency built among them. By extending JIT to the supply chain system, both the buyer and the supplier get benefits from it. Thus, a win-win situation can be produced. The buyer is able to shift the responsibility for inventory and quality to the supplier, consequently benefiting through reduced inventory costs and reduced re-work costs. The buyer may also be able to benefit through value engineering (VE) savings by involving the supplier in the design stages. Further savings can be made by reducing material handling costs through the implementation of standard or reusable packaging. In the automotive industry at UK, the principal objective behind JIT is to push costs back on to suppliers in order to gain control and to buffer the buyer against demand fluctuations as it will be most severely borne by the sub-contractor [11]. There are two distinct viewpoints been identified from the literature review. The first suggests that both participants in a JIT supply relationship will benefit. The other suggests that JIT procurement simply transfers costs to an upstream organization. All suppliers indicated that the administrative burden had increased. Some firms managed to utilize existing resources to cope with it. Therefore, there were no extra costs been incurred although others had incurred extra costs.

The specific financial implications of JIT include gains in revenues and reductions in costs resulting in increased net income and profitability [12]. Revenues should increase if the cost reductions are passed on as lower prices but this also need to depends on demand elasticity. Costs should decrease through reductions in total costs of material acquisition and storage, reductions in repair and warranty costs, and reductions in inventory audit time and costs [13]. Thus, JIT strategies can improve financial efficiency by increasing revenues and decreasing costs. This results in increased of net income and improved profitability of the company.

Recent models comparing inventory costs under JIT purchasing plans and economic order quantity (EOQ) purchasing plans have tended to favor EOQ purchasing in situations where annual demand of inventory is moderately large. Presents a series of inventory purchasing cost models that extend prior methodology by including relevant physical distribution cost savings [13]. Additional comparative models are presented to further demonstrate how other relevant costs factors can be included in a comparative EOQ/JIT model. A cost comparison with an existing problem from the literature is used to illustrate the informational efficacy of new models. In an early research done by the EOQ model was reconverted into a series of JIT purchasing models that could be used in determining inventory deliveries and cost savings. This models demonstrated how total annual inventory ordering costs could be minimized by placing an optimal number of smaller-sized, more frequent order deliveries under a JIT system [14]. It is important to note that their models showed no limitation on the cost advantages of using JIT based on the model parameter of annual demand. Many recent researchers felt that the economic impact and complex costing structures observed in JIT operations can be accurately captured and measured in models [15]. One of the researchers, Fazel, developed a series of innovative models that can be used to directly compare EOQ and JIT systems to determine which is best in a particular cost structure and at a particular annual demand level. He showed that regardless of an organization’s cost structure, JIT inventory purchasing was only preferable at lower levels of annual demand. Furthermore, he demonstrated that at a certain annual demand level, the cost advantages of EOQ purchasing would always be preferable to a JIT purchasing system. Products, firms, and industries where inventory represents a dominant cost component in the total cost to customers will be able to benefit from using JIT ordering systems. For each product, firm, and industry there are potential cost differences that might lessen the importance of one cost component over another in the models presented in this research. Some cost components were categorized into seven different types of EOQ-related cost opportunities under a JIT system [16].
This journal is about the use of performance measurement systems in firms implementing JIT. Mail questionnaire was sent to larger New Zealand manufacturing companies. A total of 36 percent of the sample of companies had implemented a JIT programme. JIT firms were found to use non-financial performance indicators to a greater extent than non-JIT firms. For JIT firms, there was a significant positive correlation between the use of non-financial performance indicators and organisation performance. A significant positive correlation was also found between the use of non-financial performance indicators and organisation performance for all firms in the survey. Results from this study suggest that there are benefits in adapting the accounting performance measurement system to support and enhance JIT implementation. The study indicates potential benefits from the use of non-financial performance measures for both JIT and non-JIT firms.

Manufacturers expect that by adopting JIT strategy, their financial performance will improve. However, so far only a few studies have been carried out to show the effect of JIT on a company’s financial performance. JIT systems will increase gain in revenues, reduce costs and increase profit, hence there will be higher percentage of return on asset and sales. The reduction of costs will decrease through reduction of storage, repair and warranty costs on the inventory. Besides that, the quality of the goods will become more supreme when JIT is implemented, thus sales volumes for these firms are increased substantially over the time period.

JIT strategies therefore aimed to improve financial efficiency by increasing revenues and decreasing costs [17]. This results in increased in net income and improved profitability. As productivity increased and assets are used more efficiently, return on assets (net income/total assets) will rise. The improved efficiency and subsequent freeing-up of assets that may be used for additional sales should cause a similar increase in the asset turnover (sales/total assets).

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This study was a tutorial practice for undergraduate student, the first author. Responsibility of presented information is with the student. Research consultation and method teaching was with the second author. This study is supported by University Malaysia Pahang research grant (RUD130375).

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Study on Impact of Lean Six Sigma

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ABSTRACT: This paper purpose is to investigate the benefits of Lean Six Sigma to the Malaysian automotive industry. Lean is an approach that seeks to improve flow in the value stream and eliminate waste. It’s about doing things quickly. Six Sigma uses a powerful framework (DMAIC) and statistical tools to uncover root causes to understand and reduce variation. It’s about doing things right (defect free). As global competition continues to grow, the pressure to improve becomes more and more intense. Thus, a combination of both Lean and Six Sigma is born. This method provides an over-arching improvement philosophy that incorporates powerful data-driven tools to solve problems and create rapid transformational improvement at lower cost. Thus, this paper also tries to examine how the Lean Six Sigma can contribute and brings a positive impact to the automotive industry in Malaysia.

Keywords: Lean production, Six sigma, Lean Six Sigma

INTRODUCTION
This paper introduces the fundamental concepts that are necessary to understand and use Lean, Six Sigma (SS) and Lean Six Sigma (LSS) in an organization. These concepts include a definition, history and philosophy of Lean, SS and LSS. For better understanding of the present study, a comprehensive search of previous literature has been undertaken. As such, this paper was organized in the manner to give an overview of literature, discusses the benefits of LLS.

1. LEAN MANUFACTURING (LM)
Lean manufacturing is a management philosophy that aimed to achieve smooth production flow by eliminating waste through a focus on exactly what the customers want, and increase the activities value. It is derived mostly from the Toyota Production System (TPS) which is pioneered by the Japanese engineers Taiichi Ohno and Shigeo Shingo in the 1950’s [1]. The lean concept evolved as time goes on and from lean production meaning extended to a whole enterprise model and now even to an extended lean enterprise model [2].

Lean operations are also driven by workflow initiated by the “pull” of the customer order. It is aimed at the elimination of waste in every area of production including customer relations, product design, supplier networks, and factory management [3]. As a result, “companies have substantially cut lead times, drastically reduced raw material, working-process and finished goods inventories, and effectively increased asset turnover [3]. This philosophy was based on lean principles.

There are three core principles stated by Womack et al. [5] which are identification of value, elimination of waste, and the generation of smooth flow. However, these principles were further expanded by into five principles:
1. Identifying customer defined value.
2. Optimizing the value stream.
3. Converting the value flow smoothly by controlling and eliminating wastes.
4. Activating the demand pull by synchronizing customer demand and information flow.
5. Perfection of all processes and services through elimination of muda or waste.

There are seven Ohno’s wastes as shown below [5]:
1. Overproduction: Products and services that are in excess to current customer requirements.
2. Wait Time: The time that WIP is not directly related to a customer requirement.
3. Transportation: Moving raw materials, product, or information unnecessarily.
4. Inventory: Work-in-process (WIP) that is not directly related to a customer requirement.
5. Motion: The unnecessary movement by people.
6. Overprocessing: Adding value to a process/product the customer would not pay for.
7. Defects: Flaws in the WIP, final products, or services that do not meet the customer’s requirements.

Lean was adopted widely by manufacturing companies in the 1990’s as a rapid problem solving approach and now it is being successfully used in service and transactional environments, including financial services.

2. SIX SIGMA (SS)
The Six Sigma approach was first introduced in 1987 by Motorola, and its purpose was to improve organizational performance by reducing process output variation [6]. Numerous companies have gained substantial benefits from the Six Sigma programme, though not all are successful [7].

The Six Sigma has two meanings in Total Quality Management (TQM). In statistical terms, Six Sigma is a program with a goal of reducing output variation so that no more than 3.4 defect parts per million opportunities [8]. It requires a process to produce 99.99966% of the products or service units to be defect free with an extremely high capability. For example, if 1 million passengers pass through the St. Louis Airport with checked baggage each month, a Six Sigma program for baggage handling will result only 3.4 passengers with misplaced luggage [9].

The second TQM definition of Six Sigma is a program designed to reduce defects to help lower costs, save time, and improve customer satisfaction [9]. This methodology targets the variation in processes, identifies and eliminates the defects or variations to improve
quality and performance of business processes [10]. The methodology employs sophisticated process analysis, data collection, quality management and control and statistical techniques in an integrated framework [11]. The Six Sigma methodology requires a process to produce 99.99966% of the products or service units to be defect free which means that there can only be 3.4 defected units per million. Early in its development, a team at Motorola developed a four-phase process for improving the quality of its products looking at “Definition,” “Analysis,” “Optimization,” and “Control” [12]. Based on this four-phase process, two additional major processes were developed: the “Define, Measure, Analysis, Improve, and Control” (DMAIC) [13].

Table 1: DMAIC methodology modified from work of Kumar & Sosnoski [14], and Heizer & Render [9]

<table>
<thead>
<tr>
<th>No</th>
<th>Phase</th>
<th>Key processes</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D– Define</td>
<td>Define the project’s purpose, scope, and outputs and then identifies the required process information, keeping in mind the customer’s definition quality.</td>
<td>Pareto analysis; Project charter</td>
</tr>
<tr>
<td>2</td>
<td>M– Measure</td>
<td>Measure the process and collects data.</td>
<td>Descriptive statistics; Process capability analysis</td>
</tr>
<tr>
<td>3</td>
<td>A– Analyse</td>
<td>Analyse the data, ensuring repeatability, and reproducibility.</td>
<td>Detailed process map; Fishbone diagram</td>
</tr>
<tr>
<td>4</td>
<td>I– Improve</td>
<td>Improve by modifying or designing, existing processes and procedures.</td>
<td>Experimentation; New process</td>
</tr>
<tr>
<td>5</td>
<td>C– Control</td>
<td>Control the new process to make sure performance levels are maintained.</td>
<td>Statistical process control</td>
</tr>
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</table>

Näslund [15] argued Six Sigma implementation should involves eight characteristics, that are
1. an understanding of project expectations from the shop floor;
2. leadership of top management;
3. disciplined application of DMAIC;
4. fast application of the project (3–6 months);
5. clear definition of results to be reached;
6. supplying of infrastructure to implement improvements;
7. focus on the consumer and the process;
8. focus on the statistical approach to improvement.

3. LEAN SIX SIGMA (LSS)
The Lean Six Sigma is a new concept in improvement approaches [16]. It is defined as the combination of two most powerful improvement methodologies, Lean and Six Sigma [17]. The goal is to boost quality and reduce costs through elimination of waste and variation reduction in the processes [18], by using two important tools namely “value stream mapping” and “Balanced Score Card” [19]. Organizations around the world are reaping the benefits of competitive advantages and reduced costs. Thus, more and more companies are promoting Lean Six Sigma in their processes. The figure 1 shows how LSS followed two completely different paths and converged to become what is now the most accepted methodology namely Lean Six Sigma.

Figure 1.1 Evolutions of Lean Six Sigma [20]

As shown in the Figure 1, both approaches, Six Sigma and Lean existed in parallel and had separate developments for many years. Six Sigma development was driven by the need for quality improvement in manufacturing complex products since there was a high probability of defective final products, while the elimination of waste was the main motive for Lean Manufacturing development [21]. At first the combination of between Six Sigma and Lean was categorized only as theory as there are some cases facing problem in the control phase of Six Sigma DMAIC methodology after applying Lean Manufacturing to remove all the sources of waste during sub optimization of processes [22]. The fusing between lean and Six Sigma have been implemented in isolation, but unfortunately this act cause a conflict of interest and a drain on resources [23]. However, later, researchers realized that actually both concepts were complementary through their experience in process improvement.

Arnheiter and Maleyeff [21] have claimed that Lean Six Sigma organizations would capitalize on the strengths of both Lean and Six Sigma by applying the primary tenets from each approach. Lean would bring integration of its overriding philosophy to optimize the value-adding components of all processes, constant evaluation of the incentive systems in order global optimization to be assured, and optimization of decision-making process to be based on a customer’s impact. Scientific decision making using data-driven
methodology that strives to minimize variations of quality characteristics and company-wide introduction of a structured training and education regime would be the major tenets brought by Six Sigma.

There have been attempts to combine the two methodologies under titles such as “Lean Six Sigma”. Figure 2 presents the integration of lean and Six Sigma.

Some Lean Tools

~ TPM
~ Kaizen
~ Visual Workplace
~ Work cell design
~ Single piece flow
~ Layout planning
~ Poka-yoke
~ Kanban

~ Brainstorming
~ Process Mapping
~ Standardization
~ Mistake-proofing
~ 7 quality tools

~ Regression
~ Control charts
~ Design of experiments
~ Analysis of means & variance
~ Measurement analysis
~ Capability analysis
~ Robust design

Figure 2: Six Sigma and lean common tools (Modified from work of Antony, Escamilla, and Caine [24], Pepper and Spedding [25], Salah, Rahim, and Carretero [26]).

However, the concepts of lean Six Sigma as an approach to process improvement has yet to fully mature into a specific area of academic research [22]. It can be said that in practice the majority of efforts to fully and comprehensively implement a lean Six Sigma initiative to its full potential have not been realised [23]. This failure to sustain a change towards continuous improvement can be attributed for one, to the lack of commitment from management [27].

If an organization wishes to implement Lean Six Sigma successful, the organization should follow the following lean and Six Sigma principles [21]:

• the organisation must focus on maximising the value-added content in all operations and processes (lean principle)
• the top management must implement a decision-making process that bases every decision on its impact on the customers (lean principle)
• the organisation must constantly evaluate all of its incentive systems to ensure that they result in global optimisation (lean principle)
• the organisation must utilise data-driven methodologies to ensure that all the changes are made based on scientific studies rather than making ad hoc decisions (Six Sigma principle)
• the organisation must utilise methodologies to minimise variations in quality characteristics (Six Sigma principle)
• the organisation must implement a companywide and highly structured education and training programme (Six Sigma principle).

The table 2 clarifies the comparison between Lean and Six Sigma regarding various characteristics.

Table 2: The main differences between Lean and Six Sigma regarding various characteristics (Modified from Bhuiyan et al. [28]; Nave [29])

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Lean</th>
<th>Six Sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td>Evolution in Toyota</td>
<td>Evolution in Motorola</td>
</tr>
<tr>
<td>Objectives</td>
<td>Provide high value to the customer by reducing waste</td>
<td>Product and process improvement; minimisation of variation</td>
</tr>
<tr>
<td>Principles</td>
<td>• Use the best practices and processes to improve efficiency • Reduce costs • Speed up the process.</td>
<td>• Keep the number of defects below 3.4 per million opportunities.</td>
</tr>
<tr>
<td>View of waste</td>
<td>Non-value adding activities</td>
<td>Variation</td>
</tr>
<tr>
<td>Product</td>
<td>Standardized product, preferably with low variety</td>
<td>Manufacturing-, service-, health-care-, government-related product</td>
</tr>
<tr>
<td>Demand</td>
<td>Preferably but not limited to high volume</td>
<td>No special requirement</td>
</tr>
<tr>
<td>Organization</td>
<td>• Total commitment • Long-term buyer/supplier relationships</td>
<td>• Specialist hierarchy, • Project-based, • Metric-performance-driven</td>
</tr>
<tr>
<td>Human</td>
<td>• Intrinsic</td>
<td>• Extrinsic</td>
</tr>
</tbody>
</table>
Despite the several success stories associated with the lean concept, it has some weaknesses. First, lack of flexibility of lean concept decrease the ability of the organization to react to the new conditions and circumstances which may cause the lean organization to become very susceptible to the impact of changes [30]. This is due to Lean concept is focus on perfection, there is no space for flexibility, thus, Lean cannot apply in a highly dynamic conditions as it requires a stable platform where scale efficiency can be maximised [31]. Second is failure in application of JIT deliveries may cause congestion in the supply chain, thus lead to delays, pollution, shortage of workers, etc. [27].

To overcome these weaknesses, the lean approach must integrate the use of targeted data to make decisions and also adopt a more scientific approach to quality within the system [25].

On the other hand, Six Sigma also has its own weaknesses. According to Magnusson et al. [32], it is complicated to reach the customer’s needs and hence increase the customer satisfaction by applying six sigma method. Thus, some companies use voice of the customer tools in their define phase to avoid this problem.

Beside this, Andersson, et al. [31] found that only project with given a certain amount of saving is only allow to start in Six Sigma training project. Moreover, this project usually only involve in the department of the project members which leads to an improvement in the department but also may cause another department to experience deterioration due to change. As a result, SS is sometimes accused for not having a system view.

4. **BENEFITS of LSS**

Lean Six Sigma brings additional value to process improvement, as it integrates Six Sigma focus on elimination of defects and reduction of variation with Lean Manufacturing focus on waste and cycle time elimination [33]. According to Thomas, Barton, and Chuke-Okafor’s [34] case study in a small engineering company which located in the United Kingdom, the integrated implementation of LSS on the production line where the pilot was implemented, there was a 55% reduction in scrap costs, an increase in overall equipment effectiveness (OEE) from 34 to 55%, a 34% increase in the time available for production and a 12% reduction in energy consumption per year.

LSS originated from manufacturing environment and it now effectively implemented in service concerns. It been used in shorten the customer fulfillment lead times for company. Su, Chiang, and Chang [35] carried out a case study on a help-desk service company in the area of information technology. As the main results, the authors found that with the implementation of LSS the company reduced the service time by nearly 52%.

Besides that, LSS can reduce the turnover and thus lower costs of production. This can be prove through the case study which been conducted by Laureani, Antony, and Douglas in a call centre [36]. They found that the service company able to reduce call time, decrease operator turnover and streamline the process with the implementation of LSS. Thus, the annual turnover of the service company fell from 35 to 25% and result a reduction of US$ 1.3 million per year in the costs for hiring process, training and dismissal, among others. Kumar et al. [33] also found that the implementation of LSS is resulted in a significant decrease in the number of defects occurred in the final product and an overall savings of around $140 000 per year in a die casting manufacturer [33].

### Table: Benefits of LSS

<table>
<thead>
<tr>
<th>Resources</th>
<th>Focus</th>
<th>Market situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Shop-floor level project initiation</td>
<td>• Efficiency</td>
<td>Stable, high forecast accuracy</td>
</tr>
<tr>
<td>• Bottom-up approach</td>
<td>• Flow</td>
<td>No special requirement</td>
</tr>
<tr>
<td>• JIT</td>
<td>• Standardization,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cost and waste reduction</td>
<td></td>
</tr>
<tr>
<td>• Top-down selection of improvement initiatives</td>
<td>• Customer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• stakeholder value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• process variation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• statistical decision making</td>
<td></td>
</tr>
</tbody>
</table>

### Methodology

| 1. Identify value | 1. Define |
| 2. Optimize value stream | 2. Measure |
| 3. Convert flow smoothly | 3. Analyse |
| 4. Active demand pull | 4. Improve |
| 5. Perfection of process | 5. Control |

### Tools and Techniques

| TPM | Regression |
| Kaizen | Statistical process control charts |
| Visual Workplace | (histograms, normal distribution graphs, |
| Work cell design | flowcharts, etc.) |
| Single piece flow | Design of experiments |
| Layout planning | Analysis of means & variance |
| Pokayoke | Measurement analysis |
| Kanban | Capability analysis |
| 5 S | Robust design |
| Value stream mapping | Quality management tools (activity |
| | network diagrams, affinity diagrams, etc.) |

### KPI

| Value provided to the customer | Number of defects, customer satisfaction |

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Kumar et al. [33] also found that the implementation of LSS is resulted in a significant decrease in the number of defects occurred in the final product and an overall savings of around $140 000 per year in a die casting manufacturer [33].
In addition, Lean Six Sigma is also led to innovation. According to Byrne et al.’s [37] report, at first, Caterpillar Inc. facing stagnant revenue growth and thus the company decided to implement Lean Six Sigma to gain competitive advantage by breakthrough improvements in January 2001. Implementation of Lean Six Sigma led to product innovation which grows the revenue of the company by 80 percent in year 2005.

5. CONCLUSION

The research on Lean Six Sigma is still on initial stage. However, Lean Six Sigma is the likely to be the next popular methodology for continuous improvement [15]. There has been a great deal of academic research on the topic of Lean Six Sigma since 21th century. According to the database of ScienceDirect, it starts to have more and more journal article. The climate of the amount of Lean Six Sigma journal article is at year 2012 which reached 83 journal articles at that year. However, there are still some uncovered areas of LSS for obstacle and challenges during implementation of Lean Six Sigma.

As the literature shown previously, Lean Six Sigma has been equally beneficial both for manufacturing or service organizations. A review on the past and recent Lean Six Sigma literature has shown that previous researches include the results from different perspectives and are focus on health industry, Engineering industry, service industry, military and etc. The majority of the studies conducted mainly in overseas countries where there are clearer and more comprehensive processes of quality improvement practices. Fewer things have been investigated in Malaysia especially in automotive industries. Thus, there is a need to conduct a research on the impact of implementing Lean Six Sigma in automotive industries of Malaysia.

6. ACKNOWLEDGMENTS

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7. REFERENCES


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Impact on Improving Facility Layout Design on Company System Performance

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ABSTRACT: Layout design is one of the significant roles on company performance and work-cells layout is one of the thriving methods. Therefore, many researchers have pointed out the advantages of cellular manufacturing system. However, in this study, the problems of cellular manufacturing will be pointed out according to company performance: work in process lead time, worker performance and company productivity.

Keywords: facility layout, work-cells layout, cellular manufacturing system, company productivity.

INTRODUCTION
In recent years, the manufacturing and service industries have significant developments. Facility layout designs have a significant impact on system performance: productivity, manufacturing handling cost and work in process lead time. Organization can achieve a strategy that supports differentiation and cost low of competitive advantages by having an efficient and effective layout that determines an efficient of long-run operations [1]. Sundereh S. H [2] defined facilities as buildings where produce a tangible product or provide a service at lower cost and high quality by utilize materials, machines, and other resources that use. Facility layout is an arrangement of everything needed for production of goods or delivery of services [3]. To achieve an effective facility layout design, few factors should be considered. These includes optimal physical arrangement of departments by utilize space, improve flow of information, improve employee morale and safer working conditions, improve customer interactions and flexibility of the layout.

Work-cells layout has steadily gained in popularity over the past few decades. The idea of work-cells was first present by R.E. Flanders in 1925 and has further evolved by Jay and Barry [4]. Jay and Barry have stated out the five main advantages of work-cell which included tasks are grouped, few workers are needed, workers can reach more areas, work area can be more efficiency and communication between workers is enhanced. U-shaped work-cell is one of the popular examples of work-cells layout. According to Seyed [5], work-cell is an arrangement of machines and personnel that focuses on making a single product or family of products. Typically it has 3 - 12 peoples and 5 – 15 workstations in a compact arrangement. Cellular Manufacturing System (CMS) is a concept of performing all necessary operations in a work cells. In CMS, parts that have similar manufacturing requirements are grouped into part families, and machines are organized as machine cells [6].

FACILITY LAYOUT DESIGN
Facility layout problem aimed to find out the minimum distance of flow between two departments. Quadratic assignment problem (QAP) only considers the problem of assign equal-sized department and not applicable with unequal-sized. Montreuil introduced a mixed integer programming (MIP) model for the facility layout problem which used as a basis for several rounding heuristics, but Montreuil’s model only has 0 – 1 variables which cannot solve unequal-sized problem optimally. Therefore, Russell, Venkat and Pamela [7] redefining Montreuil variables and tightening the department area constrains by proposed valid inequalities known as “Eq. (1)” which included “Eq. (1) =” and “Eq. (1) ≥” to increase the range department sizes and ensure problem solve optimality. As a result Eq. (1) performed much better in optimizing the facility layout design problem solving.

\[ \sum_{s=x}^{y} (z_{ij}^s + z_{ji}^s) \geq 1 \quad \forall j > i \]

Eq. (1):

\( z_{ij}^s \) and \( z_{ji}^s \)’s = binary relative location variables, \( i \) and \( j \) were two different departments

The upside down A is the proposed surrogate area constraint since there have no departments can overlap in a valid layout [7].

Amine, Henri and Sonia were using a tree diagram to represent the layout problems which depending on few factors as: the workshop characteristics, what is the problem addressed and the approaches used to solve it [3]. They believed that this tree representation can be improved in future research works. In-depth, workshop characteristics have been divided into six parts: the production variety and the volume, the material handling system chosen, the different possible flows allowed for parts, the number of flows on which machines can be assigned, the capacity of the area, and the size of the area. Four type of layouts have been pointing out which included fixed product layout that suited for manufacturing large size products, process layout that groups facilities with similar functions suited for wide variety of product, product layout for high productivity and low variety of product and cellular layout that machines are grouped into cells, to process families of similar parts. Besides, two facility shapes are distinguished: regular and irregular. Manufacturing cost that has a good arrangement of handling device might reduce for 10 – 30% [8]. Deive and Pierreval believed the type of materials handling device determines the pattern to be used for the layout of machine [9]. Types of materials handling can distinguish as single row layout, multi-rows layout, loop layout and open field layout [10]. Limitation of available horizontal space creates a need to use a vertical dimension of the workshop with the development of multi-floor layout. In addition, manufacturing plants must be able to respond quickly to the dynamic environment; therefore, the idea of dynamic layout problems has been introduced. Two models are generally used on formulate the problem: graph theory and neural network. Several types of optimization approaches have been proposed by: exact methods which used to solve the problem of placing facilities within a given rectangular
According to journals’s literature review that done by Dhamodharan, Sev and Grier, they believed the recent and the only factor to determine the effectiveness of layout is materials handling cost (MHC). However, most of the studies have considered materials handling cost only as the performance factor. Besides the performance of the layout, empty travel of material handling equipment, layout flexibility and area utilization also have a significant impact on the effectiveness of layout design. Therefore, Dhamodharan, Sev and Grier have developed three layout effectiveness factors in their research: facilities layout flexibility (FLF), production area utilization (PAU) and closeness gap (CG). By developed these factors, they hope to minimizing the manual handling cost, improving flexibility for arrangement and operation, utilizing the available area more effectively and minimizing overall production time. FLF defined as the ability of layout to effectively withstand various changes that arise from unceasing transformations in customers’ requirement and the enterprises’ internal disturbances. Nowadays, manufacturing enterprise should respond quickly with the uncertainty and changes in manufacturing environment. Yet, the flexibility factors cannot be measured precisely and modeled mathematically. Productive area utilization (PAU) involves the allocating the area required at appropriate location for various needed activities. The most important part of this research was discuss about closeness gap (CG) where it measures the extent to which the existing layout from the best theoretical layout in terms of closeness value. CG has measured in two levels: intra-functional level and inter-functional level. The flow among facilities within a department is intra-functional measurement while the flow among department within an enterprise is inter-functional level. They have also qualitatively justified the criticality of these factors the measurement of layout effectiveness. From there research, they recommended the current work can be convert from performance index to cost functions, which is self-justification factor in decision making process. [10]

Reconfiguration layout problem is needed when there have changes in product mix and volume. The main factors of reconfiguration layout problem is to minimize materials handling cost and ensure equipment can suit to new production mix and volume. Besides materials handling cost, relocations cost and stochastic performance measurement also needed to take in consider for reconfiguration layout problem. Minimize part cycle times and work in process inventory, reduce product lead time and rapidly response to changing needs and opportunities were the examples of stochastic performance. There have three physical layers as a reference model that relevant to the layout problem: product mix, machine types and locations on shop floor. Manufacturing system Performance Analyzer (MPA) is one of the models to estimate the stochastic performance measures of layout. Four phase approach have been discussed for design and analysis reconfiguration of layouts which included generate candidate layouts, estimate performance measures of layouts, determine layout to be used and refine selected layout. Meng and Heragu described that MPA is the most accurate and comprehensive analytical model used to evaluate the performance of layout. According to Meng, Heragu and Zijm (2004), MPA fits well into the reconfigurable layout framework [12].

**WORK-CELL LAYOUT AND CELLULAR MANUFACTURING SYSTEM**

Work-cell layout is much more suitable for manufacturing that produce low variety and high volume of product. Transformation of layout design to work-cell layout may increase the manufacturing efficiency; however, it is near impossible to restructure the overall layout of the company. According to Amine, Henri and Sonia, 50 % of facility’s total expenses able to be reduce by having a good placement of facility [3]. Work-cell layout may drive down the labour cost, increase the productivity and efficiency of worker, provided a better spaces for worker to communicate, decrease the amount of floor place needed and increases the machine utilization. Although rebuilding an entirely new facility may not be feasible, company still need to optimal the efficiency of production and service in order to remain competitive in market by redesign the work-cells and others section of the facility such as storage [5].

Cellular Manufacturing System (CMS) and work-cell is a central element of Lean Production. CMS is an approach to enable both, flow production and volume flexibility in machining. Joachim, Sven and Stefan using the example of milling, focus on the identifying relevant performance indicators to evaluate the economic fields of application of CMS. Therefore, an identification of application-criteria for an economic use of CMS is targeted. As a result, CMS enable an efficient and economic use to optimum both machine tools and operators. They advocated more activities should identify the economic boundaries to enhance future fields of application. To maximize the performance, few challenges will be encounter during the investigation for the next few years: quantitative evaluation of flexibility improvements, line balancing of machining process and the time taken for change-over procedures [13].

Applying work-cells layout will transform the manufacturing operating system to cellular manufacturing system (CMS) which increases the competitive advantage of company. Manufacturing firms aim to take the advantage of increasing in throughput, leading to product quality and customer satisfaction. According to Wemmerlov and Johnson, manufacturing firms who embrace modern philosophies such as Just-in-Time (JIT), total quality management (TQM) and time-based competition (TBC) use the principles of CMS [14]. Godfrey categories six major classifications of approaches to cell formation: array-based clustering, similarity coefficient, mathematical programming, graph and network, heuristic and combinatorial optimization. He believed similarity order clustering (SOC) algorithm which using the similarity coefficient method (SCM) to identify the relationships between pairs of machines is very useful, simple and effective to cell grouping procedures. Machine processing time, setup time per batch, part batch sizes, period demand for parts and time available per machine per period were the data that needed to determine the machine utilization [15].

Similarity coefficient method (SCM) is the approaches that wisely used to utilized machine-cells formation. SCM is simple, flexible and can lend to computer implementations. When there have an improper assignment of parts families during the process of rearrange, it may clash with the objectives of CMS. Average linkages clustering method (ALC) [16] and linear cell clustering analysis (LCCA) [17] have been applied to reduce the chance of improper machine assign; however, it is not enough to ensure the assignment of component between inter-cell and intra-cell is 100% correct. David has presented an algorithm that do not based on any technique of SCM which can solve the improper part-components assignment problem, identify and minimal the production of bottleneck parts and reduce the unnecessary intercellular movements. This algorithm minimize the flow between group by concentrates on arranging parts
among already-identify machine group rather than addressing the machine-grouping problem in general. David recommended practitioner on this algorithm can devote more time to find an efficient ways of handling bottleneck-parts that arise [18].

According to Arshia, Mir, Behzad and Ahmad [19] research, they consider the previous problems of array-based clustering methods and apply the idea of multiple attribute decision making (MADM) concept and technique for order preference by similarity to the ideal solution (TOPSIS) to solve the cellular manufacturing problems. The array-based clustering methods are based on the part-machine incidence matrix (PMIM). The initial problem PMIM is solve by TOPSIS and then improved by simple additive weighting (TOPSIS-IMP-SAW) and TOPSIS (TOPSIS-IMP-TOPSIS). They found that “TOPSIS-IMP-SAW” method is better in solving small scale of problems while “TOPSIS-IMP-TOPSIS” methods is better in solving large scale area of problems. IMP is abbreviation for improved [19].

Shahram and Napsiah [20] have proposed simulated annealing (SA) algorithm for improved layout design in cellular manufacturing systems (CMS) by comparing the computation time with benchmarked algorithm that developed by Wang, Lin and Wu [21]. SA is well-adapted in optimization of combinatorial problems. This algorithm produces solutions with less computation time and minimize both inter and intra cell manufacturing handling costs. As a result, SA algorithm produces better solutions with maximum of 0.08% error compared to 0.12% error in benchmarked algorithm. Hence, they proposed SA algorithm is better than benchmarked to solve layout problems especially when the size of problem increases.

Viviana and Harold have conducted a study of labor flexibility in cellular manufacturing systems by using simulation modeling. Two types of labor [22] flexibility are considered: inter-cell labour flexibility and intra-cell labour flexibility and they were classified depending on the operator’s mobility. This investigation is to explore the impact that using different layout allocation strategies on system performance by clarified the types of machine-operator assignments into dedicated, shared or combined assignment. Their research has considered the concepts of workload sharing, workload balancing and the present of bottleneck operations. As a result, the higher the sharing level between operators in different labour strategies, the cell performance tends to increase. 68% of performance have improved by comparing the results of dedicated assignment and shared workload assignment. The values for measurement of balance tend to be low since operator able to perform more tasks and workloads are more leveled at high levels of sharing.

A research that focused on more practicable and complicated problems that consider the three critical issues in cellular manufacturing system (CMS): cell formation, cell layout and intracellular machined sequence have been conducted by Chang, Wu and Wu[23]. In their study, two-stage mathematical programming model and two-stage Tabu search approach have been formulated and proposed. In two-stage mathematical programming model, the first state aim to solve the cell formation problem and cell layout problem while the final solution will obtain at phase two based on the state 1 result to determine the machine layout. The proposed algorithm can produce optimal solutions within a shorter time compare with others mathematical programming approaches.

Patrick and Isidro [24] have researched in the impact of application of Cellular Manufacturing (CM) in Maintenance Repair and Overhaul (MRO) on aerospace scope. Six aerospace businesses practice MRO were evaluated and founded that the application of CM to MRO were benefits in short turn-around-times and operational performance. They concluded all the businesses achieved benefits of developed continues improvement (CI) actions and build up a strategic on competitive advantages. Delivery times have reduced, unnecessary movement was remove, waste been determined and remove and enable business wide response to changing market conditions.

CONCLUSION

Several of researches have been conducted focusing on facility layout problems: factors that represent the layout problems, methods that use to solve the facility layout problems, methods to determine the effectiveness of layout designs and impact of reconfiguration layout problem. One of the popular facility layouts that been evolved and embraced by most manufacturing and service industries is work-cells layout. Many researchers have been conducted base on work-cell layout and cellular manufacturing concept. The researcher discover the work-cell layout have improved the competitive advantages of manufacturing firms, reduced manufacturing handling cost and work in process lead time and improved labour flexibility.

These researches have focus on the importance of work-cell layout, advantages of work-cells layout and the ways to improve the work-cell layout to be more efficiency, yet there should have a clear picture on negative sides of cellular manufacturing systems and the impact on manufacturing system performance.

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This study was a tutorial practice for undergraduate student, the first author. Responsibility of presented information is with the student. Research consultation and method teaching was with the second author. This study is supported by University Malaysia Pahang research grant (RUD130375).

REFERENCES


INTRODUCTION
Just-In Time (JIT) was a famous management strategy used in business manufacturing to reduce the cost by reducing the in-process inventory since the 20th century. JIT is a ‘pull system of production’ which actual orders will start to manufacture when order is done by customer. A demand-pull enables a firm to produce a goods or product in an actual quantity and at an actual time. This cause the stock level of raw material, work-in process inventory, finish goods inventory can be keep in minimum to eliminate the waste, remove variability and improve throughput. JIT was including JIT suppliers, JIT layout, JIT inventory and JIT scheduling [1].

To implement the JIT, the first condition is have stable and closed suppliers. A close relationships, stable and trust are the criteria of a successful JIT. There are few criteria of JIT suppliers should be concern to avoid the failure of JIT. Diversification of suppliers should be applied, so that the company have different vendor that can provide raw materials continuously. Besides, the suppliers should be located near to buyer. Therefore, the raw materials can send directly to the work areas in a short period. The quality of the raw materials also can be maintain and deliver on time.

In the implementation of JIT system, Heizer & Render [1] say that layout is also play an important role. It can reduce another waste which is movement waste. An action of movement which does not have additional value to the product is considered as waste of movement. Thus, a flexible layout that can reduce the waste of both people and material is needed for any company. There are few techniques had been suggested to all company about the arrangement of layout. Minimize the distance between the sources of raw material and the company; build a little space for inventory, and use flexible or moveable equipment that are benefit to the company.

According to Heizer & Render [1], JIT inventory is the minimum inventory necessary to keep a perfect system running. The major purpose of using JIT inventory is to reduce the inventory cost. When there are large quantity amount of inventory, extra space or a big store is needed to keep those inventory and it was an extra cost. Besides, large quantity amount of inventory hide the problem of the product such as scrap, setup time, quality problem and so on. As we reduce the quantity of inventory, the problem that exposed can be solved and the system can be run smoothly with a lower cost.

JIT scheduling is also an important component when apply the JIT system. An effective schedule can reduce setup time by meet customer orders, so that the time is reduced and cost is saved. A smaller lot size of inventory requires little cost to store and the setup cost is also decrease. Thus, the total cost also will lower when apply JIT system.

LITARATURE
During year 2011, there is a crisis of intense of global competition in the world. This affected many firm in various sector and force them to find out more opportunity to save the cost in every aspect for the firm. They tried hard to prevent being eliminated from the business world. Thus, JIT system was used extensively in the firm to overcome the cost problem as it considers as a powerful tool or system which can eliminate the wasteful cost and others. The relationship between JIT supply and JIT production was focused in find out whether these two components are interdependence or operating separately. Besides, it was also carried out to determine the relationship between the efficiency performance and delivery performance with the JIT supply and JIT production. Then, different hypothesis was carrying out to determine the achievement of system. Questionnaires and scale measurement was use to collect the data and sample. Result was finalized through the analysis of the data and sample.

As a result, JIT production was achieving the efficiency performance and delivery performance. However, the JIT supply does not achieve the efficiency performance and delivery performance. Thus, the research cannot be the supportive for the previous study as it has different result. In addition, the role of JIT supply is twofold, it interact with JIT production which is interdependence to each other’s. Therefore, the adoption of JIT supply can hinder for the low level and abolish the JIT production on delivery for extremely low level which stated by Danese, Romano & Bortolotti [2].

Jr., K. W., & Inman, R.A [3] was focused on the relationships among JIT-II selling, market orientation and organizational constructs. The relationship between the system, market orientation and organizational performances cannot be evaluated because JIT-II selling is
not widely use in the business world. However, there is an assumption which stated that the greater the market orientation, the higher its business performance. Besides, JIT-II strategy is emphasized on the relationships between purchaser and the vendors. In the production and marketing process, JIT seller has the ability to deliver the product in zero–defect quality, zero-variance quantity, and minimizes the total waste and total cost of an organization. As the quality of a product is improve, the market orientation of the organization will become more stable and the organizational performance will improve. In addition, JIT-II strategy strengthens the seller’s market orientation within the customer’s purchasing process. It was benefit to the buyer and seller due to the strong supply chain linkages. Seller who implemented the JIT-II strategy is not to fulfill the customer demand but it is to let the customer fulfill the demand that set by the seller. During implemented the strategy, sellers are involved in the new design of product through different and high technology techniques. Through the JIT-II selling strategy, seller can take immediate action which response to the demand changes of customer. In short, JIT-II selling is a market orientation strategy [3].

Nowadays, US manufacturing firms were declined gradually in the economic market and lost the competitive edge compare to Japanese firms. This is due the different view of management between the US firm and Japanese firm. Japanese firm firmly believe follow a doctrine which is quality should be aimed on the needs of customer and this doctrine brought them to achieve a world-class standard in the world.

In US, there are some firms implemented the JIT system and total quality management (TQM) while JIT focus on continuous improvement and TQM focus on quality of product. Even some firm does not implement JIT, TQM or both systems; they still can survive in the business world. However, for the firms which implement both the JIT and TQM have gain holistic benefit. For the firms who have implemented the JIT and TQM, the quality of product and productivity was increase compare to the firm who only implemented JIT. TQM system can contribute a quality standard improvement to the product while JIT can contribute the productivity level improvement to the firm. An increase of employee involvement and supplier participation was increase for both system compared to the firm who just implemented JIT. Thus, JIT and TQM can be implemented simultaneously in the firm which can bring much benefit to the firm [4].

China as the largest exporter and ‘manufacturing floor of the world’, but not every firm in China implemented JIT system. This is due to the organization ownership where the power is located in the top management. When there is no approval from the top management, the firm cannot apply the system. Besides, the organization and culture factor also play an important role in implementation. China was share many important common culture to others country, it can be the pioneer of the future firm in Asia. However, China was the biggest economic body in the world; the style of the management can bring effect to the western firm.

Different firm with different types of ownership will have different strategy to implement the system. This was become the problem for firm to implement it in organization. It can influence the organization performance of the firm; hence bring an effect to the organization. Ownership structures not only affect the organization performance and implementation of JIT, it is also affects the relationship between the JIT implement and organizational performance. Thus, a step-by-step approach should be applied to prevent the negative effect to the organization structure [5].

A successful implementation of JIT system cannot only depend on the JIT principles, but it should also depend on the way of implementation. The implementation of JIT has been more successful in Japan compared to the west, which indicates that Japanese and Western management are in different way. JIT in Japanese management was emphasized the elimination of waste in the total process from purchasing to distribution; however, waste mean increase in cost, but did not bring an additional value for the customer. Thus, JIT is view as a business philosophy rather than just a manufacturing process or tool for reducing the inventories.

According to Storhagen, N. G. [6], a project had done a comparison between companies in Japan and Swedish. This project was aimed to analyze the Japanese’s way of solving problem by means of logistics; compare to differences and similarities between Japanese and Swedish attempts to improve the logistics system; and develop knowledge of applicability and analyze the possibility of implementing JIT in Swedish industry. Besides, a basic assumption is developing which culture and tradition are not obstacles to implement the main part of JIT system in Swedish industry. A flow model, Japanese model and factor-matrix model was conclude based on the collection of the data.

The element of JIT are described and classified as process, interaction, structural and effect factors. Successful implementation of JIT has to start with process factor. Process factor are related to the human factors which focused on organizational change and development. Human resource management must be emphasis on the system to be successful. Interaction factors represent a network orientation and the structural factors are technique and methodological orientation while effect factors are performance measures and represent the results of the efforts of the other three groups of factors. The Swedish companies show a pattern of weak process factors, but comparatively strong structural factors. Thus, the key factor for the successful implementation is to establish a confidence among the people in the organization. The implementation of JIT must be brought in line with the condition both within the company and with regard to this environment [6].

According to N. Rajam Ramaswamy, V. Selladurai and A. Gunasekaran [7], JIT is a concept and philosophy rather than a technique. As the concept has developed a number of specific techniques and approaches, it has been absorbed into the general philosophy. Several researchers have studied and reported on the success of these techniques in large such industries but very rarely implement these techniques to small and medium enterprises (SMEs). In the survey study, there is no general pattern for implementation sequence was found and identifies the problem of implementation and operation of JIT. The researcher was classify the implementation barrier to two categories which are people related problem and technical problem. They conclude each company must provide education training to the employee to train their personnel to overcome the problem of cultural.
Buffer stock removal is the major area to be addressed (in three out of five case, it tops the list). Orders are seasonal and there is no repetition of orders, there is no speculative purchasing. Furthermore, issues such as preventive maintenance and multi-functional workers are well addressed in the system. Participation of employer and employees play an important role in the improvement of the system to indicate the resist of change. Therefore, education and cross training between employees is needed to reduce such resistance to achieve better performance for an organization [7].

JIT production system identifies the hidden problems in the value chain and reduces the production waste of the system while increasing the throughout. Even through the JIT system seems to be interesting and less complicated, it requires lot of coordination with supply chain to avoid delays in the production schedule. The opposite of the JIT production is known as JIC (just in case) system where it produces goods for inventory with the intention of having goods just in case a customer places an immediate order. Besides, JIT has evolved into a management philosophy containing a body of knowledge and encompassing a comprehensive set of manufacturing principles and techniques. Japanese firm tend to focus on enhancing the long-run competitiveness rather than emphasizing the realization of short-term profits. Stockholders and owners of Japanese companies also encourage the maximization of-term benefits. JIT management has a high degree of cultural aspects embedded in its development. The cultural differences which contribute most to this belief include the Japanese work ethic and the role of unions within many western work environments. JIT cannot be effective in firms outside Japan which has not been substantiated as several organizations that successfully implemented JIT. Besides, JIT manufacturing consist of several components or elements which must be integrated together to function in harmony to achieve JIT goals. These include human resources and the production, purchasing, manufacturing, planning and organizing function of an organization. In short, these elements can be grouped together into above-mentioned Toyota production system of people, plants and system.

Although the benefit of using JIT is numerous and cited more frequently than any potential limitations, several shortcomings have been identified. There are cultural differences have been cited as a possible limitation of JIT. These will be problems that may be difficult to overcome or work around without changes in attitudes and worker philosophy. Besides, the traditional approach to manufacturing involves the use of large inventories with safety stocks. This has the potential to cause problems for the organization which relies heavily on safety stocks to absorb any increases in demand. Furthermore, loss of team autonomy is a possible result of reducing or eliminating buffer inventories. Reduced buffer inventories and workers flexibility contradict the other aspects of JIT concerning quality circles. In addition, loss of autonomy over methods involves the idea that, under JIT, employees must adhere to strict methods of production in order to maintain the system. This idea diminishes the ‘entrepreneurial spirit’ which many workers may have previously enjoyed prior to JIT implementation. JIT success may be ‘industry specific’, i.e. craft-oriented businesses are considered to be better candidates for a JIT program than organizations producing commodity-type products.

There are some guidelines for implementation of JIT system was suggested. Long change over time, unleveled production schedules, highly variable production processes and others should be removed before implementing the JIT system. Fiedler et al. proposed two stage of process to implementing JIT such as prepare the plant and its people for flexibility, low costs, short lead times and high quality by concentrating on design; maintenance; quality; layout; set-up time and people. Another step is strived to produce zero lead-time with no waste by focusing on: total people involvement; visibility; process data collection; enforced improvement; flow scheduling and so on. Thus, it can be easier to implement JIT in the organization [8].

Recently, additional studies on JIT implementation in developing countries have been conducted [9]. Some organizations have failed to implement JIT concepts successfully due to a variety of issues. Ang [10] broadly classified the barriers that building professionals encountered into two categories: industry related problem and human related problem. There are limited supports from government, consultants, clients, and statutory boards do not promote JIT implementation in the construction industry. Oral et al [11] identified six common characteristics of developing countries and their likely impact on JIT implementation. There are implementation costs, costs of technology and maintenance, labor productivity and labor costs, inflation and the supply conditions, the demand conditions and lastly is culture.

However, there are few constraints of JIT implementation. Poor labor skills and insufficient training was hindering the implementation of JIT. Chinese construction industry is a highly labor intensive sector and most of the construction labor force is composed of peasants and unemployed workers, thus it can be easily recruited due to low requirement for skills. Another constraint is lack of project management experience. Previous studies have found that the project management skills in China are lagging behind those of developed countries. The limited management skills have prevented construction workers in china from working efficiently. Poor organization structure, unstable construction material prices and poor material management; supplier relationships, limited use of prefabricated components and others also is the hinder of implemented the JIT.

For further improvement, there are some recommendations for implement JIT in practice. Conducted training programs in JIT for top management to raise their awareness of the benefits that may be derived from JIT and consequently reinforce their commitment. In addition, reward and recognize those companies that have experimented with JIT implementation which can encourage another company to do so. Establish JIT consultancies to provide training or educational services to construction practitioners and facilitate the changes that JIT brings about to their company [12].

Five major constraints upon JIT practices are being proposed by two researchers in western countries and this was become a reminder to all organization as it want to implemented JIT system. The first constraints that propose are customer-driven and economic conditions. JIT practices face difficulties under certain economic environments. JIT does not fare well under raw material price fluctuations. The ability to commit JIT practices can also be diluted by other economic factors such as business cycle or by capital availability and costs. Furthermore, the rate of customer demand as well as the nature of customer expectations can also place limitations on the effectiveness of JIT practices and it was implicitly assumes a reasonably level rate of customer demand. JIT is even
less likely use traditional planning system to operate in a stockless manner. Further, while customers continue to dictate ever-higher levels of responsiveness and customization, this type of demand are also not well tolerated under JIT.

Second constraint is logistics. Interruption of material delivery along the supply chain can quickly affect manufacturing shutdowns and or finished goods shortages when insufficient raw material buffer stock is maintained along the chain. From some example, it suggest that removal of raw material buffer stocks along the supply chain may well be capturing immediate cost savings in exchange for increased risk of finished goods stock out as well as a greater overall cost should those stock out occur. Moreover, the longer the delivery lead time, the higher the level of buffer stock is required.

Third constraint is organizational culture and conditions. The well noted experience of Allen-Edmonds, a high-end American shoe manufacturer, exemplifies the important effect that the state of the organization can have upon successful JIT implementation. The company quickly discovered the piecework system (paying labor by units of production rather than by the hour) and JIT practices to be at odds with one another. Besides, improvement in delivery times and inventory levels were quickly achieved, however management was disappointed with the decreased worker productivity and eventually returned to the piecework system. Japanese managers have also experienced cultural constraints upon JIT as they globalize their supplier operations. They also found that other aspects of their organizational culture upon which they had to rely did not translate well across borders.

Fourth constraint is intractable accounting and finance practices. Traditional cost accounting systems can confound attempts to implement JIT practices in various ways. Cost accounting measures are typically cycled monthly or quarterly, while worker improvement efforts take place daily or even hourly. The traditional cost accounting focus upon direct labor cost is also problematic. It ignores the primacy of time minimization in JIT environment. Traditional financial practices also confound. If reducing inventory by half can be accomplished by some fixed cost, eventually, at some point, the proposal for further reduction of inventory will fall short of the hurdle rate imposed by financial staff. Yet JIT implementation typically has negative impact on short-term financial measures. Last constraint is small supplier difficulties. Small company cannot reap the same scale of benefits from JIT since they lack the economics of scale that their high volume, repetitive manufacturing customers possess. They are forced to purchase in much smaller quantities, and hold for less influence over their suppliers to reciprocate JIT policies, and so view themselves as the ‘whipping boys’ for JIT [13]. In sum, some arguments suggest that JIT actually raises global product costs; costs experienced by small suppliers and passed down the supply chain. It may be well argued that a significance portion of organizational savings due to JIT are captured, not as efficiencies, but as externalities [14].

Moreover, there is a problem with JIT system as the benefit and constraint is defined out. Raw materials are important for a company, thus an enough raw materials are needs to make sure the production can be continuous work to meet the customer demand. Consequently, an accurate, consistent quality and continuous supply raw materials need to production. Besides, a backup inventory should be prepared to avoid the lack of raw materials to produce product when customers order.

Researcher and practitioners indicated that several modifications to existing system should be undertaken prior to JIT implementation. There are four modifications method that propose such as modification of executive management, modification of engineering, modification of inventory management and modification of human resources. For the modification of executive management, JIT requires a modified approach by top management which may include significant modifications; such as designing an organization that integrates strategy with people to achieve the basic premise of JIT, elimination of all types of waste; reducing of specialization and organization functions, responsible to the quality of product, and development of management and employee’s commitment can be take action to continuous improvement. Example of the modification in engineering is minimize the work distance, standardization of product, change work center layout; standardize the work-in process, using total productive maintenance (TPM) as an integral part of a JIT system[15]; plus analyzing the operation in order to identified where standardization, simplifications and automation are needed [16]. Besides, reduce the number of supplier; change the policy of order, stabilizing production schedules on a daily or weekly basis and establish new procedures for dealing with supplies like defining the criteria for supplier base on quality, cost and timing is propose for better inventory management. Lastly, increase the job satisfaction of employee’s, increase the flexibility of work time, training employee’s, improving the skills of employee’s, training of management and employees to create an organizational culture consistent with the JIT philosophy; and build up a good relations with suppliers and improving communications between management and employees are can be due to modification of human resources [17].

CONCLUSION

Despite the advantages of JIT and constraints, there is many study had done by researchers which mainly focus on the problem of implementation of the JIT system. However, there is less study are concerned about the weakness or the problem of the JIT system itself. There are many constraint have been found out to implement the system while they do not notice that the system also have their own weaknesses. The insufficient supply of raw material in market can cause problem to the production line due to no backup of raw materials. Besides, there are a lot of methods to improve the JIT system. Modification of executive management, modification of engineering, modification of inventory management and modification of human resources can cover the weaknesses of the problem that exist in JIT system. More studies should be carrying out to tackle those constraints when JIT system is practiced. By improving the JIT system, JIT system can perform well in an organization and productivity can be increase. Therefore, further studies are required to cover the weaknesses of JIT. This may provide opportunity to others researchers to execute more research in this field and to merge with others modification effort that should be undertaken prior to JIT implementation; such as management, engineering and logistics modifications.
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Ergonomic Factors
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ABSTRACT: Ergonomic factors are the factors that are really important to be the performance basis. With a facility that meets the ergonomic standard workers and consumers will get gratification. Where to workers would settle workplace comfort and facilities to support the performance. The purpose of this study is to identify and analyze the available literature; to how learn ergonomic factors will influence the customer and employee satisfaction.

Keywords: Ergonomic factors; Satisfaction; Clinics;

INTRODUCTION
In demography development or growth in the number of students will be increased for each year. Polyclinic aims to enable students can get to know about their health during the university environment. For as in the learning process within the university will undergo a lot of accidents in the learning process or unanticipated events. Therefore the university clinic were made in order to minimize the increase in the level of seriousness of the accident or alleviate disease conditions was happening at that time who were among universities. Ergonomics is a branch of science that is concerned with the achievement of optimal relationship between workers and their work environment. Why do researchers need to conduct research focused on "The Ergonomic Factor Of Facilities University Polyclinic, About Satisfaction Of Student And Staff ". Which aims to find out what are the factors influence the level of student satisfaction or clinic staff satisfaction working at the clinic. There is also the factor that the facility would be quite vulnerable factor in achieving value on student satisfaction and the staff that works.

LITARATURE
Ergonomics is the science of learning other multidisciplinary science that bridges multiple disciplines and professional, as well as summarize the information, findings, and principles of each of these sciences. Science in question include physiology, anatomy, physiology, physics, and engineering. Ergonomics is the "science" or a multidisciplinary approach that aims to optimize the human - system work, in order to reach tools, ways and healthy working environment, safe, comfortable, and efficient. Ergonomics is the science, art, and technology practices to harmonize or balance between all the facilities that are used both in activity and a break with the capabilities and limitations of humans both physically and mentally so that the overall quality of life for the better. Ergonomics is the science of man in an attempt to improve the comfort in the work environment. Ergonomics is the science and application which seeks to harmonize the work and the environment against people or vice versa in order to achieve productivity and efficiency as high through optimum utilization of man - optimal .Ergonomics is the practice of designing equipment and details of the work according to the capabilities of workers in order to prevent injury to workers [2].

Human Factor & Ergonomic (HF&E) is employed to fulfill the goals of health and safety and productivity. It is relevant in the design of such things as safe furniture and easy-to-use interfaces to machines and equipment. Proper ergonomic design is necessary to prevent repetitive strain injuries and other musculoskeletal disorders, which can develop over time and can lead to long-term disability. Human factors and ergonomics is concerned with the "fit" between the user, equipment and their environments. It takes account of the user's capabilities and limitations in seeking to ensure that tasks, functions, information and the environment suit each user. To assess the fit between a person and the used technology, human factors specialists or ergonomists consider the job (activity) being done and the demands on the user; the equipment used (its size, shape, and how appropriate it is for the task), and the information used (how it is presented, accessed, and changed). Ergonomics draws on many disciplines in its study of humans and their environments, including anthropometry, biomechanics, mechanical engineering, industrial engineering, industrial design, information design, kinesiology, physiology, and psychology[4].

Ergonomics (of human factor) is the discipline concerned with the understanding of interaction among human and other elements of system and the profession that applies theory, principle, data and methods to design in order to optimize human well-being and overall system performance. The Human Factor & Ergonomic (HF&E) discipline has had a major impact in health care to help those help care leader, and managers understand the human mechanisms in medical errors and the influence of system characteristic on human behavior and human error. Improvement in work design are also necessary for many other health care job categories, for example by job dissatisfaction, stress, burnout, experienced by physicians [12].

The high incidence of musculoskeletal disorders (MSDs) among healthcare workers suggests that the introduction of ergonomic interventions could be beneficial. While laboratory studies have clearly documented the efficacy of ergonomic devices, few studies have examined their effectiveness in the healthcare workplace. This study suggests that ergonomic consultation and financial support for purchasing ergonomic equipment can be an effective intervention to reduce MSDs among healthcare workers [5]. This study evaluated the effect of a statewide ergonomic intervention program on MSD rates among employees among healthcare facilities. The interventions provided through this program were associated with decreased MSD rates. Comparisons among different types of interventions (i.e., reduction of bending, elimination of lifting, reduction of lifting, and a combination of the three) showed that each type of intervention was associated with decreased MSD rates. This study has a number of strengths. The sample size allowed us to
examine the results across facilities rather than individuals. The participating facilities were diverse in type, size, and location. Also, the injury data were collected repeatedly over a 2-year span of follow-up. All these characteristics enhance the utility and generalizability of our findings [5].

Adequate and appropriate exposure to light is critical for health and well-being of patients as well as staff in healthcare settings. A combination of daylight and electric light can meet these needs. Natural light should be incorporated into lighting design in healthcare settings, not only because it is beneficial to patients and staff, but also because it is light delivered at no cost and in a form that most people prefer. Most healthcare settings, as well as other buildings, are lit by a combination of daylight entering through windows and skylights and electric-light sources. It is important to understand how these two types of light sources differ to understand their relative impacts on human health and performance. Sunlight is electromagnetic radiation in the wavelength range that can be absorbed by the photoreceptors of the eye. Sunlight provides a balanced spectrum of colors with elements in all parts of the visible wavelength range. The actual wavelengths present in daylight vary over the day with latitude, meteorological conditions, and seasons. In contrast, light from most artificial electric-light sources, such as cool white fluorescent light and incandescent lights, are composed of wavelengths of lights that are concentrated in limited areas of the visible light spectrum, for example, yellow to red end or orange to red end of the spectrum [3]. Full-spectrum electric light sources such as xenon lamps and some filtered incandescent lights that have a spectral content similar to daylight, though their spectral content does not vary over time, are now available. Studies suggest that daylight is not inherently superior to artificial lighting for performance of most visual tasks. However, natural light has benefits over electric-light sources in regulating circadian rhythms and maintaining overall health. The most obvious effect of light on humans is in enabling vision and performance of visual tasks. The nature of the task as well as the amount, spectrum, and distribution of the light determines the level of performance that is achieved. Performance on visual tasks gets better as light levels increase. If the amount and distribution of light are controlled, most everyday visual tasks (such as reading and writing) can be performed as well under artificial light sources (such as fluorescent light) as under daylight conditions. However, daylight is superior for tasks involving fine color discrimination when it is provided at a high level without glare or any reduction in task visibility caused by veiling reflections or shadows [3].

The Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008, presents evidence-based recommendations on the preferred methods for cleaning, disinfection and sterilization of patient-care medical devices and for cleaning and disinfecting the healthcare environment. This document supersedes the relevant sections contained in the 1985 Centers for Disease Control (CDC) Guideline for Hand washing and Environmental Control. Because maximum effectiveness from disinfection and sterilization results from first cleaning and removing organic and inorganic materials, this document also reviews cleaning methods. The chemical disinfectants discussed for patient-care equipment include alcohols, glutaraldehyde, formaldehyde, hydrogen peroxide, iodophors, or thophthalaldehyde, per acetic acid, phenolic, quaternary ammonium compounds, and chlorine. The choice of disinfectant, concentration, and exposure time is based on the risk for infection associated with use of the equipment and other factors discussed in this guideline. Sterilization methods discussed include steam sterilization, ethylene oxide (ETO), hydrogen peroxide gas plasma, and liquid per acetic acid. When properly used, these cleaning, disinfection, and sterilization processes can reduce the risk for infection associated with use of invasive and noninvasive medical and surgical devices. However, for these processes to be effective, healthcare workers should adhere strictly to the cleaning, disinfection, and sterilization recommendations in this document and to instructions on product labels. In addition to updated recommendations, new topics addressed in this guideline include 1) inactivation of antibiotic-resistant bacteria, bioterrorist agents, emerging pathogens, and blood borne pathogens; 2) toxicological, environmental, and occupational concerns associated with disinfection and sterilization practices; 3) disinfection of patient care equipment used in ambulatory settings and home care; 4) new sterilization processes, such as hydrogen peroxide gas plasma and liquid per acetic acid; and 5) disinfection of complex medical instruments (e.g., endoscopes) [7].

There are many different types of ergonomics job analysis methods. These methods consist of various techniques for taking a systematic look at jobs and work tasks. They help you decide which jobs and specific tasks may contribute to problems. Once you know where problems may exist, it is easier to come up with ideas for making improvements. Some methods are relatively simple, and others require detailed analysis and sophisticated equipment. Checklists are generally a simpler, less comprehensive type of ergonomics job analysis method. More comprehensive methods break jobs down into specific movements (e.g., reach, grasp, place) or focus on the work environment (e.g., lighting, cold exposures). See the Resources section for references on methods that are more comprehensive than the checklist provided here [1].

Client satisfaction occupies an ‘intermediate’ step in establishing a healthy culture for evaluation within a program or a setting. It often follows process evaluation and cost analysis, and precedes outcome and economic evaluations. Accordingly, measures of client satisfaction lie somewhere between ‘process’ and ‘outcome’ measures. When the concern is with the extent to which clients are satisfied with the context, processes, and perhaps the costs of a treatment service or network, the relevant measures of satisfaction can be viewed as process measures. However, when the concern is with the extent to which clients view the program as having been helpful in resolving their problems, client satisfaction becomes a proxy outcome measure. Client satisfaction with treatment processes may both influence, and be influenced by, treatment outcomes. Clients who are not satisfied with a service may have worse outcomes than others because they miss more appointments, leave against advice or fail to follow through on treatment plans. On the other hand, clients who do not do well after treatment may have less than favorable attitudes towards a treatment service, even if it was of high quality by other criteria. In practice, these mutual influences may be difficult to disentangle. It is worth keeping in mind that satisfaction with the treatment processes, treatment compliance, and positive treatment outcomes are interrelated.

Client satisfaction ratings have been criticized as indicators of the quality of human services because they may reflect unrealistic expectations. While this criticism may be valid in some instances, research with clients of mental health services suggests that they can effectively discriminate between services that are different in quality. It is, however, important to recognize that evidence of positive
client satisfaction is not, in itself, sufficient to establish the effectiveness or accessibility of treatment. Clients with no base for comparison may be satisfied with services that are ‘ineffective ‘as determined by more objective outcome evaluations. On the other hand, clients may be displeased with services that achieve the objective of reducing their PSU but employ rigid or authoritarian approaches [9].

The “voice of the customer” refers to your process for capturing patient and stakeholder related information. Voice of the customer processes are intended to be proactive and continuously innovative to capture stated, unstated, and anticipated requirements, expectations, and desires of patients and stakeholders. The goal is to achieve customer engagement. Listening to the voice of the customer might include gathering and integrating various types of patient and stakeholder data, such as survey data, focus group findings, blog comments and other social media data, and complaint data that affect patients’ and stakeholders’ purchasing and engagement decisions. Clinics should solicit client comments regarding services provided and use such observations to improve clinic services. Clinics should create a method of soliciting these assessments that is appropriate, depending on the services provided to the client. Clients should be advised that their participation in surveys is voluntary. Customer satisfaction when a product or service meets or exceed a customer is expectation, the customer is usually satisfied.

CONCLUSION

Based on sources in the literature can be, the author can write the review of relevant literature as a reference guide in making research. So the study entitled "The Ergonomic Factor of Facilities University Polyclinic, About Satisfaction of Student and Staff ". Expected to provide an overview of the importance of factors ergonomics neighbor is in clinical environments that exist in the area overs. So the facilities are used within the university clinic can meet the standard ergonomic and then ergonomics can be a factor influencing factors on customer and staff satisfaction.

Ergonomics is the study of other multidisciplinary science that bridges multiple disciplines and professionals, as well as summarize the information, findings, and principles of each of these sciences. Science may include physiology, anatomy, physiology, physics, and engineering. Ergonomics (human factors) is the discipline concerned with the understanding of the interaction between man and the elements of the system and the other professions prevailing theory, principles, data and methods to design to optimize human well-being and overall system performance.

Measures client satisfaction occupies a ‘ middle ‘ in building healthy culture for the evaluation of the program or setting. Often follow the process of evaluation and cost analysis, and precedes the results and economic evaluation. Thus, the size of client satisfaction lies between ‘ process ‘ and measures ‘ results ‘. Client satisfaction ranking has been criticized as an indicator of the quality of human services because they may reflect unrealistic expectations. While this criticism may be valid in some cases, studies with clients of mental health services Effectively Demonstrate that they can distinguish between different services in quality. ”The Ergonomic Factor of Facilities University Polyclinic, About Satisfaction of Student and Staff “. Which aims to find out what factors influence the level of student satisfaction or contentment clinic staff working in the clinic. There is also the factor that the facility would be quite vulnerable factor in achieving value on student satisfaction and staff who work at the clinic.

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This study was a tutorial practice for undergraduate student, the first author. Responsibility of presented information is with the student. Research consultation and method teaching was with the second author. This study is supported by University Malaysia Pahang research grant (RUD130375).

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Service Quality and Its Relationship with Customer Satisfaction

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ABSTRACT: Nowadays, fast food restaurant grows very fast globally. This research is about study of customer satisfaction in the fast food restaurants. It aims to investigate the relationship between service quality and customer satisfaction. This study is using SERVPERF five dimensions to measure the level of service quality. By applying the service dimensions responsiveness, reliability and tangible in service quality, the level of customer satisfaction become higher. So, there is a positive correlation between service quality and customer satisfaction.

Keywords: Service quality; restaurant; satisfaction.

INTRODUCTION
Service quality is the consumer's judgment of overall service provided, also can be defined as the gap between consumer's expectation and actual service perceived [1]. Basically, service quality is about the customer's determinant for perceived service [2]. Consumers view the service quality in the aspects of the technical outcome provided, the process of the outcome delivered and the quality of surroundings where the service is delivered [3]. Next, companies that are able to implement these aspects well surely will deliver good service quality to the consumers. Besides that, service quality plays a vital role in the marketing field which need to servicing customers and many already broadly researched regarding this area. Service quality is included two different angles, customer voice out their opinion regarding the service that being provided [4] and an evaluation of aspect attainment with complex construct [5]. Due to today's restaurant grows like mushrooms after rain and got many competitors in the market, so in order to get piece of cake is very difficult, so many big corporation willing to spend money on to train their workers on services quality issues [6]. But, understanding which side of service that customer most care about is the most crucial part in evaluating a restaurant's service given. Service quality is difficult to evaluate by the customers because it is intangible, different customers have different evaluation regarding the services [7].

2. DIMENSIONS OF SERVICE QUALITY
According to [5] SERVQUAL is a model that being created to assess service quality which need to measure customer satisfaction from many side of area and more than one reason. The five dimensions that use to measure service quality are assurance, empathy, responsiveness, reliability and tangibles. The survey based on SERVQUAL in order to find out the breach between customer opinions and what they expect to get. SERVQUAL are commonly used by four serving sectors like banking, securities dealer, credit card companies, provide repair and maintenance shop [1]. Hence, all these company more to provide services and not in process of goods.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Definitions</th>
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<tbody>
<tr>
<td>Assurance</td>
<td>Assurance is the workers ability and polite help to create the customer to believe their good service and consume the service [8]. Especially important in the healthcare industry.</td>
</tr>
<tr>
<td>Empathy</td>
<td>Empathy is given much attention to each customer that dining in the restaurant like knowing their personal prefers taste [8]. The customer may feel that he is being treated like VIP. Empathy can use effectively like remember and providing the food that the customer's prefer taste and memories their names and needs. This is quite a useful strategies that always used by small restaurants to beat the large restaurants [8]. Thus can ensure the restaurant to have more loyal customers and bring profit to the restaurants to continue operating [9].</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Responsiveness is patient in hearing customer ordering and prepare the responsive service to which fulfill customer's need [8].</td>
</tr>
<tr>
<td>Reliability</td>
<td>Reliability is capable to carry out the service with precisely and steadfast [8]. For instance, restaurant prepares the food on time and send to customer dining table without delaying.</td>
</tr>
<tr>
<td>Tangibles</td>
<td>Tangibles can be obtained through evaluation of the surroundings and facilities in the restaurant. Like the dining condition comfortable, the staff are well trained, very polite and also the menu very attractive. [9].</td>
</tr>
</tbody>
</table>
3. SERVICE QUALITY MODEL

![GAP Model Diagram]

The GAP Model is also known as service quality model by [1], it is use to provide high level of service. In order to determine the five gaps which may lead to the service fail to deliver. Below are the models for service quality, determines about the causes in gaps between customer opinions and what they expect to get (as shown in the figure). All these include gap 1, gap 2, gap 3 and gap 4, while gap 5 is the complete goods. They are divides into two groups, customer and service supplier.

Gap 1: Information Gap. Gap between customer opinions and what they expect to get from the restaurant: This situation happen when the service that supplier failed to provide service that customer aims to.

Gap 2: Service Standards Gap. Fails to create or standardize the service that provided to the customer.

Gap 3: Service Performance Gap. Fails to deliver the satisfied services when there is no standardized close cooperation between people, right procedure and high technology.

Gap 4: Communication Gap. No good in management that leads to customer unsatisfactory. Not enough communication and give too much promise to the customers but till finally cannot fulfill.

Gap 5: Customer Gap. There is a different between the apex for the previous 4 gaps that customer expectations and customer perceptions are totally different.

4. CUSTOMER SATISFACTION

According to [11], customer satisfaction is the criterion that customer will evaluate while make decision on buying something. Customer satisfaction has played a prestige place in the market since long time ago that customer pleased with our services can bring lots of advantages to the corporations, like customer continuing consume the services which bring continuous profit [12]. In addition, if go further study, [13] got mentioned about the positive correlation between satisfactory customer service and not reluctant on paying more money. In this case, the explanation is customer who received the service which is reach the level of satisfactory, normally they are willing to pay more money for the service. Hence, many firms should place customer satisfaction as final goal because of its close relationship to the business achievement due to previous research [14]. Besides, [15] recommended that the service reach satisfaction because of the people provide service think on behalf the customer's needed like hearing their suggestions and provide the service that customer preferred. It is pretty vital to deal with customer's intuitive feedback whereas customers communicate with the waiters that provide service [16].

Customer satisfaction is build up of both emotional and cognitive rely to service being given. Service quality is the services that are given while the satisfaction is customer's judgment on the service. Customer judgment on the service depends on the population that consumed the service and other similar services that can replace the service by evaluate from various area [17].
Customer satisfaction is the something murky and complicated, it is difficult to measure although with research, it is more to something rare and need to explore [18]. Until now, there is no specific or most suitable method to measure customer satisfaction by researchers. Physically, customer satisfaction is an assessment by the consumers regarding the services or goods that being bought and using [19].

5. CUSTOMER SATISFACTION THEORIES
The title of customer satisfaction has played a very obvious place in today's marketing strategies. Scholars make researches on the structure of customer satisfaction with different types of theories like contrast theory [20], Expectancy-disconfirmation theory [21], assimilation or cognitive dissonance theory [22], equity theory [23] and value-percept theory [24]. For instance the most broadly used expectancy disconfirmation mentioning about customer satisfaction process. The hypothesis receives the level of satisfaction or dissatisfaction assessment from a customer regarding the service or goods that being provided and measure with forecast standards of performance. Regarding on observation, the forecast standards are guessing the customer's aims to get. Positive disconfirmation happens during performance is pretty good if compare to forecast the customer's aims to get. On the opposite side, if the performance is more terrible than what we expect, the negative disconfirm about the expectation and the customer is not satisfied. Alternatively, other impact theory that test for customer satisfaction is the equity theory. This theory has much satisfaction because customer get more profits if compare to their own cost (for instance, hard work, time and money). Perceived cost is suitable factor for checking customer satisfaction [25]. In addition, there is still a theory call three-factor theory, which is common used theory, given a fundamental of anatomy for customer satisfaction. The theory explains that three autonomous satisfaction factors affect customer satisfaction in unalike ways [26, 27]. Fundamental factors like dissatisfiers are basic prerequisites to fulfill satisfaction. If fail to fulfill the basic prerequisites may lead to unsatisfactory. In contrast, if successful fulfill or more than that also may lead to unsatisfactory. Moreover, excitement factors (satisfiers) gain customer to satisfaction but if not fulfill also will not create any unsatisfactory. Performance factors (hybrids) will create satisfaction if always performed but may create unsatisfactory if seldom perform [28]. This theory already assured by experience studies [29, 30] and also can give an extra outlook that concerning about the restaurant and also customer satisfaction on the ascribes. Furthermore, many minority points can be seen as requirements to create satisfaction. Always placed customers in top place is our responsibilities. Placed more effort like giving the services which suits well what the customers aims to get with making lots of analysis on that area. This may led the customers feel our sincerity and satisfy with our services. So, excitement factors are may be a surprise from customers like loyal to our service and recommend their friend to get our services [28].

6. THE RELATIONSHIP BETWEEN SERVICE QUALITY AND CUSTOMER SATISFACTION
Many researchers had studied the relationship between service quality and customer satisfaction [6,31,32]. Empirical findings showed that service quality is related to customer satisfaction [6]. Consumers who are satisfied with the perceived service quality eventually will lead to customer satisfaction. [23] indicated a product or service would create a favorable level of fulfillment which is customer satisfaction. Customer satisfaction directly influences behavior actions such as repurchases and recommends [33,15]. This means consumer's quality assessment will result in more emotive satisfaction. Hence, quality can be used as a key determinant to predict overall customer satisfaction.

7. MEASUREMENT OF SERVICE QUALITY
Service quality is identified through the differences between customers’ expectations of the service and their perceptions of the actual performances in SERVQUAL instrument [1, 5]. It suggests that a negative gap between perceptions and expectations will result in consumer dissatisfaction. In contrast, a positive gap will result in satisfaction. The higher the perception minus expectation score, the higher the level of service quality. The five dimensions identified as the main factors of service quality are tangibles, reliability, responsiveness, assurance, and empathy. Alternatively, the SERVPERF instrument developed by [31] included the original five dimensions and 22 items. However, the gap scales were replaced with perceptions alone to measure service quality. Higher adjusted R-square values were found for perception only scales across the four industries, which are fast food, dry cleaning, banking, and pest control. Next, the SERVPERF instrument was also validated in some studies in determining service quality. For example, [34] compared the weighted and unweighted versions of SERVQUAL and SERVPERF instruments by conducting a survey of fast food restaurant customers in India. They found that the SERVPERF scale is more effective in explaining the constructs and variations of service quality.

8. PREVIOUS STUDY
The study conducted by [35] was to analyze the effect of market orientation on service quality, customer satisfaction and loyalty. The sample of the study was 144 customers. Structural Equation Modeling (SEM) with AMOS was the method that used to analysis the data. The findings in the study consist: market orientation had significant effect on service quality; market orientation had significant effect on satisfaction; market orientation had no significant effect on customer loyalty; service quality had significant effect on satisfaction; service quality had no significant effect on customer loyalty; and customer satisfaction had significant effect on customer loyalty. The study done by [36] was to develop a conceptual framework for the effects of service quality on customer loyalty that reflects the mediating role of customer satisfaction and the moderating role of service recovery and perceived value, and applies it to the travel industry. The results in the study show that customer satisfaction is positively influenced by service quality, and customer loyalty is positively influenced by customer satisfaction. In addition, customer loyalty is indirectly influenced by service quality through the mediator of customer satisfaction. The relationship between service quality and customer satisfaction is found to be stronger for customers who have a positive experience of service recovery; and the correlation between customer satisfaction and customer loyalty is stronger for customers who perceive high service value.
The research conducted by [37] was to establish a scale to measure the perceived quality of Haidilao hot pot restaurant, and find the relationships among perceived quality, customer satisfaction and customer retention. The data analysis was carried out by the structural equation model and multiple regression analysis. The findings for both perceived service quality and perceived product quality significantly influence customer satisfaction; whereas perceived service quality imposes greater impact on customer satisfaction than perceived product quality. Moreover, customer retention is significantly influenced by perceived service quality and customer satisfaction, however there was no significantly direct effect between perceived product quality and customer retention. Empathy is the most important dimension of perceived quality to influence customer satisfaction and customer retention, which followed by service responsiveness and assurance, special product, service tangibles, and general product. [38] examined the relationship of service quality, customer satisfaction and customer loyalty in the Malaysian mobile telecommunication industry. The study adopts the five dimensions of SERVQUAL instrument and four additional dimensions, which was customer perceived network quality, pricing structure, convenience, and value added services to measure service quality. It shows that the dimensions of service quality such as assurance, empathy, customer perceived network quality, pricing structure, and value added services are positively influence customer satisfaction. In addition, customer satisfaction was significant positively influence customer loyalty in the Malaysian mobile telecommunication industry. Besides that, [39] conducted a research to investigate the influencing mechanism of individual investor's loyalty on China's securities industry. The data was analyzed by Structural Equation Modeling (SEM). The findings show that both customer satisfaction and service quality are the most important factor which affects customer loyalty. Customer satisfaction does not only affect customer loyalty directly, but also affects customer loyalty indirectly. But, the effect of customer expectations on customer loyalty is not clear. Another study by [40] designed a conceptual model for customer satisfaction and perceived value, as well as identifies the effect of service quality on customer loyalty in the restaurant industry. The results show that service quality is positively influenced customer satisfaction and customer satisfaction is positively influenced customer loyalty. In addition, customer loyalty is indirectly influenced by service quality through customer satisfaction. There is a stronger relationship between customer satisfaction and customer loyalty for customers who perceive high value than low value. Next, future research was also discussed in the study. Next, [41] investigated the relationships between hotel service quality failure, customer perceived value, revitalization of service quality, customer satisfaction and loyalty in the hotel industry. A survey was used to gather data from 105 hotel guests in Penang, Malaysia. The findings show that hotel revitalization of service quality had positive effects on customer loyalty; perceived value and customer satisfaction were two significant variables that mediated the relationships between hotel service quality and customer loyalty. The hotel service quality had indirect positive effects on customer satisfaction. The study also included some recommendations for future research. Moreover, [10] examined whether service quality of Indian commercial banks increases customer satisfaction that stimulate customer loyalty. Data were collected from 350 customers of scheduled commercial bank branches in Orissa (India). A questionnaire was designed regarding the aspects of service quality, customer satisfaction, and loyalty. Findings suggest that better human, technical and tangible aspects of service quality increase customer satisfaction. Human aspects of service quality were found to affect customer satisfaction more than the technical and tangible aspects. Customer satisfaction further customer loyalty. Increase in service quality of the banks can satisfy and retain customers. In the Indian banking sector, human aspects are more vital than technical and tangible aspects of service quality that affect customer satisfaction and customer loyalty. [42] investigated the relationships among service quality, perceived value, customer satisfaction and customer loyalty in mobile phone service. The respondents of the study include 384 mobile phone users from Seoul in Korea. The results show that service quality positively influences customer loyalty. Both perceived value and customer satisfaction positively affects customer loyalty. The customers with high perceived service quality, perceived value and satisfaction, lead to strong loyalty. The study conducted by [43] was to find the relationship between service quality, customer satisfaction and behavioral intentions across public and private banks in India. The results show that service quality is a significant determinant of customer satisfaction in Indian banking industry for both public and private sector banks. Different dimensions of service quality were found to be statistically significant across public and private banks. Customer satisfaction was strongly related with propensity to recommend.

9. CONCLUSION

Nowadays, since the economy growing fast, service quality that are provide yield an important relationship with customer satisfaction. For example, customer care about the staff attitude when ordering food in the restaurant, the dining condition also is the main key point for the restaurant to be grow in the market. SERVPERF is a powerful instrument in measuring service quality, but it is still a general instrument of service quality. Most of the previous studies propose that service quality positively influences customer satisfaction. However, different individuals may experience differently in the same situation. The style of individual perceives service encounter, is related to the experiences and cultural framework that the person brings to that event. Hence, it would be expected that perceptions of service quality would differ across cultures.

10. ACKNOWLEDGMENTS

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11. REFERENCES


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A Study of the challenge of sustainability

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ABSTRACT: This paper is to identify the challenge of sustainability of timber industry and rank the challenge of sustainability of the timber industry. With the result of the research, the timber industry owner can know which challenge is most critical and they can take some action on that challenge.

Keywords: timber industry, challenge of timber industry, sustainability issues of timber industry

1 INTRODUCTION
In Malaysia, timber industry is an important part of manufacturing sector. Although timber industry classified as low-tech technology industry, but it is one of the main drivers of Malaysia’s economic. The total export of timer product in 2011 is RM20.2 billion [1]. Since, the timber industry has contributed a lot to Malaysia country, timber industry have to sustain so that country can receive profit from export timber. But, to sustain the timber industry is not easy. There are some challenges that will affect the sustainability and supply chain performance of industry. The challenges can be resources shortage, waste, worker, transportation and others. In this paper, we will discuss the Malaysia timber industry overview, the important of sustainability in industry and challenges of sustainability.

2 TIMBER INDUSTRY OVERVIEW
Trades of tropical timber have boosted the economic growth of many south-east Asian countries in the past three decades. Malaysia is one of the large-scale harvesting timber resource countries during 1960s [2]. In 2008, the timber industry was the fifth largest export earner for the country and maintains its position as strong driving force within the industry [3]. The mainly export country are Thailand, Japan, republic of china, Singapore, Europe and Korea. Timber industry is a main supplier of furniture and other downstream manufacturing. The product make by timber industry is half finish product which is board, wood, sawn timber veer. Then, the furniture industry and other downstream manufacturing will use half finish product to make the final product such as furniture, plywood, cupboard, and door, and window, table and so on. In 2011, furniture and plywood was contributed 56% of the total export of timber and timber product [4]. Due to timber industry has a lot of contribution, timber industry have to maintain so that downstream manufacturing can continue produce the product and help country to get more income.

3 THE IMPORTANT OF SUSTAINABILITY IN INDUSTRY
Sustainability is an issue that will affect an organization’s performance such as financial performance and supply chain performance. Sustainability in the supply chain is increasingly seen among high-level executives because it will bring long-term profitability and has replaced monetary cost and value [5].

There are some factors that focus on sustainability and it can divide into three categories which is reducing risk and improving the financial performance of the supply chain, attracting customer who has value sustainability and making the world more sustainable. The most concrete action is reducing risk for the supply chain and improves the financial performance [5]. For example, Samsung Electronics has a target to reduce 3% of the water use per production unit by 2015 compared to 2011. Then, Samsung Electronic are operating on-site non-industrial waste water treatment and recycling facilities to reduce water use and sewage discharge. Treated water is used for gardening and fire safety system [6]. In this case, they can save the water cost by using the water treatment.

From the example, we can see that the sustainability can affect the financial performance and the supply chain performance. If timber industry can take Samsung Electronics Company as an example, performance of timber industry sure will increase especially in financial performance.

4 CHALLENGE OF SUSTAINABILITY IN TIMBER INDUSTRY
Malaysia is at the crossroads as far as the speed and direction that it should take is concerned. This is particularly significant in the case of traditional industry, such as timber industry. The afore said industry is now confronting with numerous issues and challenges to sustain their competitive advantage in the current new economy that is extensively driven by innovation and technological capabilities.

The quest to sustain the timber industry is not so easy because it has some challenges that will obstruct the performances of timber industry from becoming more competitive. Normally, the timber industry will face natural resources problems because a lot of forests are under protected and thus causing the natural resources to reduce in quantity. There also exist other challenges, such as shortage of wood material, financial problems, shortage worker, timber industry country’s competitor, waste management, transportation cost and price of timber.
4.1 Shortage Wood material
Shortage of wood material is a challenge to timber industry [7]. In Malaysia, timber is felling from natural forest. The harvesting of wood material from forest wood species which include merbau, meranti, nyatoh, keruing, jelutong, mersawa and so on. This entire forest wood species is a main raw material to the timber industry. Due to development of land and reduce state land forest, the logging activities would decline greatly. Besides, the sustainability environmental issue also will affect the logging activities. The table 1 is show the production of log (million cubic metres) in Malaysia [8]:

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRF</td>
<td>SL</td>
<td>Others</td>
<td>PRF</td>
</tr>
<tr>
<td>Peninsular Malaysia</td>
<td>2.95</td>
<td>1.71</td>
<td>2.77</td>
</tr>
<tr>
<td>Sabah</td>
<td>2.46</td>
<td>0.42</td>
<td>0.67</td>
</tr>
<tr>
<td>Sarawak</td>
<td>8.60</td>
<td>5.60</td>
<td>-</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14.01</td>
<td>7.73</td>
<td>1.08</td>
</tr>
</tbody>
</table>

Based on this table, we can see that the production of log is declining from 2000 to 2009 year. This is will strongly affect the timber industry operation. Without wood material, the timber industry can’t produce the product and the downstream industry will be affected. To solve the raw material problem, the Ministry of Plantation Industries and Commodities was implemented the forest plantation programs.

4.2 Financial problem
The timber industry is a high risk industry in facing of several issues facing in industry especially financial problem. Therefore, the timber industry is view as cannot sustainable in long term. During the economic depression in 2008/2009, some industry is serious lack of financial support and withdrawal of financial facilities. In the Malaysia Timber Council (MTC)’s Survey conducted in Dec 2008 to Jan 2009, 82% and 60% of the sawn miller and furniture manufacturers encountered difficulties in getting financial support from local banks.

Even the financial policies are adequate to support the timber industry, but the existing manufacture and new manufacture still facing the financial problem. For example: the small and medium companies in timber industry are unable to obtain loan from local bank because they can’t provide acceptable collateral to provide security for these loan. [9,10]. Second problem is the requirement to get the loan from local bank is too strict for the small and medium companies in timber industry. Besides, the maintenance cost also very high in timber industry. The maintenance costs include electricity and water bills, machine maintenance cost, transportation cost, repair road cost and so on. All of this maintenance cost will reduce the profit of timber industry.

4.3 Shortage Worker
The timber industry is a labour intensive industry and the work environment is considered as dirty, dangerous and dusty. This is the factor that cannot attract the local worker. To fill up the empty worker place, the industry has to find the foreign worker. Currently, the timber industry has more than 50% of foreign worker in total worker. In 2012, Mustaba said there are estimated 1.8 registered foreign workers in Malaysia [11]. Due to the high influx of foreign workers into the countries and creates social problems such as rape case and robbery case, the Government has adopted the policy of tightening and highly selective in the recruitment of foreign workers. The Government has a target to reduce the number of foreign workers in the country from 1.8 million to around 1 million in 2015 [12]. After launch this policy, many industry are facing worker shortage for its operation. The uncertainty of getting number of worker may force industry to cease the operation and downsizing operation.

4.4 Competitor of timber industry country
China is a top world exporter of wood product country. The increasing demand for low cost wood product is bring greater access to china country because the low labour cost and mass production factor in china. Due to this factor, the export of wood product from Malaysia will hard to sell. When the export of wood product is decline, the furniture industry will be adjusting their operation to limit the wood product. This will directly affect the production of timber industry. This is because when the furniture industries limit the wood product, productions of timber industry have to limited and timber industry will hard to survive. [13]

4.5 Waste management
In timber industry, there are many waste generated such as wood dust, solid wood, tree bark and core [14]. Wood waste is a big problem to timber industry because it needs the place to store the waste. But it is not an efficient way if we keep the wood waste. Normally the timber industries manage the waste by burning but it will pollute the environment such as air pollution. Due to environment sustainability by government and complaint from citizen, timber industry force to stop open air burning. After period of time, the waste will become more and lack of place to store the waste. Therefore, the timber industry companies have to find or rent the place to store the wood waste and it is consuming cost. If timber industries want to solve the waste problem, they have to find low cost solution such as sell the solid wood or recycle.
4.6 Transportation cost
Transportation cost is one of the challenges of sustainability in timber industry. Lorry is a main transport for timber industry. Every timber industry at least have 4 or 5 lorry, 4 caterpillar, 3 forklift to travel the raw material and delivery product to customer. This entire transport is easy broken because the wood is heavy and mountain road affect the body of lorry. The cost to maintenance this entire transport is very high because the spare part of the heavy transport is expensive. Diesel cost also will impact the financial report. Some companies’ financial report show that almost RM20000 only for diesel cost. If diesel costs combine with other maintenance cost in transportation, there is a big amount of money and it is a big challenge to timber industry.

4.7 Price of timber
Price of timber also is a challenge to timber industry. Due to decline of forest state land and the demand of timber increase, the price of timber is increase a lot from 2006 to 2011. The table 2 is show the list of price of timber [15]:

<table>
<thead>
<tr>
<th>Species</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balau</td>
<td>RM1,625</td>
<td>RM1,850</td>
<td>RM1,850</td>
<td>RM1,858</td>
<td>RM1,997</td>
<td>RM2,443</td>
</tr>
<tr>
<td>Merbau</td>
<td>RM1,175</td>
<td>RM1,200</td>
<td>RM1,228</td>
<td>RM1,246</td>
<td>RM1,358</td>
<td>RM1,822</td>
</tr>
<tr>
<td>Cengal</td>
<td>RM2,142</td>
<td>RM2,221</td>
<td>RM2,288</td>
<td>RM2,318</td>
<td>RM2,560</td>
<td>RM3,114</td>
</tr>
<tr>
<td>Mengkulang</td>
<td>RM790</td>
<td>RM790</td>
<td>RM800</td>
<td>RM794</td>
<td>RM827</td>
<td>RM1,093</td>
</tr>
<tr>
<td>Meranti Merah tua</td>
<td>RM797</td>
<td>RM831</td>
<td>RM858</td>
<td>RM860</td>
<td>RM912</td>
<td>RM1,190</td>
</tr>
<tr>
<td>Meranti Kuning</td>
<td>RM629</td>
<td>RM780</td>
<td>RM800</td>
<td>RM794</td>
<td>RM827</td>
<td>RM1,031</td>
</tr>
<tr>
<td>Mersawa</td>
<td>RM746</td>
<td>RM750</td>
<td>RM760</td>
<td>RM758</td>
<td>RM803</td>
<td>RM1,050</td>
</tr>
</tbody>
</table>

From the table above, we can see that every species of timber is increase price from 2006 to 2011 year. From 2006 to 2011 year, the price of balau increased 33.48%; Merbau increased 35.51%; Cengal increased 31.21%; Mengkulang increased 27.72%; Meranti dark red already increase 33.02%; Meranti Kuning increased 38.99%; Mersawa increased 28.95%. When the timber price industry, the production cost of timber industry will also increase and it will affect the sale of timber industry.

5 CONCLUSION
In conclusion, the timber industry has a lot of contribution to the Malaysia country. The sustainability is very important to timber industry because it can bring the benefit to the industry especially in financial performance. If timber industry can increase the financial performance, the timber industry will become more competitive than other timber industry. But, there have some challenges to timber industry if they want to increase the performance or become more competitive. Shortage of raw material and price of timber are the most challenges to the timber industry because these two challenges will affect the cost of the product. When the production cost high, the profit of the timber industry will decrease. Therefore, to sustain the timber industry or increase the competitive performance, it is not so easy.

6. ACKNOWLEDGEMENT
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6 REFERENCE LIST


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