

ANALYZING THE EFFECT OF PERFORMANCE KEY ENABLERS DURING FLOW OF INFORMATION IN BETWEEN TWO UNIT IN AUTOMOBILE SECTOR OF PAKISTAN

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Abstract- To understand the essential need with respect to the business strategy it is necessary to assess in the domain of performance Management. In most of the pervious study researches were more focused on non-financial factors that significantly used as indictor to evaluate the productivity less focus on the transparent information sharing across the inter departmental attribute. A brief study is conduct under the frame of performance criteria to adopt and integrates with organization strategic factors. In most of organization performance measurement were critical interface to predict the pre desire set of objective in order to achievethe strategic mileage. The Aim of this study used to highlight the significant performance enablers that used to put potential influenceduring the sharing the flow of information between two different department. In case of this study more formulated focus on production and procurement were emphasis that allows investigating the relevant variables used to measure the performance.

Keywords: Performance; Production; Procurement; Inventory; Rework; Loading.

I. INTRODUCTION

The Performance measurement is necessary to evaluate the significant impact on overall strategy of organizations among public or private sector firms. Performance management assessment allow companies to rectify there shortcoming and estimate there forecast to improve the overall efficiency and effectiveness within the organization. The most challenging element for the performance assessment is to analyze overall organizational strategy align with the multiple entities of performance indicator (Glendinning, 1981; Guthrie, April 2015; Tuly, 2010) . In most case public and private sector firms used to enable performance assessment mechanism as their trademark to ensure the adequate allocation of funds to the respective needs. The culture to adopt such practices used to maintain Audit index as transparent source to measure the performance and efficiency of companies. In most cases during evaluation of performance indicator a conventional approach would be taken by most of the firm's auditor by analyzing factors from financial domains. However, in our case most of our focus on factors which commonly associate with functional communication that connects manufacturing department with others during the production process. In most of the pervious study researches were more focused on non-financial factors that significantly used as indictor to evaluate the productivity less focus on the transparent information sharing across the inter departmental attribute (Sageder & Feldbauer-Durstmüller, 2019). In Traditional way the financial attributes were taken as short term goal while as far as the non-financial attributes is used to analyze the future estimation for performance (Crabtree & Debusk, 2008; Ittner & Larcker, 1998). According to the regional and global competitiveness pressure most of the manufacturing firms used to adopt the productivity improvement techniques such as TQM, BSC, EFQM, Lean Six Sigma, and implementation of such tool had significant outcome in term of measuring the overall performance. But the problem is how much adequate such techniques

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In order to validate the effectiveness of process improvement techniques decision makers required to understand the nature of the manufacturing multiple layer information flow. That enables the significant role in between the performance evaluation process and the gathered process indicator to optimize and scale performance parameter. As the nature of manufacturing function huge resilience face by the companies due to transparent flow of information related performance such as the production variation cost or process variation cost. In contrast of transparent information sharing this research also analyze the key variables that involves in formulating the performance measurement due to information sharing between production department and procurement department

This study analyzes the variables related to transparent sharing of information during the peak manufacturing cycle in context with performance management. Multi-Regression Model was applied to frame the effect on performance management. The primary data were collected from samples of 107 production managers and around 109 iterations were collected from the procurement managers at automotive sector in Pakistan, as focus on more over the integrated information flow in between two department 115 manufacturing companies respond among 113 companies as the nature of information (PAAPAM, 2021). The major implication of the formulated information analyze in context of performance management domain and the main focus on the variable or the attributes used as the shared data among two department were further addressed.

II. LITRATURE REVIEW

2.1 Performance Management in Domain of Production Unit

Study the most recent literature regarding to the performance or attributes used to highlight performance management indicator in production before that much focus what necessary to formulate the empirical aspect of performance management with a theme more resemblance toward the business strategic plane. André A. de Waal (2000) analyze some of vital strategic aim and vision that used to enhance the effectiveness to improve performance management in production or simple in other word production performance in domain with strategic goal (André A. de Waal, 2000). As with most convention approaches the most fundamental which shed the focus on the strategic goal is SMART (Strategic Measurement and reporting technique) used to interface a transparent information flow among the other business unit (Kurien & Qureshi, 2011). Henke and Quitt (2010) brought a attention to other approach known as performance prism its advocates the ingredients used to maintain and strengths the existing measurement procedure which were adopted to improve with respect to perception of customer and shareholder Robert Kaplan and David Norton (1992), revolutionize the existing performance management indicators specifically the nature multidimensional activities in production (André A. de Waal, 2000). It used to represent the multilayer approach to control and sustain the strategic vision and reposition the organization goal through centralized decision making system. Fitzgerald in (1991) used to formulate probabilistic approach to predict the performance related result and analyze the determinates of outcomes such system known as advance performance measurement Matrix (PMM) (Lin Fitzgerald, 2003). More synchronize approach used to develop by Ghalayin (1997) used to investigate the actives among three important element such as organizational management, process improvement team, and characteristic similar to the shop floor team and try to synchronize as integrated Dynamic performance measurement (Paul Rouse, 2003). Dong et al (2010) used to investigate that significance of quality management as result they concluded the observation that EFQM excellence model is not only used to sustain quality parameter; but it can also sustain the entire aspect of performance measurement indicators that were difficult to implement (Shahryar Sorooshian, 2016). The performance management as complete system with respect to complete functions of organization and last but not least organization operating environment, Waggoner et.al (1999) used to highlight the significant force that were used to influence and unable to evolve practice of performance measurement system these four element

categories as, the first organization internal management influence, external such as customer and shareholder, individual and synchronize process related issue and last one resilience to transformation (Felix T.S. Chan, 2003). Klassen and whybark (1999) as holistic approach in most of researcher used to advocate the performance measurement can be potentially used to resolve specific organizational problem and in that regard they used to suggest the specified frame work and specified Methodologies (Klassen, 2000).

2.2 Performance Management in Domain of Procurements Unit

Consider previous studies on procurement function seems to be considering as critical element for both production and finance function. If analyzing the core concept of procurement, this function contain numerous practices not just make to order to the supplier but there are several activities which has direct impact overall variation on performance management indicators such process duration and quality thus influencing on performance effectiveness and overall efficiency of procurement department. Daniel Knudsen (1999) were focus more on achieving the strategic goal in domain of performance measurement decision makers use to analyze and formulate the strategies use to adopt in procurement some of performance management matrix relevant actives are strategic feedback processes , diagnostic feedback , quantitative inputs for forecasting (Cartlidge, 2007). With span of time procurement processes and procedures changing strategies, there are many studies formulate on performance based procurement but less attention has been made more focus on side to analyze the supplier performance. Van weele (2005)examine some of the critical issue evolve during the measuring the performance in procurement because of the nature of the companies behaviors inputs and outputs relationship always under shadow Van weele identified the short term and long term KPIs that used to assess effectiveness and efficiency such as reduction of opportunity cost acceleration of flow of shard information overall market cycle (Weele, 2005). As procurement function carry strict activities of control and monitoring processes bundling of mix specific product planning in contrast of performance management and sharing of information wereused to increase the efficiency and effectiveness between production and procurement (Lotf, Mukhtar, Sahran, & Zadeh, 2013).

2.3 Shared information influence on both department

Most of the organization un-cascaded there transparent data sharing to other functions which cause severe consequences. It is necessary to match certain information in order to float the smooth decision making (Heisig, 2012). To create the detail map of production and procurement schedule some of transparent indicator used to exchange the valid information such flow contains number of useful information (Karel van Donselaar, 1997). The first one, the complete Bill of material which provides the complete set of information explains inventory status with respect to that how production can pull their demand to meet, second on time delivery depends upon the number of factors stored inventory, rework, value of productivity, order delay, and loading time and most important is lot size (Münch, 2015). Van weele and Knudsen (2003) suggested some generic information used among all manufacturing and procurement departments that includes: inventory, cost per order, effectiveness of delivery, supplier evaluation, solving error rate, supply chain cost effective processing time inventory, rework, value of productivity, order delay, and loading time by exchanging and relating such information flow between procurement and production units of organization helps to formulate the generic prospect of finding the most influential factors in order to optimize performance outcome which impact on overall performance measurement in order to achieve the strategic business goal (Głodziński, 2019). These studies granted a Model on the bases of elements used to coordinates among production and procurement and help to drive and map the effectiveness and efficiency for performance measurement Online survey and interview design and circulates among Manufacturing companies which used to facilitate for data collection.

III. MATHEMATICAL MODELLING

The research tool sends to 38 automotive registered companies in Pakistan. The primary data were collected from samples of 38 production and procurement managers and around 27 iterations were collected from the procurement managers at automotive sector in Pakistan, as focus on more over the integrated information flow in between two department (PAAPAM, 2021). A total of 34 companies responded out of 38 through email, some companies due to the nature of information they keep their confidential parameter and reply the reason not to respond to the information overall response rate is 24.14% this response consider the much moderate as compare to other study which is reported to similar in literature (Kumar, Ozdamar, & Ng, 2005; Lisboa, 2007). Considering the fact that it is really difficult to receive the complete response most of the companies unable to provide the transparent data even most of the companies were out of the shape that due to nature of the economy. It is really complex to analyze the preciseness of the iteration therefore the most of the people from academies and researchers led to believe that the complete outcome in response is enough to analyze on the desire model. There is no change on the characteristic on the significant nature of responded sample and non-responded sample therefore no significant change in terms nature of receive samples $\alpha=0.05$. This use to illustrate that chance of finding the ripple effect with respect to the data sample does not really exit is only 5%. In other this probability error is acceptable. A Sample of research questionnaire contain the useful data attributes which will soon use to formulate on the design model distribution of questionnaire responded by Managers of each departments some of the companies outsource their procurement function most of the Managers promoted from downstream most common error need to analyze as the perception of understanding the performance management under the domain of human resource and try to counter their argument according to it most focus were made a transparent information share which generally include eight attributes commonly use among production and procurement unit.

The adoption of research tool was drive from the empirical investigation of yeap chin chong related work on Malaysian local industry which use to analyze the remuneration based performance system, this research study used to highlight the generic prospect thus some of the ambiguities which was inconsistent nature of information regarding that some literature is added, In second layer this research based questionnaire to float among some of the people of academicians and professional consultant in order to oversee the leftover iterations. The final version of the tool is send to the 38 manufacturing companies to get the respond relevant to the attributes used to share among production and procurement has impact on performance Management. The questionnaire is designed on simple likert-type scale consist of five option

3.1 Mathematical Modeling

In order to predict the significant variable that is used to illustrated the influential probabilistic estimation regarding the critical information common in between the Production and procurement department for that purpose multiple regression analysis used to investigate the depended variable which are continuous in nature. Most of the researcher used to investigate the multi regression analysis to predict the comprehensive estimation. Cohen, Cohen, West, and Aiken (2013) Formulate the break through by analyzing stress experience by an individual person and with respect to the amount of illness suffer due to that stress. Powell (1999) used to estimate the probabilistic nature of the number of job experience in contrast to employee pay which is essentially depend up the number of female employee in the workplace in order to increase their pay rise. Ghosh (2014) Use multi regression model in order to analyze the food consumption of the different type fish spices. Coleman, Hoffer, Kilgore, Center, and Statistics (1981) Investigate the educational policy adopted in private and public school with respect to the student achievements. Weiner, Freedheim, Schinka, and Velicer (2003) Formulate chance of breast cancer patient for recommendation of mammography etc. In spite numerous application multi regressions. Required certain parameter to adjust

criteria set in this research is to formulate the gather information according to the scale of used in questionnaire and observed 5 independent variable that is directly made influence one depended variable in our case on time delivery is consider as depended variable, while the independent variable are Inventory, loading, order delay, productivity and rework, to analyze the impact over (OTD) on time delivery for that purpose 27 sample were collect of each independent variables IBM SPSS 22, Minitab 17 and Microsoft excel tool were used to valid the accuracy of iterations.

One step necessary to measure before formulated and analyze the complete observation it necessary to validates some critical test which used to align the information more towards the probabilistic estimation, there are two ways to conduct such evaluation; The first one correlation among independent value the observation because it effects the statistical analysis. The most important aspect if there is Multicollinearity among independent variable cause large R square in multi regression analysis none of the individual beta weight are statistically significant. As result bizarre beta weight estimates one thing is critical removing and addiction of one or more predictor variable result in enormous change to the model

Coefficient Correlations

| Model | | | order delay | rework | Inventory | Productivity | loading |
|------------|--------------|--------------|-------------|--------|-----------|--------------|---------|
| 1 | Correlations | order delay | 1.000 | -.084 | -.065 | -.188 | -.216 |
| | | rework | -.084 | 1.000 | .362 | .212 | .194 |
| | | Inventory | -.065 | .362 | 1.000 | .032 | -.151 |
| | | Productivity | -.188 | .212 | .032 | 1.000 | -.463 |
| | | loading | -.216 | .194 | -.151 | -.463 | 1.000 |
| Covariance | order delay | .000 | .000 | .000 | .000 | .000 | |
| | rework | .000 | .000 | .000 | .000 | .000 | |
| | Inventory | .000 | .000 | .000 | .000 | .000 | |
| | Productivity | .000 | .000 | .000 | .000 | .000 | |
| | loading | .000 | .000 | .000 | .000 | .000 | |

a. Dependent Variable: on time delivery

Table 1 : Coefficients Correlation

The worthiness of Multi collinearity test illustrate the adverse effect on Multi regression analysis as there are strong correction among the independent variable for that purpose correlation coefficient scale the value in between +1 and -1 this approximation defines the Pearson or monotonic relationship (Gravetter & Wallnau, 2007) in above case no independent variable having a strong resemblance among each other and according to the approximation its illustrate that independent variable with more absolute value drive strong relation between variable. If it is equal to zero it illustrate absence of relation and in Multicollinearity if the values of independent variables more or absolute toward a -1 that mean variable A has high value associated with the variable B lower value

ANOVA

| | Df | SS | MS | F | Significance F |
|------------|----|-------------|-------------|-------------|----------------|
| Regression | 5 | 0.015084993 | 0.003016999 | 812.5782119 | 2.78698E-23 |
| Residual | 21 | 7.79703E-05 | 3.71287E-06 | | |
| Total | 26 | 0.015162963 | | | |

Table 2: ANOVA

Analysis of Variance use to highlight the number of distinct values that independent variable can take one as result in different mean values of the independent variable in above case the ANOVA test used to express values against the critical approximation made by most of the researcher suggested on various cases the most critical is cronbach alpha (α) values in generally if the probabilistic estimation or the p- value associated with each independent variable is more less than suggested value which is $\alpha = 0.05$ then the chosen level of significance. This indicates independent variables close to that value or less that value has strongly contributor for significantly to measure variability in outcomes or on depended variable. As follow this approximation the according to data sample collected from the questionnaire the value of significance is much less than $\alpha = 0.05$ in above case significance $F = 2.7 \times 10^{-23}$ shows probabilistic estimation must be measure because the independent variables (INV, REW, PROD, ORDD, LOD) has significant variability in outcomes while keep in mind the sum of the square which used to calculate the total variability on overall mean value of data which is around 00.015084993 while the nature of availability of independent variable for purpose to calculate sum of square (DF= 5)

SUMMARY OUTPUT

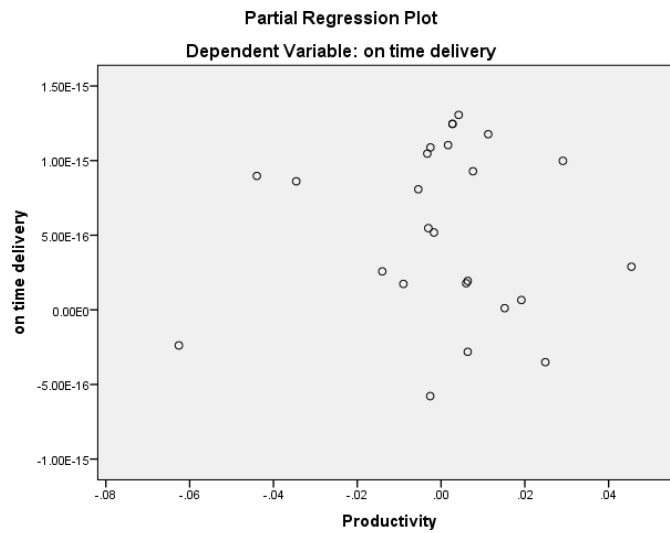
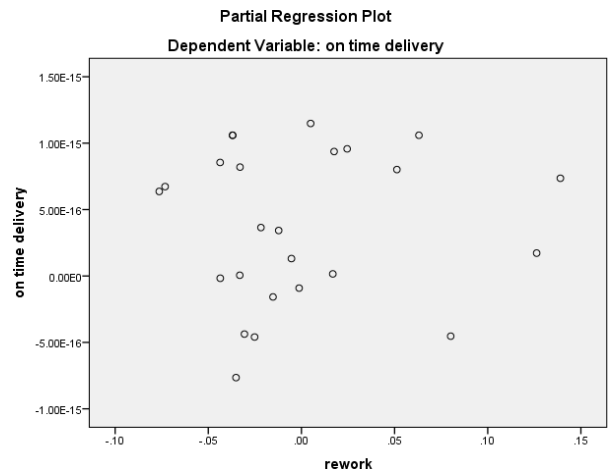
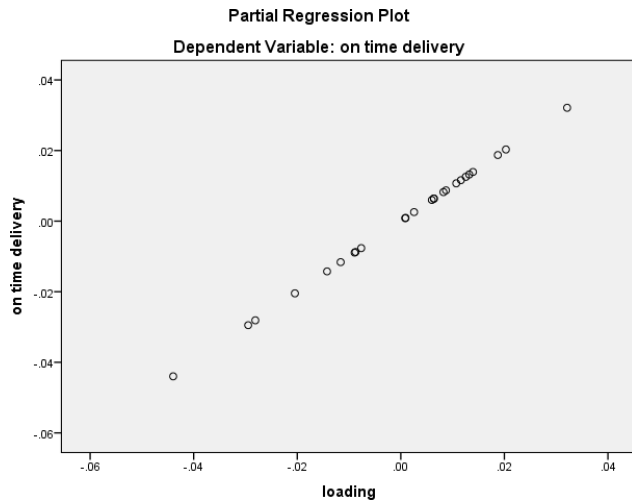
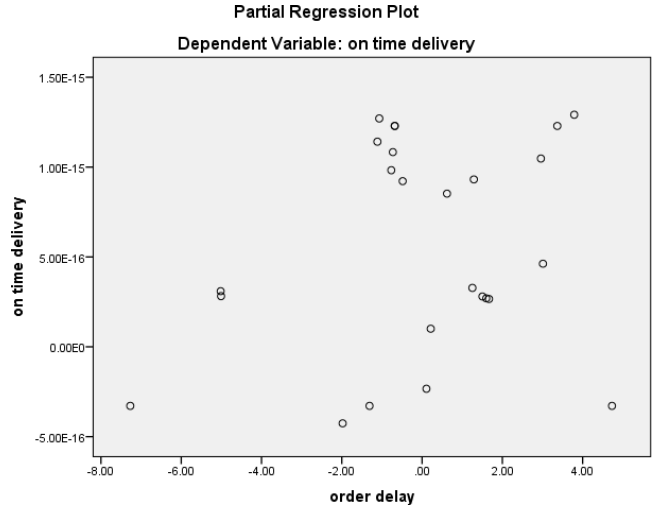
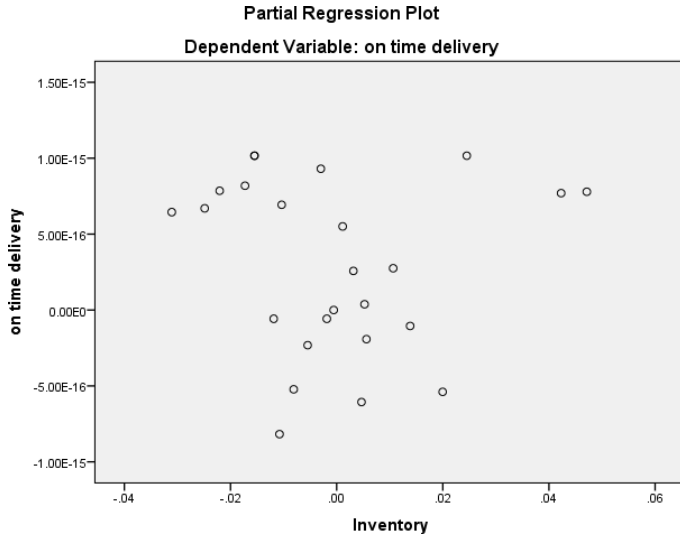
| <i>Regression Statistics</i> | |
|------------------------------|-------------|
| Multiple R | 0.997425609 |
| R Square | 0.994857845 |
| Adjusted R Square | 0.993633523 |
| Standard Error | 0.001926881 |
| Observations | 27 |

Table 3: Output Summary

For regression analysis illustrate that $R^2 = 99.48\%$ illustrate that independent variables (INV, REW, PROD, ORDD, and LOD) account 99.4r % of the variance on depended variable OTD (on time delivery) similar in case of Adjusted $R^2 = 99.36\%$ represent the total variability on OTD (on time delivery) is explain by (INV, REW, PROD, ORDD, and LOD)

| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> | <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95.0%</i> | <i>Upper 95.0%</i> |
|-----------|---------------------|-----------------------|---------------|----------------|------------------|------------------|--------------------|--------------------|
| Intercept | -7.883773538 | 0.180426011 | -43.69532703 | 4.18905E-22 | -8.258989966 | -7.50855711 | -8.25899 | -7.50855711 |
| INV | 0.002391073 | 0.020298434 | 0.117795936 | 0.907348773 | 0.039821831 | 0.044603978 | -0.0398218 | 0.044603978 |
| REW | -0.001227905 | 0.007091555 | -0.173150334 | 0.864191342 | -0.0159756 | 0.01351979 | -0.0159756 | 0.01351979 |
| PROD | -0.000160479 | 0.015592753 | -0.010291898 | 0.991885547 | 0.032587383 | 0.032266425 | -0.0325874 | 0.032266425 |
| ORDD | -0.000205008 | 0.000132212 | -1.550604095 | 0.135937089 | 0.000479957 | 6.99413E-05 | -0.00048 | 6.99413E-05 |
| LOD | 0.986968796 | 0.02112189 | 46.72729538 | 1.03808E-22 | 0.943043421 | 1.030894171 | 0.94304342 | 1.030894171 |

Table 4 : Complete Model Summary



Inserting the coefficients in the Multi regression equation, the final equation can be express as

$$OTD = \beta_0 + \beta_1 (INV) + \beta_2 (REW) + \beta_3 (PROD) + \beta_4 (ORDD) + \beta_5 (LOD) \quad [EQ1]$$

$$OTD = -7.88377 + 0.002391 (INV) - 0.00123 (REW) - 0.00016 (PROD) - 0.00021 (ORDD) + 0.986969 (LOD)$$

Overall summary even including scatter plot illustrate (LOD) loading time become one of the significant contributors among the in-dependent variable that illustrate the straight line in scatter plot that's influence of LOD would case variation as probabilistic estimation while insignificant in depended variable has no impact on regression process. Similar studies also conducted by Janak_Singh (1996) Analyses the activities within the supply chain and illustrates the importance of the relationship between goods movement and the exchange of information.

V. CONCLUSION

The transparent information shared among both departments depends on numbers of variable but for the purpose of adequate strategic goal and keep the effectiveness and efficient process flow six variable most common to anticipate between exchanging the protocol between both functional units most important process OTD (on time delivery) does get influence by number of factors with respect to the coherence and fit to goodness test five responded use estimates as potential contributors on the outcome Thus important components in performance management during the share information is concerned among both function of organization, on time delivery (OTD) get statically variant by Loading time(LOD) because it is only independent variable that significance or p value less than cronbach alpha (α)

The main goal that need to implement for both functional units regarding the pre amative approach is concerned to sustain the progress to achieve the strategic goal valuable effort required to improve the logistical procedure not only that frame work implemented only by the procurement unit but also overall lead time also matter that inputs depends on production unit. This study allows future researchers to get the maximum customer satisfaction, In loop process feedback mechanism need to deployed in both the department in order to sustain their performance mechanism to sustain the, Procurements need to map the flow not only for the customer On time delivery but also receive on time delivery required a supplier development process used to active dramatic change on performance balance card.

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