PRODUCTION PLANNING AND CONTROL MODULE AND PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

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ABSTRACT

The performance ofthe manufacturingcompanies over the past few years has beendecliningand inorder to address this trend, firms have focused on using information and communication technology in manufacturing process to innovate, increase productivity and improve resource efficiency. Enterprise Resource Planning system integrates business activities that allow for a smooth flow of information and interaction across all divisions. Previous studies have linked Enterprise Resource Planning system to firm performance and found diverse results.The objective of this study was to establish the effect of production planning and control module on performance of manufacturing firms in Nairobi County. Descriptive research design was used. The population of the study consisted of 533 manufacturingcompaniesinNairobiCountythatweremembersoftheKenyaAssociationofManufacturers.Krejcie and Morgan's formula was used to obtain a sample size of 223 firms and stratified random sampling was adopted. Data was analyzed using simple and multiple regression analysis with the help of SPSS version 25.0. Multiple regression analysis and correlation analysis were performed to examine the association between variables and hypothesis was tested using t-statistic at 5% significance level. With a regression coefficient of 0.709 and a p-value of 0.000, the studyfound that the production planning and control module had a favorable and significant impact on firmperformance.Thisinferredthattheusageofproductionplanningand controlmoduleimprovedtheperformance ofthefirm.Thestudyrecommendsthatfirmsshouldendeavortoacquireanduseenterpriseresourceplanningsystems, to promote organizational survival, efficiency, and overall performance.

Keywords: ProductionPlanningandControlModule,FirmPerformanceandManufacturingFirms**.**

INTRODUCTION

In the modern-day business world, firms are attempting to increase their competitiveness in global market that is

becoming increasingly challenging. As more firms continue to grow globally, competition and customer demands increasesand therefore, firmsmayneed to employinformationsystemssuchasEnterprise Resource Planning(ERP) systems to enable visibility, cooperation, and communication throughout corporate supply chains (Vermeulen*et al*., 2016). ERP system combines many business departments, including human resource, production, and finance into one tightly linked system with a mutual podium for information exchange across the whole organization (Beheshti, 2006). ERP modules that are widely used in manufacturing firms are production planning and control module, procurementmodule,financialaccountingmodule,materialmanagementandhumanresourcemanagement(Hasan*et al*., 2011; Katerattanakul*et al*., 2014; Madapusi& D'Souza, 2012; Momanyi, 2014).

Production planning and control module is a system module that plays an important role in assisting the firm production strategies, giving the organization the opportunity to have a competitive edge (Parto*et al*., 2016). This subsystem evaluates production demands in connection to the company's present inventory and suggests operating orders for the proper timing and volume to satisfy production demands. In a study byDhuongó (2017) revealed that differentaspectsofmanufacturingplanningcontrolwereadoptedandusedbythestudyorganizationsandthatmaterial requirement planning, production resource planning and capacity planning and control were widely used. The study concludedtheexistenceofarobustpositiveassociationbetweenbothoperationalperformanceandproductioncontrol and planning.

According to Pycraft et al. (2010), manufacturing firms are businesses that are engaged in converting inputs into outputs in the most practical and efficient manner possible to satisfy customers and meet organizational objectives. Majorityof manufacturingcompaniesinKenyaare membersofKenya AssociationofManufacturers(KAM).KAM represents value-added manufacturing firmsinKenya. The associationof wasestablished in1959 asaprivate sector organization.Bycommunicatingtheopinionsandconcernsofitsmemberstotheappropriateauthorities,KAMcreates connections for collaboration, communication, and government participation. Additionally, it encourages the development,adoption,andexecutionofsolidproceduresthatsupportachallengingbusinessenvironmentandlower the transactional costs. It also supports trade, investment, and standards.

KenyaAssociationofManufacturers(KAM)membersaredividedintotwelvedifferentsectors,includingminingand construction,foodandbeverage,furniture, woodproductsandtimber,chemicalandrelated,paperandboard,energy and electronics, rubber and plastics, textiles and clothing, footwear and leather, metal and related, automobile assembly and accessories, and medical equipment and pharmaceuticals. Were (2016) found that the strongest subsectors in formal manufacturing were food and beverages, textiles in Export Processing Zones (EPZs), pharmaceuticals, construction-related industries like cement, and metals, while the strongest subsectors in informal manufacturing were furniture-making and metal works. On the other hand, complex manufacturing industries includingautomobileassembly,electronics,and other technology-related manufacturing werethe weakestsectors in formal manufacturing

Nyekpunwo*et al*. (2019) in studying three beverage production companies in Nigeria, found that manufacturing control as well as the planning system was frequently adopted and applied by the companies and there was a connection between operational cost management and production planning and control system. Data from a sample of 97 staff members were gathered using a questionnaire and the study used descriptive research design. Production planningwasmeasuredbypercentageofmaterialplanningappliedfortheproduction, partofresourceplanningused fortheproduction,proportionofgrowthplanforproductionandpercentageofJITplanningappliedfortheproduction and reduced unit operational expenses. The study found that effective use of production planning and control accelerated beverage firms' overall growth through higher returns.
As per a report by the Kenya Institute for Public Policy Research and Analysis (2020), manufacturing industryis second-largestcontributortoGDPafteragriculture.However,themanufacturingsector'sproportiontoGDPhasbeen decreasing,from10%in2014to7.9%in2019(KNBS,2020).ThecontributiontoGDPfurtherdecreasedin2020 to 7.6percent(KNBS,2021).

AccordingtotheBigFourAgenda,themanufacturingsector'sGDPshareaimwastorisefrom9.2%in2016to15.0% in 2022. The sector's average GDP contribution in 2018, 2019, and 2020 was 8.0 percent, which is below the anticipated goal of 9.2 percent (KIPPRA, 2021). The sector's continuous decline in GDP contribution portrays a concerning scenario of attaining the policy goal of 15 percent GDP contribution by 2022, as suggested by the Big Four Agenda (KAM, 2021). Growth in the manufacturing sector dropped from 3.6% in 2018 to 2.5% in 2019 and declined further to -0.1 percent in 2020 (KNBS, 2021). The COVID-19 pandemic had a substantial impact on the manufacturingsectorandhadanegativeimpactonitsexpansion.93%ofmanufacturingcompaniesreportedadecline in sales, and 23% of those companies had losses of between 65 and 100 percent (KAM and KPMG, 2020).

Similarly, Dhuongó (2017) examined the 28 registered pharmaceutical firms in her study. The study dealt with how manufacturingcontrolandplanningaffectedtheoperationalsuccessoffirmswithintheNairobiregioninKenya.She discovered a significant positive association between production planning and control and operational performance. Data collection instrument was a questionnaire and the study adopted descriptive research methodology. The components of manufacturing planning and control systems were materials requirement and resource planning. just intimeandenterpriseresourceplanning.Thepresentstudyfocusedonmanufacturingfirmswhile Dhuongo's(2017) was on another industry, specifically focusing on pharmaceutical firms. This study placed more emphasis on operational performance than the current study did, which placed more emphasis on firm performance.

In addition, Adegbuyi and Asapo (2010) deliberated how the organizational productivity of a food and beverage company in Nigeria is affected by production planning and control system. The study found out that effective production planning and budgeting for improved organizational productivity. The study used experimental research designandacasestudymethodanddatawasgatheredusingaquestionnairefrom150respondentswhowererandomly chosen for the sample using a table of random numbers. Moreover, research by Umoh et al. (2013) on the relation between corporate productivity performance and production planning in the Nigerian manufacturing sector revealed thatproductionplanning had aconsiderableimpactoncorporate productivity. firms. The researcherspicked across-sectional survey design and to facilitate this, a sample of eighty (80) firms was obtained using stratified random sampling method. They then utilized both secondary and primary data to facilitate the inquiry. Secondary data was obtained fromthe company's financial statements as disclosed in the 2009 Nigerian Stock Exchange Factbook while theprimarydatawereobtainedbyadministeringaquestionnaire.Thesamplesizeforthecurrentstudywas223firms, whereas for this study was 80 firms. In addition, this study utilized an exploratory research design while the current used descriptive research approach.

METHODOLOGY

Thestudyadopteddescriptiveresearchdesign.Thestudycovered223manufacturingfirmsoutof553firmsinNairobi County. Stratified randomsampling was adopted. Data was collected using a questionnaire. Descriptive and Inferential statistics wereusedtoanalyze data.SimpleandMultiplelinearregressionanalyses werethenconducted usingSPSS software version 25.0 in order to address study objective. Assumption of linear regression model of normality, multicollinearity and heteroskedasticity were tested before analyzing data.

RESULTSANDDISCUSSIONS

Diagnostic Tests

TestforNormality

The normalityofthe study's variables was examined usingthe Shapiro-Wilktest because it isthe most powerful test fornormality(Saculinggan&Balase,2013;Yap&Sim,2011).Thenormalitytest statisticsfortheShapiro-Wilktest forproductionplanningandcontrolmodulewas0.962,whichwasgreaterthan0.05suggestingthatthevariablefitted a normal distribution.

MulticollinearityTest

IncidenceanddegreeofmulticollinearityifanywastestedusingVarianceInflationFactor(VIF)andtolerancevalues. The VIF value was 1.745 less than 10 and tolerance value was 0.573 above the indicative value of 0.1, therefore, multicollinearity was absent.

HeteroskedasticityTest

Thisstudyused P-P plot to determine ifthe residuals had constant variance because theyare best in the presentation ofspreadofresiduals.Theresultsindicatednospecificpatternandthewidthswereneitherincreasingnordecreasing as the variables rise. Therefore, heteroskedasticity is absent.

PairWiseCorrelationbetweentheStudyVariables

Correlationdeterminesthedirectionofarelationshipbetweenanytwovariables(Table 1).

Table1:Pearsoncorrelationbetweenstudyvariables

Variables	FP	PPC
FP	1	0.513
PPC	0.513	1

KEY:PPC-ProductionPlanningandControlmodule
FP-Firm Performance

The results show that the correlation coefficient between firm performance and production planning and control module was 0.513 and a p-value of 0.000 less than 0.05 showing the presence of a statistically significant moderate positive correlation between firm performance and production planning and control module. This suggests that an increaseinproductionplanningand control module would lead to statisticallysignificant increaseinperformance of manufacturing firms.

MultipleLinearRegression

A multiple linear regression was used to examine the relationship between production planning and control module and firm performance. A multiple linear regression analysis is represented in Table 2.

Table2:CoefficientsestimatesofProductionPlanningandControlModuleandFirmPerformance

Coefficients

Model1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std.Error	Beta		
(Constant)	1.007	0.180		5.591	0.000
Production planning and control module	0.709	0.096	0.513	7.414	0.000

R^2=0.263

a. DependentVariable:FirmPerformance
b. Predictors:(Constant),ProductionPlanningandControlModule

ResultsinTable2depictedthatproductionplanningandcontrolmoduleandfirmperformancehadapositivemoderate correlation(R=0.531).TheR-squared0.263infersthat26.3%ofthevariationsinfirmperformancecanbeexplained by the production planning and control module while 73.7% of variations can be accounted for by random error or other aspects left out in the model.F-value was 54.961 and a p-value of 0.000. Since the p-value is less than the significance level (0.05), the model examining the impact of the production planning and control module on firm performance was statistically significant.

The coefficient of production planning and control module was 0.709 implying that a unit change in production planningandcontrolmoduleincreasesperformanceofmanufacturingfirmsby0.709units.Theconstantofthemodel was 1.007 depicting the percentage of firm performance that is independent of production planning and control module.Thet-statistic was7.414atap-valueof0.000.Thenullhypothesiswastherefore,rejectedsincethep-value of 0.00 was less than the significance value of 0.05, and it was inferred that the production planning and control modulehasastatisticallysignificantpositiveeffectontheperformance of manufacturing firms.Thesefindings were in line with Nyekpunwo*et al*. (2019) and Dhuongó (2017) who found that production planning and control module had a statistically significant positive effect on firm performance.

Thefindingsimpliedthattheuseofproductionplanningandcontrolmoduleaidedinproperbudgeting,useandcontrol of resources in production process and automation of production processes hence efficiency in manufacturing processes. The simple regression model for effect of production planning and control module on firm performance was presented by the equation.

$Y = 1.007 + 0.709X_1$

CONCLUSION

The study concluded that the performance of manufacturing firms was positively and statistically significantly impactedbytheproductionplanningandcontrolmodule.Thissubsystemisimportantsinceitaidsinproperbudgeting and allocation of resources to production processes and hence efficiency in manufacturing processes.

RECOMMENDATIONS

Manufacturingcompanies,aswellasbusinessesinothersectors,shouldendeavortoacquireanduseenterprise resourceplanningsystemsinparticularproductionplanningandcontrolmodule,notjusttokeepupwithcompetitors, but also because of their importance in promoting organizational survival, efficiency, and overall performance. Inestablish the best systems, they should make sure that the appropriate modules are adopted to cover key company functions.

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