Factors affecting managerial accounting of production and business costs in coal mining enterprises in Vietnam

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Abstract
This study was conducted with the aim of finding solutions to improve the efficiency of production and business cost management accounting activities in a number of coal mining enterprises in Vietnam. This study uses two main research methodologies, "exploratory factor analysis" and "multivariate regression" to solve the research objectives. A number of new findings have been researched as a solid basis for solutions to enhance the effectiveness of management accounting activities on production and business costs in the coal enterprises mentioned above.
Keywords:*Managerial accounting, coal mining enterprises, production cost, business cost, factors effecting.*

1. Introduction

Vietnamese enterprises must contend with competitive pressure from both domestic company units in the same industry as well as foreign-owned corporations in the current stage of the country's economic growth. Vietnamese enterprises must make the most efficient use of their existing resources and make the most of positive influences from external forces, which include supportive policies of the government, such as credit policies, government investment books for key industries, and other favorable factors. When it comes to promoting the efficacy of corporate governance, it is essential for firms to employ effective management tools such as? Accounting and management accounting work in general, and management accounting in particular, play an essential role in giving valuable information to administrators in order for them to manage resource variables and make the most suitable decisions for their organizations.

After reviewing the current state of management accounting for production and business costs in coal mining enterprises, they only get as far as topics such as: developing cost norms, making estimates, producing and consuming, analyzing cost fluctuations, and cost calculation using the traditional method of calculation. During an actual study of 24 companies, the author discovered, among other things, that the management accounting of production and business expenses has received insufficient attention when it comes to the management of production and business activities of enterprises. The management accounting system for production and business expenses in corporations has not been focused on delivering meaningful information for the planning, organization, and operation of production and business operations in the past several decades. When it comes to expenses, it's all about preparing financial statements. There's no detailed study of the reasons or variables that influence costs, nor is there any information about cost-controlling mechanisms in place. While this is happening, managers in businesses want cost information to support the management process, make business choices, and build business strategies in order to help their organizations survive and thrive in today's highly competitive market environment.

In order for enterprises to build an effective management accounting system of production and business costs, it is necessary to conduct research into the factors that influence management

accounting of production and business costs. This research should be focused on business strategies that will ensure stable profits and long-term development.

2. Literature review

Scientists around the world are very interested in aspects that influence production and company cost accounting. The number of studies on the elements affecting production and business cost management accounting is limited, though. To investigate how various elements effect management accounting, production, and company costs, scholars around the world use a variety of methods and techniques.

"Adopion and benefits of management accounting practices: An Australian study," published in the journal Management Accounting Research, Vol. 9, No. 1, pp. 1-19, by Chenhall, R.H. &Langfield-Smith, K. (1998) explains why large manufacturing firms have higher rates of using modern management accounting, that is, the increase in organizational size will lead to better performance. Large businesses must use more sophisticated management accounting approaches.... Large companies frequently have greater information needs and financial resources to promote the adoption of more complicated management accounting methods.

Junjie Wu and Agyenim Boateng (2009) examined the Change in Chinese management accounting practice. With regard to joint venture partners' management accounting practices, multivariate analysis demonstrates that company size, international partnerships, manager and accountant expertise levels all have a favorable impact on the changes that take place. There is evidence that changes in management accounting methods are influenced by factors such as firm size and the understanding of top management. However, there is no evidence to support the premise that the Chinese government has a significant impact on the changes in joint venture and SOE management accounting methods.

According to Ahmad, K. (2012), a University of Exeter study examined the impact of five different factors on the implementation of management accounting methods in Malaysian small and medium-sized enterprises (SMEs). The following variables were discovered by a Kendall Tau correlation coefficient study of the data: It is also important to consider the size of the DN, level of market rivalry, and level of ownership/administrator commitment. In Malaysia's medium-sized businesses, advanced manufacturing technology positively influences the use of management accounting.

Factors Affecting Management Accounting Practices in Malaysia, by Sudhashini Nair & Yee Soon Nian (2017), looked at the impact of four different variables. The results of data analysis with SPSS software demonstrate that the variables of organization size and modern production technology have a beneficial impact on the use of management accounting in Malaysian companies. A company's use of management accounting is hindered by factors such as market competitiveness and the qualifications of accountants.

Rizwan Khan, Sidra Shahzadi and Maryam Toor (2018) "Impact on management accounting practices: a study of Pakistan" investigate the impact on management accounting practices that internal and external factors have. Organizational structure; Advanced manufacturing technology; Total Quality Management and the right product and quantity, right place and right time of production (JIT) have a positive impact on management accounting application in Pakistani enterprises. The results show that environment variables are not stable. Neither market competition nor competitive strategy have an impact on the use of management accounting in businesses.

The impact of factors affecting accounting in general and cost management accounting specifically is now being studied, evaluated, and approached in many ways by scientists around the

country. A number of theses, PhDs, PhD students, and typical research articles are synthesized by the author, as shown below:

According to Doan Ngoc Phi Anh (2012), the topic of "Research on images prefixes affecting the operation of management accounting in Vietnamese enterprises" has three grouping factors such as: level of competition, decentralization of management, and business performance with a proportional relationship to the operation of strategic management accounting in the company.

The factors that affect the operation of accounting in BinhDinh provincial enterprises were studied by Tran Thi Yen (2017), who examined 90 local businesses. found, variable's outcomes are as follows: Receipts from customers, users, users' controllers, and business operators have a direct impact on how management accounting functions in businesses. Everything else, including the school's varying level of competition, had no impact on the quality of the application work.

Nguyen Thi Ty Nhi's article on "Factors affecting the cost management accounting organization in manufacturing businesses in Ho Chi Minh City" was published in the year 2021. The authors have developed a research model with four impacts, prefixed by the company's size, and the system's user to create the total cost; this has been done by the writers. Application of technical information technology; competition. Four elements were shown to have an impact on cost management accounting firms, with the level of lowering influence increasing with each factor's importance. The authors propose a factor format to assist manufacturing companies in cost accounting systems to be more efficient. It's important to remember that sampling is still limited, and that results from this study will be used widely to evaluate how prefix effects affect cost management accounting in various Ho Chi Minh City-based manufacturing enterprises. Because of this, the rate at which unknown factors have an impact on manufacturing enterprises is relatively high.

3. Methodology

The author conducts research using both qualitative and quantitative approaches. Consider the variables that influence production and business cost management accounting in coal mining businesses in Vietnam with the help of industry experts. Testing and evaluating the effect of variables on the management accounting of production and business expenses in coal mining businesses in Vietnam was carried out with the help of the SPSS 22 statistical software package. The following tasks are completed as part of quantitative research: evaluating the regression model and running the tests (Test of partial correlation of regression coefficients, Test of model fit, Test of current multi-collinearity, autocorrelation and constant residual variance). The author conducts a survey of 230 managers at the senior and mid-level of 24 coal mining enterprises in Vietnam to determine the factors influencing the management accounting of production and business costs in the coal mining sector in Vietnam. The results of the survey are used to inform the author's research.

This paper presents relevant background theories related to accounting and management of production and business costs in enterprises, as well as a review of domestic and international researches, with a focus on the factors influencing the management accounting of production and business costs in enterprises. As a result of extensive deliberation and consultation with specialists, the study model contains 05 elements that influence production and business cost management accounting in coal mining businesses in Vietnam: (1) Characteristics organizational point of the enterprise's management apparatus; (2) Legal regulations on management and exploitation of natural resources; (3) Environmental cost management; (4) Qualifications of accountants; (5) Perspectives of business managers on management accounting of production and business costs.

From the expected research model and the results of discussions with experts, the author proposes 5 hypotheses that need to be tested, including:

Dependent variable: "management accounting for production and business costs".

Independent variables: (1) Organizational characteristics of the enterprise's management apparatus (OS); (2) Legal regulations on management and exploitation of natural resources (LR); (3) Environmental Cost Management (EC); (4) Qualification of accounting staff (AQ); (5) Perspectives of business managers on management accounting of production and business costs (MV). It is assumed that these factors all have a positive impact and have the same direction with management accounting of production and business costs.

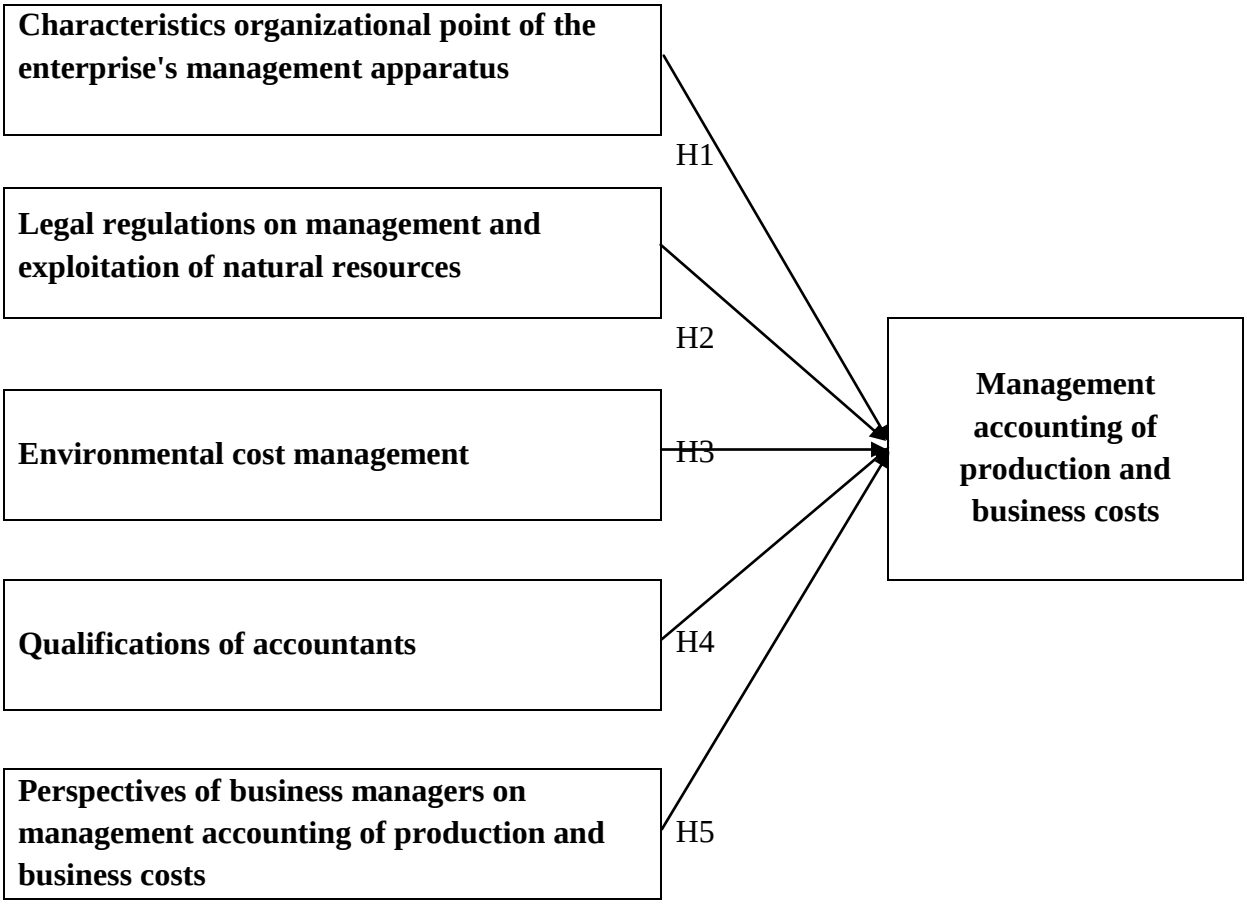

Figure 1: Factors affecting managerial accounting of production and business costs

The author has built the scales of the variables based on the existing studies in the country and in the world. The scales have been adjusted to suit the actual characteristics of coal mining enterprises based on the results of expert discussion in the qualitative research section. In the process of measuring and calculating data, SPSS software is also used to verify and analyze the following specific contents: Quality inspection of the scale; Evaluate the correlation between variables using KMO test and Bartlett's Test of Sphericity I; Linear regression analysis.

4. Determine the sample size for the study

Currently, according to aggregated data on the website http://investvietnam.gov.vn , there are about 107 enterprises operating in the coal industry by the end of 2016. In which, the leading companies in terms of production The production volume includes Vietnam National Coal - Mineral Industries Holding Corporation Limited (Vinacomin) (41 million tons), Dong Bac Corporation (3 million tons) including 24 enterprises, the remaining enterprises have small mining scale, mining output is small. Mining is not much or enterprises only buy and process coal, so the

author excludes from the sampling frame because the mining process is not stable, the data for research is still sketchy. In addition, during the implementation of the thesis, due to many reasons from the business side, the author could not access the enterprises as well as the data of the enterprises, so the author was also excluded from the research framework.

When using the SPSS analysis tool, it is necessary to determine the minimum sample size for the study to be reliable. The sample size used in the study was for Exploratory Factor Analysis (EFA) and multivariate regression analysis. According to Hair et al. (2009) quoted in Nguyen DinhTho (2013), to use EFA, the sample size must be at least 50, preferably 100. According to Tabachnick and Fidell (2007) cited in Nguyen DinhTho (2007) 2013), the sample size in multiple linear regression analysis depends on many factors such as the significance level, the strength of the test, the number of independent variables. According to Green (1991) and Tabachnick and Fidell (2007) quoted in Dinh Phi Ho (2014), the sample size can be determined by the formula: $n \geq 50 + 8k$, where k is the number of independent variables of the model. . In this study, the model has 5 independent variables, the official sample size $n \geq 50 + 8 \times 5 = 90$. According to Hair, Anderson, Tatham & Black (1998), determine the sample muscle based on the formula $n = 5 * m$ (n is the number of samples, m is the number of questions or the number of observed variables), in this study, the number of questions is 27 questions, the sample size is 135. After considering how to determine it sample size of researchers at home and abroad, the author found that the minimum expected sample size is 135

Based on the research scope of the topic, the overall study was determined by the author to include 24 coal mining enterprises belonging to Vinacomin and Dong Bac Corporation, each enterprise the author sends a ballot to the board of directors, chief accountant and staff of the accounting department, the planning department, the materials department, the labor and salary department to get opinions on the factors affecting the application of management accounting of production and business costs at the enterprise. The author has distributed 230 questionnaires to survey 24 coal mining enterprises in various forms such as sending questionnaires through google driver tool, mailing, emailing, zalo. As a result, 203 responses were obtained, in which 14 invalid votes were excluded due to the lack of responses to survey questions. Thus, there are still 189 votes qualified for quantitative data entry.

5. Result discussion

Experts in the field of research contributed to the development of the questionnaire, which has been changed numerous times since its first release. There were 230 surveys distributed by the author to 24 coal mining companies, including distributing questionnaires via Google Driver Tool, mailing, calling for transmission and communication, sending via email, and zalo. Fourteen responses were deemed invalid for lack of response to survey questions, out of the 203 total. After screening, the author tallied 189 votes and entered the quantitative data. Using SPSS software, the author calculated two reliability criteria (Cronbach's Alpha) and a total correlation coefficient (Corrected Item - Total Correlation) for each element after entering the survey data into the program. The following are the findings of checking the scale's quality:

Observed variables are used to calculate a factor called "Characteristics of organizational structure of business management." This factor has a Cronbach's alpha coefficient of 0.696, which is higher than 0.6 and has a larger Corrected Item-Total Correlation. 0.3. Because they establish a close association with Factor Organizational Structure Characteristics, it may be concluded that all observed variables are valid.

The results of quality inspection of the scale of the factor "Organizational Structure Characteristics"

Reliability Statistics

Cronbach's Alpha	N of Items
.696	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
OS1	9.7090	1.952	.393	.683
OS2	9.2963	1.603	.665	.515
OS3	8.8571	1.623	.481	.636
OS4	9.1058	1.904	.407	.676

Cronbach's alpha coefficient is more than 0.6 and the Corrected Item -Total Correlation of observed variables is greater than 0.3 when looking at the component "perspective of business managers on management accounting of production and business costs." As a result, the observed variables are considered valid because they guarantee a close relationship with the factor. Views of business managers on production and business cost management in accounting systems.

The results of quality inspection of the scale of the factor " Views of business managers on production and business cost management in accounting systerms"

Reliability Statistics

Cronbach's Alpha	N of Items
.734	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MV1	8.0794	2.563	.345	.761
MV2	8.3810	1.854	.589	.636
MV3	8.4550	1.834	.483	.710
MV4	8.6085	1.686	.725	.547

Five observed variables measure the factor "Legal regulations on resource management and exploitation," and the overall Cronbach's Alpha coefficient is 0.747 greater than 0.6, and the Corrected Item-Total Correlation of the observed variables are all identical. higher than a 0.3 threshold. This leads to the conclusion that the observed variables are valid since they have a strong association with the factor Legal regulations on resource management and exploitation.

The results of quality inspection of the scale of the factor " Legal regulations on resource management and exploitation"

Reliability Statistics

Cronbach's Alpha	N of Items
.747	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LR1	13.4762	3.847	.464	.722
LR2	13.3704	3.766	.544	.690
LR3	13.4762	4.017	.473	.716
LR4	13.3069	3.778	.555	.686
LR5	13.2698	4.060	.531	.698

Accounting qualification is assessed by four observable variables, with an overall Cronbach's Alpha coefficient of 0.874 (more than 0.66), and an Item-Total Correction Correlation (higher than 0.3) for all variables. Because of this tight link with the component of Accountant qualification, the observed variables are acceptable.

The results of quality inspection of the scale of the factor" Accountant qualification"

Reliability Statistics

Cronbach's Alpha	N of Items
.874	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
AQ1	9.0317	3.276	.637	.873
AQ2	8.8677	3.041	.721	.842
AQ3	8.9312	2.905	.784	.816
AQ4	8.8519	2.999	.779	.819

Overall Cronbach's alpha (a measure of reliability) is 0.792 (a number larger than or equal to six), and the corrected item-total correlation (a measure of reliability) is greater than or equal to three. Because of this close link with the environmental cost management component, it may be concluded that all observed variables are valid.

The results of quality inspection of the scale of the factor" Evironmental cost management"

Cronbach's Alpha	N of Items
.792	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
EC1	13.5820	4.021	.504	.778
EC2	13.3333	3.989	.598	.743
EC3	13.3492	4.218	.593	.747
EC4	13.2857	4.386	.559	.758
EC5	13.2222	3.876	.619	.736

The Cronbach's Alpha coefficient is 0.806, which is better than 0.6, and the Corrected Item-Total Correlation of the relevant variables is all greater than 0.3 for quality control on the "management accounting of production and business costs" scale. As a result, the observed variables are deemed valid since they closely correlate with the dependent variable of management accounting for production and business costs.

The results of quality inspection of the scale of the factor" Management accountitng of production and business costs"

Reliability Statistics

Cronbach's Alpha	N of Items
.806	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
AMC1	11.8995	2.389	.578	.774
AMC2	11.8889	2.472	.606	.765
AMC3	11.8677	2.466	.590	.770
AMC4	11.9153	2.525	.580	.773
AMC5	11.8783	2.469	.607	.764

After verifying the quality of the scales of the observed variables, they all ensure the reliability to measure the factors they observe. The author uses SPSS 22 software to test the suitability of EFA in turn. After running the data, the result tables are as follows:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.751
Bartlett's Test of Sphericity	Approx. Chi-Square	1621.138
	df	231
	Sig.	.000

Based on the results of the table above, it shows that the KMO (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) coefficient is 0.751, meeting the condition $0.5 \leq KMO \leq 1$. This means that the factor analysis is exploratory. is completely appropriate. The Sig coefficient of the quantity Bartlett's Test of Sphericity equal to 0.000 satisfies the condition that it is less than or equal to 0.05, helping to draw a firm conclusion that the results of exploratory factor analysis (EFA) are completely significant, the observed variables correlated and converged to explain the factor.

Regression coefficient test

Multiple linear regression results

The results of multiple linear regression analysis are presented in the following tables:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.821[a]	.674	.665	.22191	1.880

a. Predictors: (Constant), EC, MV, OS, LR, AQ

b. Dependent Variable: AMC

Based on the model summary table, the Adjusted R Square coefficient is 0.665. This number is explained as the independent variables in the research model affecting 66.5% to the change of the dependent variable. The remaining 33.5% is due to the influence of variables outside the model and due to random error

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.605	5	3.721	75.560	.000[b]
	Residual	9.012	183	.049		
	Total	27.617	188			

a. Dependent Variable: AMC

b. Predictors: (Constant), EC, MV, OS, LR, AQ

The result of Sig coefficient in the ANOVA table gives a result of 0.000, which meets the requirement that the sig coefficient must be less than 0.05. The conclusion is that this factor model has broad implications

After that, ,The author analyses the regression model to see if the dependent variable AMC has a straight line connection with the independent variables (OS, MV, LR, AQ, EC). The end result is as follows:

According to the data in the table above, the following are the main contributing factors: Organizational structure characteristics (OS factor); manager's viewpoint (MV factor); point of view (POV); LR factor – Legal regulations governing natural resource management and utilization; Factor AQ – Characteristics of the organizational and managerial structure, the environmental cost management (ECM) element has a p-value of 0.05 in the analytical model. To summarize, these five variables have an effect on coal mining companies' management accounting of production and business costs. There is also no evidence of multi-collinearity because the VIF coefficients are all less than 2.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.250	.174		-1.432	.154		
	OS	.119	.043	.131	2.757	.006	.857	1.274
	MV	.264	.039	.310	6.707	.000	.785	1.197
	LR	.190	.038	.237	4.989	.000	.836	1.262
	AQ	.207	.031	.308	6.636	.000	.793	1.205
	EC	.260	.035	.335	7.350	.000	.830	1.167

a. Dependent Variable: AMC

Test for constant residual variance

The frequency graph of the normalized residuals is used by the author to verify that the residuals are normally distributed. We can get this conclusion by looking at the graph's mean and standard deviation. As a result, the absolute value of the regression-standardized residuals is significantly correlated with the independent variables, with a Spearman-rank correlation greater than 0.05. As a result, it is safe to make the assumption of constant variance.

6. Conclusions and recommendations

The results of EFA study show that the research model of management accounting of production and business costs in coal mining enterprises has explained 66.5% of the impact on management accounting of production and business costs. by 5 representative factors, the remaining 33.5% is lost by other factors that have not been detected.

Coal businesses' managerial accounting ofproduction and business costs were examined, with the results integrated and assessed. Researchers found that 05 variables significantly affect coal

product production and trade costs accounting activities. It's a good starting point from which to make the following recommendations.

Improving the organizational structure of the enterprise apparatus: Organizational survival and growth are directly influenced by the effectiveness of the management apparatus, which serves as the brain center for all activities. Coal mining companies currently have a complex organizational structure with numerous divisions. The author makes the following suggestions for improving the management apparatus's organizational structure in coal mining companies: Organize and reorganize departments' functions and officials so that no functions are missed. educating and developing management employees in accordance with the new mechanism's needs Organize employee training, develop a strategy, and standardize procedures. Creating and enhancing an organization's culture.

Raising awareness of business managers about management accounting of production and business costs: Company owners, executives and accountants all need to understand the significance and advantages of managerial accounting, particularly that which pertains to production and company costs. Managers must examine and make use of suitable information based on management accounting information. managers must also consider management accountants' information needs in their plans. Afterwards, managers will have business development plans and strategies, as well as other business management measures, through short- and long-term planning.

Completing legal regulations on management and exploitation of resources: This industry must abide by state regulations, such as the Natural Resources Exploitation and Protection Act, environmental protection legislation, auction laws and other rules and regulations. rules pertaining to environmental impact assessments, workplace safety, fire prevention and explosives storage laws, and other such issues. Any violation of the aforesaid laws and regulations by coal mining companies will result in a ban, a stop or a suspension of mining and processing, as well as substantial consequences for the company's output and operations. As a result, company executives must stay abreast of new legislation and make sure that no errors are made by the company's staff. In order to avoid problems affecting their production and business activities, companies must train a team of employees that specialize in managing legal documents and procedures relevant to the industry.

Improving the qualifications of accountants: For accountants to do their duties effectively, companies must allow them to attend classes and intense training courses on management accounting and cost management accounting. Enterprise cost accounting has a lot of material and is quite effective. Incorporations must train their accounting staff in management accounting by bringing in experts and lecturers with management accounting experience, as well as using management accounting models and production and business cost management accounting that have been successfully implemented in organizations outside of the industry as a whole. In the 4.0 technology era, organizations want personnel that are knowledgeable in information technology as well as accounting skills to operate the system most efficiently and effectively.

*Improve environmental cost management:*Recognize coal mining's environmental protection activities and the wastes that result in environmental costs; laying the groundwork for the development of funding sources and the formulation of environmental spending strategies; Make a yearly environmental cost plan based on the projected level of environmental funding from the master plan. Environmental cost control based on production stages, activities and production objectives; and, Stakeholders are concerned about the environmental costs.

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