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EFFECTS OF PRODUCTION COMPLEXITY AND COMPETITION LEVELS ON THE IMPLEMENTATION OF ACTIVITY BASED COSTING IN PHARMACEUTICAL COMPANIES

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ABSTRACT

Despite its advantages over traditional pricing systems, the ABC system is still not extensively adopted, and it has thus been a focus of discussion for scholars for examination and, eventually, acceptance. Because of the reduced level of ABC adoption, various scholars have conducted empirical studies on it to explore the impact of the firm's characteristics and surroundings on its dissemination and the elements that determine its success. Much empirical research has been conducted in Western or Industrialized countries, with relatively little research conducted in emerging countries, particularly in Asian contexts. Few studies have been conducted in India, as in other Asian nations, to explore the prevalence and the use of ABC systems. The study's main goals are to analyze the company's features and environment elements that affect the adoption of the ABC system, as well as to analyse the influence of behavioural and institutional contexts on ABC success in pharmaceutical enterprises in Odisha. The factor analysis revealed that the most important reason that has discouraged pharmaceutical enterprises in Odisha from embracing ABC was that they confront certain innate problems in the process of the ABC system, such as the difficulty of the ABC system is the lack and high cost of advisors, followed by trust in the currently used cost systems.

KEYWORDS: ABC System, Pharmaceutical Companies, Production Complexity.

INTRODUCTION

In present era of automated processes and intense competition, it is necessary to allocate costs more accurately than ever before. The introduction of ABC was intended to address the problems related to the traditional quantity based costing system's shortcomings. Authors from a wide

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range of fields have asserted that ABC provides accurate pricing than traditional systems. In addition, various authors claim that precise product costs focus on providing valuable details to measure the performance, control cost, and taking strategic decisions (Kaplan & Cooper, 1998). The ABC method is required for performance evaluation. It serves as the base for performance management of all costs associated with a cost criterion in order to give a more exact scenario of the costs associated with achieving those goals. An additional benefit of ABC, according to the findings of several researches, is that it can assist businesses in expense reduction and increased profitability (Hilton, 2011).

India is one of the biggest providers of generic pharmaceuticals. The Indian pharmaceutical industry supplies more than half of the world's consumption of different vaccines, 40% of generic consumption in the US, and about 25 percent of medicine consumed in UK. Globally, the rank of India is third in aspects of pharmaceutical volume of production and fourteenth in aspects of pharmaceutical production quality. Over 3,000 people work in the pharmaceutical industry in the United States.

During fiscal tenure 2020, the Indian medical devices market had a value of US\$ 10.36 billion. From 2020 to 2025, it is projected that the market will expand at a CAGR of 37 percent, reaching US\$ 50 billion. Pharmaceutical companies and approximately 10,500 Pharmaceuticals facilities.

Further research has been conducted by several other researchers (Innes, et al., 2000)(Al-Omiri, 2011)(Abernethy, et al., 2001) to denote the aspects that impact the success of ABC implementation in a variety of western countries. Charaf & Bescos, (2013) conclude that the victory of ABC is related with behavioral and organizational aspects instead of technical factors, in contrast to (Horngren, et al., 2012), who comes to the opposite conclusion. India is Asian country whose natural environment attributes, like culture and work practices, are distinct from those of western nations, such as the US and the UK. The factors that influence adoption, non-adoption and successful execution of ABC in Indian industries are different from those that influence these factors in western countries. Up to this point, there is still no indication of how the attributes and environment of an organization influence the decision to use ABC in its business practices. Furthermore, it has not been determined what variables impact the effectiveness of ABC in Indian Pharmaceutical industry. The researcher is aware of no prior studies in this field, to the best of his or her knowledge. As a result, the current study aims to fill in the gaps and add to the existing knowledge warehouse in this area.

Study Objectives

The researcher has charted out given objectives related to ABC in pharmaceutical enterprises in Odisha:

- To investigate the factors like company characteristics and environment that impacts the adoption of the ABC system in pharmaceutical enterprises in Odisha.
- To explore factors that impacts the adoption or non-adoption of ABC by pharmaceutical enterprises in Odisha.
- To assess the advantages that the pharmaceutical enterprises in Odisha have derived from the implementing ABC.

• To investigate the hurdles that the pharmaceutical enterprises in Odisha face in the design and implementation of ABC systems.

Hypotheses of the Study

<u>The impact of the characteristics of an enterprise and business environment on adoption of</u> <u>system of ABC is discussed in detail.</u>

H1: The production complexity has significant impact on acceptance of the ABC method by the companies.

H2: The level of competition has a significant impact on the level of implementation of the ABC method by the enterprises.

Scope of the Study

As per the census of India, the total population of Odisha is 4.2 Crores and it is one of poorest states of India, despite the state's abundant natural resources. When measured in terms of the ratio of urban to rural populations, the urbanization rate in Odisha is slower than most of the other states of India; however, urbanization process in some cities is extremely rapid, with Bhubaneswar serving as an illustration. Since becoming the administrative headquarters during independence, the city has grown 17-fold in 40 years. As there was almost 17-fold increase in population (Census of India 2011).Facilities, including healthcare system, has not been established at a rate that is commensurate with this increase in population. The major reason behind this is identified as the inability of the pharmaceutical companies in the area to cope up with the demand. Some researchers also pointed out that he finance and accounting practices of these firms is highly questionable.

When compared to the previous decade, the pharmaceutical industry has contributed to the new status of India as a developing global economy, that has an average compounded growth rates of around 15.9 percent during 1994–95 and 2000–01. In 2001, the industry was worth around \$5.7 billion (IBEF, 2019). Certain areas, such as pharmaceutical drugs, were exempt from paying license and royalties under the 1970 Patent Act, allowing the industry access to the latest prescription medications at a fraction of the global market price. This growth was spurred by the exemption from license and royalties granted to certain aspects, including pharmaceuticals, under the 1970 Patent Act (IBEF, 2019). There are many different types of Pharmaceuticals facilities in India, including those of multinational corporations, large Indian corporations such as Ranbaxy, which initially focuses on generic versions, and comparatively medium Pharmaceuticals units that accommodate the local markets. It is identified in a study that many good pharmaceutical companies in India are now using latest and modern accounting techniques to become sustainable in the long run. However, it is important to establish the significance of ABC technique in these firms.

The pharmaceutical enterprises chosen for the study were chosen for a variety of reasons that have been previously documented in the literature. According to, when compared to Pharmaceuticals firms, non-Pharmaceuticals firms are a diversed group, with characteristics that are very different from one another, and whose outputs are frequently difficult to determine. The authors also pointed out that there are significant differences in cost structure between nonmanufacturers and manufacturers, as Clarke et al. (1999) demonstrated. As a result of the

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differences, it is more difficult to investigate ABC applications in different types of industries. Pharmaceuticals industries are also more probable to have greater product variety and production cycle complexity when contrasted to service and retail outlets companies, owing to the fact that they play a major role in determining how costs are allocated among different products. The management accounting many previous studies have also given careful consideration to this criterion in the course of their research. For example, Al-Omiri, (2011) conducted an Indian ABC survey in which the questionnaires were mailed to General Manager of the company, Vice President, Accountant, and Head of Finance and Accounting. A survey conducted by Bescos, et al., (2002) made use of Chief Financial Officers (CFOs). They trust that CFOs are the best people to respond to the survey because they are likely to have real and important information about the use and design of product costing systems. They assume that CFOs are the best people to respond to the survey because they have knowledge of costing.

The participants in this study were stakeholders working in pharmaceutical enterprises in Odisha. These individuals were chosen based on the assumption that they'll possess a thorough detail of practices of accounting and that they will also be key personnel in the design and implementation of ABC in their respective organizations.

Literature Review

Management and engineers placed a strong emphasis on the hiring of cost accountants to enhance the efficiency of production, which resulted in the establishment of the modern cost management trend in the industry. Rather than focusing on cost determination, the scientific cost management movement concentrated on cost control in order to improve production efficiency (Banerjee, et al., 2004). As a result, the standard system of costing was established as a reliable method of cost control, rather than the benefits and costs associated with the traditional method of costing (Chandler, 1977). The accurate calculation as well as the administration of overhead costs has been thoroughly described under one of the subject of accounting namely "Scientific Cost Control". Coordination of costs and performance was achieved through the use of timely standard costing reports that had been presented by understanding the concepts from the "Scientific Cost Control" branch of the account which were further available for modifications as per the needs (Cao, et al., 2006). The cost budgeting and accounting systems were earlier found to be used by different departments and were not integrated into a single system. For instance, the cost budgeting was majorly used by the production department while the accounting systems were handled by the financial department. As a result, the earlier structures were found more concerned about achieving efficient Pharmaceuticals as against the achievement of full financial efficiency of the company.

It is still necessary to develop a system that will aid in the calculation of accurate costs in the future despite the fact that ABC has been termed as a benefactor. To accomplish this, the following procedures must be completed: To determine the firm's resources, one must first determine all of the firm's direct and indirect operating costs, both direct and indirect. These costs will now be associated with specific activities in the future, rather than with general expenses (Ghaffari, et al., 2008). In light of this, it was suggested that the activities of a mapping firm be carried out at the same time. The activities that indirectly contribute to the production of products, such as overall leadership and managerial activities, must be included in addition to those that directly contribute to the production of products (González, et al., 2005). This is

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succeeded by tracking down the costs within the assets and activities so identified in the earlier stage for further associating the cost drivers. The identification of appropriate cost drivers is one of the most difficult problems that the Abc system has to deal with. Lastly, the cost drivers are linked with the activities identified in the earlier stage in order to undertake the estimation of costs.

The following are the conclusions reached by Drury (2000), according to another researcher: The advancement of the ABC method involves four steps:

- 1. Figure out which are the most important actions that take place within a company.
- For each activity, cost absorption is calculated and allocated to cost pools or cost centres; and
 3.
- 3. Identifying the primary cost driver for each of the major sectors; and 3.
- 4. Another method of cost assignment is to allocate the costs of each activity to the respective cost of such activities themselves.

This corresponds to the first part of the acquisition procedure, with the first two stages representing the beginning and the ending two stages representing the other phase of the acquisition procedure. In most cases, the ABC project team is in charge of putting these steps in place (Gujral. & Dongre, 2008). Various types of expertise will be required for this team, which will typically include not only management accountants but also representatives from a variety of different departments and sections within the organisation. It is possible that additional outside advisers will be brought in to assist with the implementation and design of the ABC framework.

A task that is completed with a specific goal in mind is referred to as an activity. ABC places a strong emphasis on taking action. It is therefore logical to begin by identifying the activities that will be used in the activity-based system of costing before proceeding with the design (Lin, et al., 2009). In order to identify activities, it is necessary to put together the building blocks of the ABC system. This step is critical in ABC because it significantly influences the structure and scope of the system. Additionally, this provides the accountants with a reason to dig thoroughly in the appropriate business sphere, resulting in a more accurate and efficient costing system that is based on reality rather than assumptions.

An activity could be created specifically for the purchase of materials, for instance. When a purchase order is processed, it undergoes various stages such as receipt of order, identification of appropriate supplier, purchase memos preparations and supplying the order once the order is finalized (Gujral. & Dongre, 2008). In order to identify the activities of an organisation, it is necessary to determine what has been completed with the resources that have been committed in the organization's overhead area. A systematic approach must be taken to the task at hand in order to ensure that everyone involved in performing a specific task is accurately represented or described in the final product (Innes et al., 1994).

The process is the primary focus of ABC, and process analysis aids in the improvement of product design even further. Because traditional costing founded on the drivers of volume-cost will not give clear, true, and equitable picture of resource allocation, it is necessary to develop new costing systems that are accurate and reliable. Among other things, according to Banker and

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colleagues (2002), costs of products become contorted, that lead to skewed analysis of layout for the ability to manufacture, and analysis of profitability, and pricing, among other things.

Without ABC information, it is impossible to determine the profitability of a company and to get clear scenario of the precise costs associated with every product. Besides that, Gupta and Galloway (2003) point out that when it comes to evaluating a product as a whole, evaluating specific design characteristics becomes impossible. This discussion demonstrates that ABC is beneficial in the planning of production as well as the improvement of product design.

Cost containment is more important than ever before in today's business environment, as success and profitability are more dependent on it than ever before (Udpa, 1996). The nonfinancial dimensions of quality, versatility, and time to market must be taken into account when designing today's cost management processes. ABC necessitates the identification, decomposition, and analysis of the underlying actions that are responsible for overhead costs by Pharmaceuticals and economic teams.

Based on his research, Swenson (1995) discovered around 75% of sampled companies utilise ABC for supporting their decisions of pricing, which is consistent with previous research. Innes, Mitchell, and Sinclair discovered in 2000 that the use of ABC with objective of product/service costing is highly correlated to the entire performance of ABC, and they published their findings in 2001.

The investigation's primary focus is to explore drug inventory control procedures and procedures. The purpose of the essay was to categorise medicines based on their criticism and cost, and to distinguish between the ones that need strict control on management and those that do not require such control. The pharmaceutical medications were classified using an excellent spread sheet that was based on the ABC analysis of the ingredients in the medications. It was possible to classify drugs according to their cost and criticism factors based on the results of this analysis. In order to promote effective drug inventory management with the least amount of monetary resources, to maintain the highest level of drug safety, and to reduce the frequency with which drug supplies are in short supply, the goal of these analyses is to: A successful inventory management programme can result in the provision of uncompromised care of patient at the health care facility level, if implemented properly.

The authors hope to develop a contemporary outpatient pharmacy system using the method of JIT in order to assist them in improving the operations of pharmacy. This system addresses both inventory and distribution aspects of pharmacy operations, as well as significantly lowering costs of production and increasing rates of services for their members as a result of the implementation of this system. By reducing the Bullwhip Effect, a just-in-time system for inventory management, which reduces safety stocks to enhance supply reliability, has been implemented by Titan Pharmaceuticals.

Using traditional inventory techniques as a starting point, the purpose of the researcher was to examine drug consumption products and the costs associated with drug procurement, as well as to prioritise drug procurement method. The process of determining drug stock levels has proven to be time-consuming and complicated. The abc system and the VED assessment were the methods that were used to resolve the situation at hand. For the purposes of accuracy and efficiency in drug store scientific inventories, the researchers discovered that devices are

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required for effective and precise monitoring of drug store scientific inventories. Therefore, the ABC-VED matrixes, as well as the ABC-VED matrix with the VED matrix, demonstrate that drugs require strict oversight and regulatory oversight. The ABC-VED approach must be incorporated into the medicines inventory under the supervision of hospital drug administration, as a result of this.

In order to effectively manage drug inventories, this paper is required. In order to optimise medical management, the project's goal was to decrease drug inventory costs while simultaneously increasing patient satisfaction levels. Pharmaceutical shortage, over-stock, discrimination in health-care system, unbudgeted estimation techniques, and a lack of knowledge were the most significant issues faced by companies dealing with large volumes of medicine and large quantities of inventory. The implementation of a DSS system was also approved, with the goal of assisting users in better management of drug inventories and making more dependable decisions. As a result, the patient reports higher levels of satisfaction.

In this study, the primary focus is on the selection of pharmaceutical suppliers in Sudan's central and hospital settings, which is accomplished through the application of ABC-VEN analysis techniques. Sustainable models were used to measure the inventory control system among pharmacists who worked in the centres under consideration, and the indicators were based on sustainable frameworks. According to the Centers for Disease Control and Prevention, staff members who work in drug treatment should receive extensive academic training as well as frequent master classes or trainings on the subject.

After conducting an ABC analysis on the items under consideration, the researchers discovered that 35 (52), 171 (172), and 52 (172) items were classified as A, B, and C according to their ABC classification, respectively. An overall percentage of 73 percent of the total items included in the VED assessment were deemed to be the most important, with 26 percent of all items falling into the category of essential (e).

Research Gaps

Because of the contributions of a large number of social scientists to the conceptual progression and actual implications of the concept in various industries since its introduction in the 1980s, Activity Based Costing (ABC) has made significant progress since its introduction in the 1980s. When it comes to changing dynamics of factors such as global competition, automation reformation, changes in corporate processes, and changes in the business environment, the literature has vociferously advocated for the strategic significance of ABC, which has been supported by the entire review of literature.

It was discovered through the review of the literature that there were some inconsistencies in the scope of cost management techniques that were previously undiscovered. The following are the most significant gaps in the literature that were discovered as a result of this research:

An organised compendium of the history of the costing system and development of the discipline is currently unavailable.

Because of the lack of understanding of ABC, as well as its application, it is not acceptable and is unpopular among organisations as a whole. The non-Pharmaceuticals sector has seen a

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significant increase in activity, but a review of the literature revealed that ABC is more wellestablished in the Pharmaceuticals sector.

There are various Pharmaceutical enterprises in Odisha but it is not known whether they have applied ABC or not. Therefore, it is also important to know whether Pharmaceutical enterprises in Odisha effectively applied the ABC system along with the outcomes of the application. There are various behavioral and organizational characteristics related to the success of ABC implementation. But there is no study that researched the relationship between behavioral and organizational characteristics and success of ABC implementation for Pharmaceutical enterprises in Odisha. The implementation process is not quite easy and various issues are encountered throughout the implementation of the ABC system. Again, there is no study that researched the implementation issues that the Pharmaceutical enterprise in Odisha has encountered throughout the implementation of the ABC system and how these issues can be resolved.

Research Methodology

It is necessary to undertake research with the purpose of addressing issues and increasing current knowledge in order for it to be effective (Saunders, et,al., 2009). As per Morgan and Smircich (1980), methods of research used should be selected in accordance with the study question being addressed. It is also necessary to consider if the information sought by the investigator is readily available. This is something that should be considered (Maddison, 1983). A number of criteria influence the selection of suitable techniques. One or more of the following criteria should be considered: the researcher's previous experience; the statement of research; and the target people that will be benefited from the results of this study (Creswell, 2003).

As a result of the choice of research method, there is a major impact on the requirements of the research methods that will be utilised in the examination of a topic, as well as on the research design (which includes all types, analysis, and comprehension of the data) that will be employed (Dainty, 2008).

The procedures and consequences of two classic strategies were discussed in detail in this section, as were the discussions that surrounded these approaches and their ramifications. In order to establish the path of the investigations, the positivist method (quantitative research techniques) and the phenomenology approach (qualitative research strategies) are used, respectively (Easterby-Smith, et.al., 1991). To keep things as simple as possible, the quantitative methodologies were employed in this investigation. Following the previous section's discussion of the study's aims and goals, this section discusses whether the method chosen for this study was appropriate under the circumstances.

Data Analysis

To be eligible for membership in the analysis, only those surveys had to be totally filled in all aspects. Following the collection of raw data, it was further converted into statistical information, which was then coded and entered into a data base and preservation reasons. Data files, which were prepared with Microsoft Excel, were used to store the information. In order to conduct statistical analysis, the information acquired was coded and fed in a database by utilising the statistical package for social sciences (SPSS) software programme in its version 21.

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It is possible that more tests, in addition to those given below, were employed to test the data in this research, which was done statistically. There are numerous sorts of statistics to consider when conducting descriptive statistics: I frequencies, (ii) Pearson's Chi-square, (iii) the paired sample t-test, (v) Cronbach's alpha, (vi) Pearson correlation coefficient, and (vii) factor analysis are all examples of statistical methods used in data analysis. Two different types of regression analysis exist: (viii) binary logistic regression and (ix) linear regression analysis. Binary logistic regression and linear regression analysis the following section provides a succinct synopsis of the numerous tests that were performed:

Descriptive statistics

For numerous variables, standard values are produced and presented in a large table that summarises the univariate overview of data for each of the variables. There are a variety of ways to present parameters, including alphabetical order, the order in which they appear by default, or any mix of these two methods.

The incidence and percentages of occurrences

With the Frequencies process, you may create statistical information about the variables and get a visual depiction of their analysis all on the same screen.

Pearson's Chi-squared test

For the purpose of determining if the distribution of units in a variable is based on a known or hypothesized distribution, the Chi-square goodness-of-fit method was used, and the findings are provided in Table 1. Depending on how the group has different is specified, the percent of subjects anticipated in each group of data sets can be equal or not-equal for each group of categorical data. For the purpose of determining whether or not the predicted and actual frequency bands were equal, this study compared the predicted and actual frequency bands. This is performed through the application of a statistic known as Pearson's Chi-square, which has a value of 2.

Primary Data Analysis

1. Demographic Profile

The companies that took part in the present study got selected via use of a standard randomization process. In order to respond to the survey, each firm was assigned a single member, resulting in a total of 200 responders from pharmaceutical companies in Odisha, as per results of the paper. The study was conducted in order to evaluate the multidimensionality of the ABC method among Pharmaceuticals industry sectors in Odisha, that included mainly the behaviour of different respondents in relation to factors influencing ABC adoption, the purposes for adopting / not having adopted ABC, the advantages and problems of execution, as well as the based on behavioral and organisational aspects that have impact on success of the ABC method. On the basis of the structured equipment that was utilized for the collection of the data from a sample of respondents, analysis and evaluation of the results have been carried out on the data.

Individuals who took part in the study were finance executives or executives from costing department who are important in process of taking decisions process in their respective organisations, according to the findings of the study.

Aside from that, they are in charge of the implementation of accounting management procedures in enterprises and the installation and use of the ABC method in the pharmaceutical industry.

	Frequenc	%
	У	
Gender		
М	174	93.5%
F	12	6.5%
Age (In Years)		
20-30	11	5.9%
31-40	66	35.5%
41-50	88	47.3%
51-60	21	11.3%
Education		·
Graduate	9	4.8%
UG	36	19.4%
PG	141	75.8%

TABLE1: DETAILS OF DEMOGRAPHIC INFORMA

TABLE 1.2: EXPERIENCE IN SERVICE

Experience (In years)	Frequenc	%
	У	
Less than 5 years	8	4
		3
		%
5-10	87	4
		6
		8
		%
11-20	86	4
		6
		%
More than 20	5	2
years		
		7
		%

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1.2.2 Characteristics of the organization

These are the dependent variables that are being investigated in this section: I the manufacturing industry; (ii) the type of company; (iii) the country of origin of the company; (v) the threshold of manufacturing sophistication; (vi) the concentration of competing; (vii) the tier of overhead expenses; and (viii) the accuracy of price information; It was important for each and every defendant company to complete this component of the questionnaire. Several businesses that had embraced the ABC method were contrasted to a similar lot of firms that had not embraced the system for the context of this research, and the results were quite interesting. Therefore, in order to meet the study's objective, it was important to differentiate among ABC users and other adopters in order to collect data. Based on their responses, the respondents were split into four categories, which are depicted in the table below. Among the 200 respondents to this survey, just 56 (28 percent) indicated they had accepted ABC, while 122 (61 percent) said they had never embraced or contemplated accepting ABC, and only 22 respondents (11 percent) said they were now in the process of analysing ABC for possible adoption. Take into account the fact that no corporation has ever adopted ABC and then decided to discontinue its use of the acronym.

Companies	Frequenc	%
	У	
ABC : Adopted	56	30.1%
ABC : Adopted, but later abandoned	0	0
Not adopted ABC, but taken into consideration the adoption	9	4.8%
Never considered or adopted ABC	121	65.1%
Total	186	100

TABLE1.2.3: ABC IMPLEMENTATION STATUS	S IN ORGANIZATIONS IN ODISHA
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1.2.3: Production complexity and Adoption of ABC system

When the loadings of two factors were combined, the concept "production complexity" was evaluated. The two components were "variance in the complexity among goods" and "complexity in the manufacturing processes." The methodology developed by Van Nguyen and Brooks to measure production complexity served as the foundation for this approach (1997). On a 5-point Likert scale, the participants scored the items.

Cronbach's alpha, which would be a dependability metric that quantifies the stability of variables in a construct, was used to assess the complexity of the manufacturing process. In this study, the factor 'production complexity' was found to have an alpha value of 0.875, suggesting that the measurement used has a great level of internal consistency.

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TABLE1.2.4: CRONBACH'S ALPHA FOR PRODUCTION COMPLEXITY AND ADOPTION OF ABC SYSTEM

		Mean		Std.	
Variabl				Deviatio	Cronbchí
e	Ν		T	n	s alpha
		Statisti	Std.	Statistic	
		c	Error		
Differences in the	200	3.42	.080	.899	
complexity					0.875
among products					
Complexity in the	200	3.81	.067	.932	
Processes of production					

Production Complexity Descriptive Statistics-

Everyone who participated agreed that the performance and operational ranged from moderate to somewhat higher than average. Average product complexity variation was 3.42, while the average variance in process design complexity was 3.81, according to the data.

The first cross tabulation has been conducted for determining the acceptance level of ABC system at various aspects of diversity of product. Because of the zero replies in some areas and the restricted units of answers in others, the five different sections of the average values were compressed into 3 categories by comparing the information of the numbers 1 and 2 into less and results of the digits 4 and 5 in extreme. The findings that had the value 3 showed that they belonged to the category Medium. The results are presented in the following table.

ABC Adoption Vs. Production Complexity

According to the data in the table below, 72.2% of High-growth enterprises have been nonadopters of ABC, compared to 42.7 % of Medium-growth organisations. Similarly, just 23.2 percent of High-Tech companies adopted ABC, compared to 51.4 % of Medium-Tech enterprises. Low companies were non-adopters of the ABC programme in 87.6 percent of cases.

TABLEI.2.5	TABLE1.2.5: ABC ADOPTION AND PRODUCTION COMPLEXITY						
Responses		GRO	GROU				
_		Р					
		Adopter	Non-				
		S	adopters				
	Frq.	2	13	15			
Low	%	13.3	87.6	100			
	Frq.	20	18	38			
Medium	%	51.4	42.7	100			
TT: 1	Frq.	34	99	133			
High	%	23.2	72.2	100			

TABLET A 5 A BO A DODITION AND BRODUCTION COMPLEXITY

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	Frq.	56	130	186
Total	%	30.1	69.9	100

H1: The production complexity has significant impact on acceptance of the ABC method by the enterprises

A binary (RA) regression- analysis was utilized via production complexity as predictor factors and ABC acceptance as the regression model (0 for - non adoption; 1 for adoption). The findings of (LR) logistic regression analysis are shown in table below.

Using the Chi-square test, you may quickly determine if a single predictor appropriately effects the response variable when contrasted to chance alone. In accordance with the outcome of the (LR) logistic regression model, the estimated Chi-square does not appear to be statistically significant (p>.05). In other words, the model with a deterministic model may be able to predict the dependent variable by chance (production complexity). A logistic regression model's "variation" can be quantified using the Cox and Snell R2 and the Nagelkerke R2, which are both statistics. They are interpreted in similar manner as R2 in regression analysis, but because Cox and Snell R2 also couldn't achieve maximal value of 1, interpretation becomes more difficult (Field, 2009).

High Cox and Snell scores are supposed to signal that the model is becoming increasingly wellfitting as time goes on. With an R2 value of 0.00, the logistic model is responsible for only 0.4 percent of variance in ABC increasing adoption, as per the Cox and Snell analysis. As a consequence, the Cox and Snell Value of r2 that was calculated has a decreased predictive capability. The R2 calculated by Nagelkerke is 0.006, which is extremely low. In this particular instance, it reveals that there is only a 0.6 percent relationship between manufacturing complexity and ABC adoption.

Similar to the t-test in regression analysis, the Wald statistic is test of null hypothesis, which is that the "" correlation is equivalent to zero. A p-value smaller than .05 can be used to reject out the null hypothesis, which means we can deduce that the predictor variables has a statistically significant impact on how well the dependent variable predicts.

REGRESSION (LR) FOR THE Impact on THE level OF PRODUCTION COMPLEXITY on ABC ADOPTION TARLE 1 2 6. LOCISTIC

1ADLE.1.2.0. LOGISTIC							
						95%	C.I.
	В	S.E.	Wald	Sig.	Exp(B)	for	
						EX	P(B)
						Lowe	Uppe
						r	r
	-	.185	.815	.367	.846	.589	1.216
Complexity of	.167						
Production							
Constant	-	.677	.130	.719	.783		
	.244						

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Chi-square	.815	
Sig.	.427	
$Cox \& Snell R^2$.004	
Nagelkerke R ²	.006	

It is clear from the above study that there is no statistically significant relationship among ABC adoption and output problem in pharmaceutical firms in Odisha, as shown by p value of.427 (p>.05). A result of this is that null hypothesis, which is the production difficulties does not have any significant impact on a company's acceptance of the ABC system, is found to be correct. Therefore, Hypothesis H1, which asserts that production difficulty has a massive effect on ABC system implementation, cannot be proven.

Various researches have been carried out related to determine whether the ABC approach is applicable to organisations with a higher degree of production complexity than the average (Schoute, 2011). According to the conclusions of this research, when a firm produces a diverse range of things, the ABC technique may be advantageous due to the variations in costs and procedures related. Consequently, the ABC will be profitable and advantageous for the organisation when it is implemented in its entirety (Baker, 1994). Baker (1994) emphasises that enterprises with fewer goods and a lower level of complexity do not have to adopt ABC blindly in order to make up for high direct labour costs, as previously thought. These companies must first explore with several methods of accounting before implementing the ABC technique. Companies that do not generate products with a high level of diversity, according to Baker (1994), have less need to use the ABC strategy in their operations. Gupta and Galloway had similar points of view on the subject (2003). In manufacturing, the term "sophistication" refers to a difficult or unusual manufacturing procedure, as well as a product that requires elaborate preparation and quality control (Swenson, 1995). The findings of stated study, on the other hand, imply that the intricacy of production had no massive effect on the ABC system's acceptance in firms as a whole. This finding is also uniform with the findings of Brown et al. (2004) as well as Charaf & Bescos (2013). Companies with a high level of product complexity did not necessitate the use of the ABC system.

H2: The level of competition has a significant impact on the level of implementation of the ABC method by the enterprises.

Competition and ABC adoption

Individual responders were provided a scale based on five-point Likert from 1 (none) to 5 (very intense) when asked explicitly about the level of competition in their company (extreme). In line with this approach, Swenson's method is appropriate (1995).

After doing an initial cross-tabulation, it was possible to determine how quickly the Abc approach was being adopted in proportion to the extent of competitive intensity present. The five different categories of the overall average were crumbled into 3 groups as a result of the zero and compact amount of production in some classifications. The outcomes of values 1 and 2 were joined to make a low category, and the results of values 4 and 5 were joined to make a high

category. According to the findings of this study, the number 3 was needed to demonstrate the category "Medium." Results are presented in the table at the bottom of this page.

Responses		GR	ROU	Total
-		Р		
		Adopter	Non-	
		S	adopters	
	Frequenc	7	4	11
Low	У			
	%	63.6	36.4	100
	Frequenc	11	27	38
Medium	у			
	%	28.9	71.1	100
	Frequenc	38	99	137
High	у			
	%	27.7	72.3	100
	Frequenc	56	130	186
Total	У			
	%	30.1	69.9	100

 TABLE1.2.7: COMPETITION AND ABC ADOPTION

An analysis of binary logistic regression was carried out in the study, with the competitive pressure as the predictor variables and the acceptance of ABC as the predictor variables. A single variable (strength of competition) can predict the adoption of ABC, but the modeling with a deterministic model (strength of competition) can only predict the adoption by chance, as demonstrated by results from the logistic regression model, which is statistically non-significant (p>.05). The Cox and Snell R2 and Nagelkerke R2 values of 0.001 indicate a very weak link between the level of competitiveness and the acceptance of ABC, with a coefficient of correlation of 0.001 percent. The correlation coefficient between the amount of competition and the adoption of ABC is 0.001 percent.

TABLE1.2.8: LOGISTIC REGRESSION (LR) FOR THE IMPACT OF LEVEL OF
COMPETITION ON ABC ADOPTION

	В	S.E.	Wald	Sig.	Exp(B)	95% for	C.I.
				_		EX	P(B)
						Lowe	Upper
						r	
Competition	086	.202	.182	.712	.917	.617	1.364
Constant	499	.818	.373	.541	.607		
Chi ²	.181						
Significance	.670						

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$Cox \& Snell R^2$.001	
Nagelkerke R ²	.001	

They found that, there was a lot of rivalry in Odisha, the findings of the regression analysis study demonstrated categorically that there was no major effect on ABC adoption amongst the chosen firms in the state. This predictor variable has a significance level of only.712, which indicates that it is not statically important at the current time. As a result, it can be argued that the severity of the rivalry did not had significant effect on the wide acceptance of the system of ABC. As a result, the discovery did not initially lend support to the hypothesis of H2.

Cooper (1988b) observed that "contest supply voltages the costs of mistakes since there is a higher probability that a challenger will reap the benefits of any defects created" (p. 43). As a result of rising worldwide competition and the development of revolutionary new Pharmaceutical technologies, trustworthy product cost data has become vital to achieving competitive success in the pharmaceutical industry (Cooper & Kaplan, 1988b, p. 96). Clarke and colleagues discovered that there is positive significant association of market competition and the use of managerial accounting practises (1999). The ABC method, as developed by Cooper (1988b), should be used by businesses in situations when there is significant rivalry. As a result, organisations that are faced to intense competition are more likely to accept the ABC system. According to studies undertaken by Van Nguyen and Brooks (1997), companies in highly competitive marketplaces mostly use ABC than other companies (2008).

Even still, the results of this study demonstrated that there is no relationship between the level of rivalry and the use of ABCs in the work.

Accuracy of Costing Details

The first step in the cross-tabulation technique was completed.. It is important for a company's cost analysis to be clear and correct in order to have a clear picture of how well its system is performing. It also shows whether or not the process is operating effectively or successfully, according to the corporation. For ABC or for avoiding ABC, it is vital to comprehend the concept of accuracy. While it is feasible that the companies will not implement the ABC system if they also have yet another framework in place that provides high levels of clarity and accuracy, it is more likely that the firms with lower levels of transparency and accuracy in the costing system that is already there will switch over to a more equitable plan. Companies who have used the ABC approach and are enjoying high degree of efficiency in their data are almost guaranteed to maintain to use the ABC state as long as they are successful.

The accuracy of the present system was determined by asking participants to rate it on a Likert scale based on 5-points that ranges from extremely accurate to somewhat correct to terribly inaccurate. A conventional or an ABC system may be in use at the moment, depending on the organisation. The aim of this study was to lay down the rate of accuracy of costing data among ABC users and non-users with aim of understanding the costing process. We were able to decrease the five response groups to three by combining the result of the values 1 and 2 in a section called Low Accuracy, findings of the numbers 4 and 5 into a clustering technique High Accuracy, due to the zero and minuscule proportion of responses in some groups. Specifically,

the findings of value 3 were typical of the category Medium Reliability in this instance. The results of the study are illustrated in table.

Responses of	n	GROU P		Total
Accuracy		Adopter	Non- adopters	
Low	Frq	4	51	55
	%	7.1	39.2	28.4
Medium	Frq	13	47	60
	%	23.2	36.2	34.2
High	Frq	39	32	71
	%	71.3	23.2	38.2
Total	Frq	56	130	186
	%	100	100	100
	Chi-squ P is .00	uare is 36.448, 00		

TABLE1.2.9: CHI-SQUARE TEST FOR THE ACCURACY OF INFORMATIONPROVIDED BY CURRENT SYSTEM

Generally speaking, 39 percent of the person's participants replied a high degree of correctness, followed by 34.2 % who suggested a medium rate of precision and the other 28.4 % of them who indicated a low rate of precision.

Companies -adopted ABC system

The execution of the Abc method was the focus of the inquiry conducted in this portion of the report. These sections investigate the factors that led to the implementation of ABC, what advantages were noticed as a consequence of ABC implementation, what level of success the ABC system achieved, what influence based on behavioral and institutional factors had on the achievement, and what difficulties were faced at the time of composition and construction of the system of ABC. As mentioned in the question title, this component of the survey was filled out entirely by those who worked for an organisation that was presently adopting or utilising the ABC method.

Introduction to ABC for the first time

It is obvious that the poll was only open to mangers or costing executives with minimum 5 years of experience in finance and accounting professions, and that only those with such experience were invited to participate. Consequently, it is vital to understand how people working in firms that have adopted the ABC system become acquainted with the ABC method in the first place.

TABLE1.2.10: RESPONSE ON INTRODUCTION TO ABC FOR THE FIRST TIME

Response	Frequenc	Percen			
	У	t			
University	23	42.3			
In-house training	13	18.4			
Conferences/ seminars	11	16.3			
Reading	9	15.2			
Total	56	100			
Chi-square = 12.329 ; p					
=.007					

Upon being asked how they would respond to this subject, the individual respondents presented a diverse range of solutions that were incompatible with one another. More than half (42.3 percent) of the participants mentioned that they understood about the Abc method of costing from their college as part of the learning programme, 18.4 % stated that they did learn about it from their employers as part of an in-house training course, 16.3 take a leading role that they managed to learn about the Abc method of costing by attending conferences and seminars, and 15.2 % stated that they did learn about it by reading about that in books and journals. The findings revealed that education in colleges has a substantial role in disseminating education about the Abc method, and that this role is of a relatively high importance in terms of importance. Businesses may be recommended to implement the ABC system as a result of this. Additionally, a statistically significant distinction between the 2 groups of frequencies (2 = 12.329; p=.007) was discovered through further investigation.

Implementation of ABC

They claimed to have implemented ABC, however they were at varied phases of the implementation process. Individual respondents were asked to submit responses based on their own personal experience, which is why we examined their detailed integrated of ABC in order to collect information to verify the authenticity of the answers made by the individuals who provided them. As per Clarke & Mia (1995), early investors of the system of ABC are not able to determine the effectivity of the programme during the initial phases of its implementation.

Reasons to adopt ABC system

Answering question 19 about their agreement of nine things that define the reasons for their choices to adopt the Abc in their companies, the ABC adopter have been enquired to indicating the degree of agreement with each of the items in question 19. Using a Likert scale based on 5-points that ranges from disagreement to strongly agree, respondents were enquired to describe nine different explanations. The best possible score was agree strongly, with the lowest possible scoring being strongly disagree. As a result of their findings, the causes for failure supplied in the questionnaire were divided into three major categories: inherent deficiencies of the present system, changes in the firm's attributes and corporate setting, and intervention by outside agencies. Every group comprised of 2-to-4 separate pieces of equipment.

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According to the results, the most commonly quoted reason for implementing the ABC system was the firm's inherent flaw within the existing structure (mean value = 3.56), accompanied by changes in the group's attributes and corporate scenario (mean value (MV) is 3.40), and the least commonly cited possible explanation was interference from external organisations (mean value (MV) is 2.68). According to the majority of individuals who took part in the study, the requirement for exact cost data (mean value (MV) = 4.50) and difficulty of the current system to transmit relevant details to managers (mean value (MV) = 4.13) were the primary reasons for the implementation of ABC.

Participants in the survey, on the other side, were neither in disagreement nor agreement with another point made in the questionnaire. Items from the company's qualities and work environment group, such as an increased percentage of overhead expenses (mean value = 3.64) and an increased level of competition that organisations face (mean value = 3.39), have been identified as major factors that influence the decision to adopt ABC by those who responded to the survey. The increase of the number of commercial varieties available was a third significant goal of adopting this technology in the firm's attributes and business environment group (mean value = 3.16) after it was first implemented. Only advice from auditors and consultants was reported as a key reason (mean = 3.30) for decisions made by individuals in the assistance from external organisations group; guidance from other sources was absent from the sample.

When it comes to costing, the ABC method is a good model to follow. One of the key selection areas to introduce the Abc technique in industries was the acceptance of more potential strategy that could be used in complex scenarios without requiring a change in thinking. Precise pricing is still at the core of the ABC system's fundamental notion of costing in many industrial fields, even today. As a result, the major purpose of introducing ABC practises in many businesses is to reduce overhead costs.

According to the findings of the study, larger organisations with a diverse and extensive product line, as well as more overhead, is likely to use an ABC costing system. When a larger company sells a product to a customer, it is usual for the actual cost of the product to be considerably inflated, specifically when the cost has been determined using standard pricing procedures. The ABC pricing approach, on the other hand, is not required in the case of smaller enterprises with fewer items that are less varied and complex since the amount of spending on overhead is insignificant when compared to the total amount spent on products. A complete and full explanation of the problem was supplied by Baker (1994). Companies in the present corporate environment, where challenging aspects are met on a routine basis, may opt for a more rigorous system primarily as a result of external limitations, such as the desire to stay one competitive and successful, and other factor. As Cooper (1988b) argues, one of the causes that contributed to the acceptance of ABC by firms was their desire to compete on a level playing field with their competitors. An expense accounting system is more important in businesses that are pushed by intense competition because it allows for more precision when it comes to determining the costing of the things that are manufactured. If a company has a lower financial budget, it may be more profitable to retain the present system set up rather than transitioning completely to the ABC system.

The findings suggest that the large pharmaceutical enterprises in Odisha are driven to embrace the ABC system because of a "inherent vulnerability in current systems," according to the

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findings. Also consistent with Anand et al. (2005)'s findings is the fact that the depiction of ABC in pharmaceutical enterprises in India was motivated by the fact that the present system was not useful to managers, as well as the fact that intense competition in the businesses in aspects of quality, price, and performance. Several studies, including those by Al-Omiri& Drury (2007), found that the limitations of the old costing approach were the leading cause for applying ABC, followed by the dynamic world.

Benefit	Ν	Mea	SD
S		n	
Enhanced decisions (like decisions on pricing etc.)	20	4.51	0.50
	0		4
Enhanced cost control details	200	4.51	0.60
			3
Accuracy in cost	200	4.44	0.49
			3
Enhanced product cost / data on profitability	200	4.32	0.63
			6
Assistance in efforts of cost reduction	200	4.09	0.85
			9
Increased effectiveness in budgeting	200	4.05	0.77
			3
Enhanced insights in cost causation and behaviour	200	3.91	0.66
			8
Promotion of efficiency of resource	200	3.84	1.08
			0
Enhanced waste reduction	200	3.84	0.70
			8
Provision to reliable details	200	3.79	1.10
			7
Enhancement in accessibility of	200	3.71	0.96
Details			7
Enhancement in performance	200	3.46	1.20
I I I I I I I I I I I I I I I I I I I			6
Increased competitive capability	200	3.46	1.52
			5
Customer profitability Knowledge	200	3.27	1.05
1 5 6 6		-	2
	l	l	1

TABLE1.2.11: BENEFITS FROM IMPLEMENTATION OF ABC

Success of ABC

In this section, the efficiency of the ABC plan was evaluated in greater detail. The findings of this section of the research will establish the degree to which the ABC system has been implemented successfully in Odisha's main pharmaceutical firms.

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A detailed experimental strategy was used to investigate the theory and success of ABC in order to discover the measures of success, as described in earlier parts (Shields, 1995). By examining user attitudes toward ABC deployment (question 21), and then technical features of the ABC system that is in (question 22), user satisfaction of the system (question 23), and estimated influence on organisational processes (question 24), McGowan's method compares the success of ABC implementation (question 24). (Question number 24) In fact, according to the findings of a research conducted by Fei (2010) and Byrne (2011) to examine the success assessment of ABC utilizing firms in Australia and China, McGowan's method has continued in use to this day. To this end, in order to assess the performance of the firms that were investigated in Odisha, the author has done use of McGowan's methodologies in the current analysis.

Hypotheses Verification

H1: The production complexity has significant impact on acceptance of the ABC method by the companies.

For the purpose of confirming the hypothesis, binary logistic regression analysis was carried out. The results of the regression analysis revealed that the Chi-square test was not significant (p>0.05) and that the Cox and Snell R2 and the Nagelkerke R2 were also very low, at 0.004 and 0.006, respectively. The statistical significance score of the statistical model was.367 (p>.05), indicating that it was non-significant at the 0.05 threshold. As a result, Hypothesis H1, which asserts that production complexity has a substantial impact on the acceptance of the ABC system among pharmaceutical enterprises companies in Odisha, cannot be substantiated.

H2: The level of competition has a significant impact on the level of implementation of the ABC method by the enterprises.

A binary logistic regression analysis was performed in order to test the hypothesis. The Chisquare test was found to be non-significant (p = .670; 2 = 0.181; p = .670). Binary logistic regression was used to confirm this. It was found that competition intensity was not significant in predicting the adoption of the ABC system (p=.670), and competitive pressure explained only 0.1% of described variability in adoption of the ABC system (Cox & Snell and Nagelkerke R2 =0.001), according to the results of the regression analysis. As a result, the hypothesis H2 is discarded.

Summary of Findings

There were just 56 enterprises (30.1 percent) that were found to have implemented the activitybased costing approach in their organisations. According on the results of the survey, distinct stages of the system's implementation were identified. Among other things, 13 % had approved the implementation, and another 12 percent had completed a feasibility study. A total of approximately 21% had reached the point of gaining acceptance, and the balance (54% had begun using the system in various capacities ranging from occasional to substantial utilisation.

The causes for the deployment of the ABC system were reviewed after being divided into three major groups, which were as follows: intrinsic weaknesses of the current systems, changes in the company's characteristics and business environment, and intervention from external agencies. When it comes to inherent weaknesses of the existing systems, the group ranked first with a mean value of 3.56, indicating that the most important factors driving the pharmaceutical

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industries in Orrisa to adopt ABC were the need for more correct information, inability of the present structure to provide useful data to managers, dealing with allocation problems, and improving cost control, among other things. Interestingly, these findings are congruent with the findings of Anand et al. (2005), who believe that the most significant reason for the implementation of ABC in Indian manufacturing organisations was a lack of usable information provided by the existing cost analysis to management.

The changing environment of the corporate group, which includes an increased amount of overhead expenses, an increasing number of product varieties, and more competition, was also indicated as a major reason for implementing the ABC system (mean value = 3.40) by the respondents. The mean value of 2.68 ruled out the possibility of external forces, such as government pressure and recommendations from auditors and consultants, playing any role in the adoption of ABC.

Recommendations

• It was discovered while analysing the findings of this research that many companies who had never used ABC had a high level of product diversification, production complexity and/or intensity of competition. Previous research has conclusively established that employing typical costing techniques in such a setting will almost certainly result in the reporting of erroneous product cost information. The ABC system should be implemented in these organisations because it will allow them to be more efficient in managing and decreasing overheads, which will ultimately lead to an increase in revenues.

Limitations

• The precise significance of the study cannot be determined because the current study did not validate the impact of factors at each level or as companies proceed from one phase to the next. Researchers such as Krumwiede (1998a) and Byrne (2011) claimed that the primary criteria affecting ABC performance differ at different stages of implementation.

• Because questionnaires were the primary method of collecting data, there was little interaction between both the researcher and respondents. Furthermore, there is a chance that respondents would misinterpret survey questions. The respondent's mindset at the moment of completing the questionnaire may also have an impact on the results.

• The current analysis only included industrial industries. The results of ABC success cannot be extrapolated to all sorts of industries. There is a possibility that other industries will have different perspectives on ABC success and the variables driving ABC adoption and effectiveness.

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