

Do Indian Higher Educational Institutions (HEIs) Require an ABM Framework? – A Study

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ABSTRACT

The Higher Educational Institutions (HEIs) in India are drifting through a state of financial paroxysm. This condition is chiefly attributed to the growing budgetary shrinkage in terms of fund allocation by the government together with the emergence of private players. It further adds vulnerability and threats to the existence of not only to those institutions that heavily rely on the grants received by the central or state government and funding bodies like UGC, but also to the self-financed institutions, competing intensely on price front. The existing framework for cost management in most of the universities in India is continuously challenged to ensure the appropriateness of information needed to navigate the current crises. This paper aims to design a framework for implementing Activity-Based-Management (ABM) System in University Level HEIs of India for managing performance effectively. Findings of the study identify the requirement of a robust cost control mechanism and justify the appropriateness of ABM model for HEIs in India. The study further ensures the possibility of developing an ABM framework for HEIs. Finally, a conceptual design of ABM framework for HEIs in India has been proposed. All Stake Holders of HEIs could benefit from the study advanced in the paper in that it offers a cost control mechanism in the form of ABM for managing performance effectively in HEIs of India.

Key words: Activity-Based-Management, Activity-Based-Costing, Cost Management, Higher Educational Institutions (HEIs), Resource Mobilization

INTRODUCTION

In the wake of economic liberalization, the higher education sector in India has been undergoing a radical change in its structure and funding pattern. The continuous deceleration in the public budget is the most worth noting phenomenon that has registered acute unrest to the universities, which heavily depend on the public funds for meeting their financial requirements (Chandra et al, 2008). The deceleration in the public funding of HEIs in India appears systemic and points to the forces that are guided by the neo-liberal view of development (UGC, 2008). The motive that justifies this move is the result of unanimous acceptance that the public budget cannot fund higher education, especially when sectors of mass education are starved of even bare needs (Rani, 2004). In the prevailing scenario, where HEIs in India are in a state of financial strain, the cost control should be given more emphasis than revenue generation. To overcome the current crises, the HEIs in India have no choice but to evaluate its existing cost management system. A study of Annual Reports of select universities such as Banaras Hindu University (BHU), Jawaharlal Nehru University, Delhi (JNU), Indian School of Mines, Dhanbad (ISM), Visva Bharati University, and Tata Institute of Social Sciences (TISS) reveals that costing methodologies practiced in most of the Higher Educational Institutions in India follow traditional costing methods for their expenses reporting directed towards the statutory compliance to the funding agencies and guided by the instructions of Comptroller & Auditor General (CAG), GOI. The financial reporting pattern in India is unique, lacks uniform format of presenting physical and financial data. Inconsistency in the costing pattern of HEIs in India is chiefly attributed to the complex structure, results in a complicated financing pattern,

which precisely depends upon their objective and size (Mathur & Pattanayak, 2004). Now, in the reverse situation where the cost structures of the universities are being constantly tested in the competitive market place, the universities have no comparable mechanism to detect and root out inefficiencies.

ABM is a new level of information combining financial and operational information in a way that both can be used for improved decision-making. It is a management information tool, not a financial statement valuation method. To fulfill this purpose requires that the information system take into account both the operational processes of the organization and the resources costs as represented in the financial system. These should be combined in such a way that they 1) reflect how the organizational process consumes resources and flows costs and 2) capture in total the costs in the financial system to insure the financial integrity of the model (Tarr, 2000). ABM occurs when ABC information is acted upon. Thus, ABC is mandatory at operational level, which provides necessary cost inputs to perform ABM at management level. Growing bodies of literature suggest usefulness of ABM in HEIs. In addition, the overwhelming success of ABM in the universities across the developed nations like UK, Australia, USA, New Zealand, Canada, Spain etc. supports the robustness of ABM for HEIs. Thus, it appears justifiable to develop a framework of ABM for managing performance effectively in HEIs of India. Against this backdrop, this paper attempts to develop a conceptual framework of ABM model relevant for HEIs in India. The article is divided into five sections. The first section being introductory deals with the overview of existing costing system and requirement of cost control mechanism in the form of ABM

in HEIs of India. The next section focuses on the review of related literature. The following section deals with research methodology & data source. The subsequent section discusses about the results & analysis and model development. The final section concludes the discussion.

LITERATURE REVIEW AND DEVELOPMENT OF RESEARCH HYPOTHESES

The development of hypotheses is based on the literature reviews at the different phases of requirements in the course of designing an ABM framework for HEIs in India. The related literature reviews have been summarized in table 2.1.

Table 2.1

RELATED LITERATURE REVIEWS

Explanatory Remarks	Scholarly Studies/ Reports
Requirement of cost control mechanism in HEIs of India	Punnayya Committee report, 1993; Conway, 1994; Powar, 1995; Varghese, 2000; Tilak, 2004; Mathur & Pattanayak, 2004, National Knowledge Commission, 2006; Rani, 2004; World Bank Report, 2008; 11th five years plan, GOI, 2007-12; UGC, 2008 and others have noted the importance of costs control and suggested ways & means to mobilize the existing resources to navigate the current crises.
Inefficiencies of Traditional costing methodologies	Studies by Timperley, 2002; Cooper & Kaplan, 1990; Moore, 2000; Granof et al, 2000 and others delve into the inefficiency of Traditional Costing Methodologies to deal with high support overheads and quantification of true cost of outputs.
Appropriateness and application of ABM for HEIs	Antos, 1994; Doyle, 1994; Coy et al, 1995; Westbury, 1997; Earnst & Young, 1998; Ernst & Young, 2000; Granof et al, 2000; Cox et al, 2000; JCPSG, 2000; Cropper & Cook, 2001; Cleary et al, 2001; Heskin et al, 2001; Gerdsen, 2002; Whelan, 2003; Ellis-Newman, 2003; KPMG LLP, 2003; Reich et al, 2006; Krishnan, 2006; McCherly & Rolfe, 2007; Wade et al, 2007; Valderrama et al, 2006; and others have observed the robustness of ABM and argued the appropriateness of ABM in HEIs.
Issues related to Implementation of ABM in HEIs	Cropper & Cook, 2001; Shields, 1995; Krumwiede, 1998; Fowler et al, 2000 and others have identified the contextual and organizational factors instrumental at different stages of implementation of ABM and other related issues.

Table 2.2

COSTING METHODOLOGIES IN UNIVERSITIES OF SELECT COUNTRIES

Country	Costing Methodologies in Universities
USA	NACUBO Function to Natural Classification Matrix (an approach toward Activity-Based-Costing). The functional classification is based on activities performed. Costs to the functions are allocated on the identified cost centres based on natural classification.
UK	TRAC model (a type of Activity-Based-Costing), relies on historical data from existing financial statements.
Australia	Traditional method, although the provision to classify expenses by functions reveals an approach towards ABC. However, ABC has been implemented on experimental basis for Library, university department, student costs, & other related activities.
New Zealand	Traditional method relies on historical data from existing financial statements. However, ABC has been implemented on experimental basis for Library & other related activities.
Canada	Similar to USA, relies on historical data from existing financial statements.
India	Traditional method, no costing pattern, heavily depending on the instructions of CAG.

Source: Collected and compiled from the annual reports of the various universities of the selected countries

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DEVELOPMENT OF HYPOTHESES

The extensive literature review, followed by the findings of comparative analyses of the costing pattern from the published financial statements of the educational institutions of five select (USA, UK, Canada, Australia and New Zealand) countries along with India and the responses gathered through open-ended questionnaire led to the development of the following hypotheses.

- H1:** There is a strong need for improved costs control in HEIs of India.
H2: The existing cost management system for HEIs in India is appropriate.
H3: There is a requirement of suitable costing methodology for HEIs in India.
H4: ABM model is relevant in HEIs in India.
H5: A framework of ABM model can be developed for HEIs in India.

RESEARCH METHODOLOGY & DATA SOURCE

In order to examine the hypotheses a final questionnaire was developed and pre-tested for reliability. To test the reliability, the prepared questionnaire was demonstrated to 25 respondents consisting of Accountants, Finance Officers, Auditors, & Academic professionals who have been associated with academic administration. The sample was selected by convenience sampling method. The reliability of the developed questionnaire was tested by deploying the statistical test 'Cronbach's alpha' to the responses received from 25 respondents selected randomly. The Cronbach's alpha covering the overall responses has come out to be 0.689268, which is considered a good sign of reliability of the questionnaire.

The pre-tested questionnaire was used to conduct survey from the identified survey pool. Among the government sector colleges and universities, the scope of the study is restricted to the cost management practices in 200 university level institutions. The logic for selecting this survey pool is that it covers the entire gamut of funding pattern including both public and privately owned institutions. The state universities, colleges, and autonomous bodies of state government and central government remained beyond our scope of study, as they act strictly in consonance to the requirements of the government and their financial data are not easily disclosed and most of them are unaware of the CAG (Comptroller and Auditor General) guidelines on accounting standards. Hence, their seriousness towards cost control and alacrity for a robust cost management mechanism will be relatively much consistent.

The 63 University level Institutions were selected for sample by applying random sampling (SRS) technique. An on-line questionnaire was sent through their e-mail addresses. Finally, 27 responses were turn filled, which gives a response rate of 42.8%. The details of respondents are as shown in Table 3.1.

Table 3.1

ANALYSIS OF RESPONDENTS

University Level Institutions	Numbers/ Percent
Private (Self- Financed)	17
Public funded (Government)	10
Total Respondents	27
% of Response	42.8%

RESULTS & ANALYSIS AND MODEL DEVELOPMENT

Testing of H1

H1: There is a strong need for improved costs control in higher educational institutions of India.

To test the hypothesis H1, a question was developed on a five-point Likert rating scale. The respondents were asked to display their degree of agreement/disagreement on the requirement of improved cost control in HEIs of India. The Shapiro-Wilk W Test was performed to test the normality of the data set and the value of W= 0.794, confirmed that distribution of the data set for the given variable was not normal. Table 4.1 describes the Tests of Normality. Thus, the Mann-Whitney U test was performed to test the difference between two samples.

Table- 4.1

SHAPIRO-WILK W TESTS OF NORMALITY

Need for improved Cost Control	Financing	Shapiro-Wilk		
	Self-Financed	Statistic (W)	Df	Sig.
	Government	0.794	27	010**

** This is an upper bound of the true significance.

Table- 4.2

MANN-WHITNEY TEST OUTPUT GROUP STATISTICS

Need for improved	Financing Pattern	N	Mean	Sum of	Mean	Std.	Std. Error
	Self-Financed	17	14.06	239.00	4.2353	.9034	.2191
	Government	10	13.90	139.00	4.3000	.6749	.2134
	Total	27					

Test Statistics^b

	Cost Control
Mann-Whitney U	84.000
Wilcoxon W	139.000
Z	-0.055
Asymp. Sig. (2-tailed)	0.956
Exact Sig. [2*(1-tailed Sig.)]	0.980 ^a

a Not corrected for ties.

b Grouping Variable: Financing Pattern

The p value = 0.980 > 0.05 (level of significance) for U = 84.00 in Table 4.2, signifies that the perceived gap between the two groups is not statistically significant. Thus, the Mann-Whitney U test found that the perception for the requirement of improved cost control in higher educational institutions in India remained same across the two groups. In addition, the mean values for both the categories are more than four, which correspond to 'Agreement' on the five point rating scale. Thus, it shows that there is a strong need for improved costs control mechanism in higher educational institutions of India.

Testing of H2

H2: The existing cost management system for Higher Educational Institutions in India is appropriate.

The primary objective of hypothesis H2 is to identify the lacunas that impede the appropriateness of the existing cost management system in the HEIs of India. The binary logit analysis was used to compare two important groups: existing cost management system is appropriate and those who perceive that it are not appropriate. To identify the discriminating variable(s), respondents were asked to display their degree of satisfaction/dissatisfaction on the supports that existing costing methodologies provide to accomplish the cost objectives. Here, the cost objectives are considered as discriminating variables. A five point rating scale indicating degree of satisfaction/ dissatisfaction was used to get responses.

The estimated coefficients for the independent variables are estimated using the logit value as the dependent measure. The model formulation is as follows:

$$\ln [\text{Prob}(Y=1) / (1-\text{Prob}(Y=1))] = b_0 + b_1(\text{Cost Reduction}) + b_2(\text{Incorporation of new courses/programs}) + b_3(\text{Competitive pricing}) + b_4(\text{Operating efficiency}) + b_5(\text{Resource mobilization}) + b_6(\text{Income increasing measures}) + b_7(\text{Compliance}) + b_8(\text{Fund accounting}) + b_9(\text{Budgeting}) + b_{10}(\text{Customers' satisfaction})$$

Prob (Y=1) is the probability that the existing cost management model is "Not-Appropriate."

Table- 4.3

Logistic Regression: Appropriate vs. Not-Appropriate Block 0: Beginning Block

Variables in the Equation

Step 0	Constant	B	S.E.	Wald	Df	Sig.	Exp(B)
		0.223	0.387	0.332	1	.565	1.250

VARIABLES NOT IN THE EQUATION

Step 0	Variables	Score	Df	Sig.
	Cost Reduction	2.207	1	.137
	Incorporation of new courses/ programs	0.403	1	.525
	Competitive pricing	2.039	1	.153
	Operating efficiency	7.139	1	.008
	Resource mobilization	11.716	1	.001
	Income increasing measures	0.071	1	.790
	Statutory Compliance	1.011	1	.315
	Fund accounting	0.027	1	.869
	Budgeting	4.299	1	.038
	Customers' satisfaction	0.238	1	.626
	Overall	17.616	10	.062

BLOCK 1: METHOD = FORWARD STEPWISE (LIKELIHOOD RATIO) OMNIBUS TESTS OF MODEL COEFFICIENTS

Step 1		Chi-square	Df	Sig.
	Step	14.011	1	.000
	Block	14.011	1	.000
	Model	14.011	1	.000

MODEL SUMMARY

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	23.085	0.405	0.542

HOSMER AND LEMESHOW TEST

Step	Chi-square	Df	Sig.
1	4.503	2	0.105

VARIABLES IN THE EQUATION

Step 1 ^a	Variable	B	S.E.	Wald	Df	Sig.	Exp(B)
	Resource mobilization	-1.962	.716	7.517	1	.006	.141
	Constant	6.908	2.529	7.463	1	.006	999.898

a Variable(s) entered on step 1: Resource mobilization

MODEL IF TERM REMOVED

Step 1	Variable	Model Log Likelihood	Change in -2 Log Likelihood	Df	Sig. of the Change
	Resource mobilization	-18.548	14.011	1	.000

Assessing overall Model Fit

The reduction of -2LL value by 14.011; Chi-square value of 4.503 in Homers and Lemeshow test (p value=0.105>0.5); and Cox and Snell R2, and Nagelkerke R2 values 0.405 and 0.542 respectively; explain the fitness of the predicted model.

Statistical Significance of the Coefficient

The logistic coefficient for Resource Mobilization (-1.962) and the constant (6.908) are significant at the 0.01 level based on the statistical tests of the Wald statistic. Thus, the final regression model included only Resource Mobilization as a key factor that significantly diminishes the appropriateness of the existing cost management system. The negative sign for the variable (Resource mobilization), suggesting that the higher the potency of the present cost management system to mobilize the resources effectively the lower the odds of non-appropriateness of the existing system.

Testing of H3

H3: There is a requirement of suitable costing methodology for higher educational institutions in India.

The robustness of a costing methodology depends upon the quality of the cost information it renders to accomplish the cost objectives successfully. To test the requirement of a suitable costing methodology a repeated measure Wilcoxon Signed Rank Test was used to examine the differences in the responses to the identified cost objectives. A question was developed and the respondents were asked to rank in order of their preferences for the cost objectives they would like to accomplish. A rank order scale was used to get responses. The test results in Table 4.5 reveal that the gaps in the responses are not significant when operating efficiency is compared with cost reduction and subsequently with customers' satisfaction at 5% level of significance, (p values 0.430 & 0.237 respectively are more than 0.05). Thus, HEIs in India look for a costing methodology that would support the three important cost objectives, which include overall operating efficiency, cost reduction, and customers' satisfaction in a bigger way.

Table- 4.4

DESCRIPTIVE STATISTICS

Cost Objectives	N	Minimum	Maximum	Rank
Cost reduction	27	1.00	8.00	96.00
Incorporate new courses/ programs	27	1.00	9.00	131.00
Competitive pricing	27	2.00	9.00	145.00
Operating efficiency	27	1.00	7.00	85.00
Resource mobilization	27	1.00	10.00	187.00
Income increasing measures	27	2.00	9.00	140.00
Statutory Compliance	27	3.00	8.00	159.00
Fund accounting	27	4.00	10.00	199.00
Budgeting	27	6.00	10.00	227.00
Customers' satisfaction	27	1.00	9.00	120.00
Valid N (list wise)	27			

In an attempt to investigate a suitable costing methodology for HEIs in India, the respondents were asked to exhibit their agreement/ disagreement on the identified requirements indicated in the Table 4.6. A five point rating scale was used to get responses. Mann-Whitney U test was performed to test the difference exists in the responses of the respondents pertaining to the private and government university level institutions. The basic Mann-Whitney statistic for costing methodology that are: Flexible, $U=59$ at $p=0.204 > 0.05$; Access cost of activities at detailed level, $U=51$ at $p=0.093 > 0.05$; Facilitating Resource management, $U=84$ at $p=0.980 > 0.05$; Uniform, $U=58$ at $p=0.187 > 0.05$, indicate that the gap across the categories is not significant. Thus, both the government and private funded universities equally like the necessity for a uniform costing methodology that is flexible, capable of assessing cost of activities at detailed levels and can facilitate resource management.

Table- 4.5
WILCOXON SIGNED RANKS TEST
TEST STATISTICS

	Operating efficiency- Cost reduction	Operating efficiency- Incorporate new courses	Operating efficiency - Competitive pricing	Resource mobilization- Operating efficiency	Income increasing measures - Operating efficiency	Compliance- Operating efficiency	Fund accounting- Operating efficiency	Budgeting- Operating efficiency	Customers' satisfaction- Operating efficiency
Z	-.790a	-2.160a	-2.321a	-3.319b	-3.144b	-3.388b	-4.592b	-4.416b	-1.183b
Asymp. Sig. (2-tailed)	.430	.031	.020	.001	.002	.001	.000	.000	.237

a Based on positive ranks.

b Based on negative ranks.

c Wilcoxon Signed Ranks Test

Table- 4.6
MANN-WHITNEY TEST
Ranks

Requirements	Financing pattern	N	Mean Rank	Sum of Ranks
Flexible costing methodology	Private	17	12.47	212.00
	Government	10	16.60	166.00
	Total	27		
Costing methodology that access cost of activities at detailed levels	Private	17	12.00	204.00
	Government	10	17.40	174.00
	Total	27		
Facilitating Resource management	Private	17	13.94	237.00
	Government	10	14.10	141.00
	Total	27		
Uniform	Private	17	15.59	265.00
	Government	10	11.30	113.00
	Total	27		

Test Statistics^b

	Flexible	Cost of activities at detailed level	Facilitating Resource management	Uniform
Mann-Whitney U	59.000	51.000	84.000	58.000
Wilcoxon W	212.000	204.000	237.000	113.000
Z	-1.459	-2.773	-.059	-1.483
Asymp. Sig. (2-tailed)	.145	.006	.953	.138
Exact Sig. [2*(1-tailed Sig.)]	.204a	.093a	.980a	.187a

a Not corrected for ties.

b Grouping Variable: Financing pattern

Testing of H4

H4: ABM model is relevant in Higher Educational Institutions.

The cardinal objective of this hypothesis is to explore the relevance/ aptness of ABM by segregating the key features instrumental in configuring its suitability for higher educational institutions in India. To test this hypothesis, the respondents were asked to display their opinion on the identified attributes mentioned in the Table 4.7. A five point rating scale was used to get responses on the identified attributes. The output of the 't test' from the Table 4.8, reveals that no significant gap exists between the hypothesized test value with the calculated sample statistics for the features which include Quantifies true costs; Beneficial to stakeholders; and Insight for cost causation at p values: 1, 0.161 and 0.327 respectively (calculated p values are more than 0.05).

Table- 4.7
DESCRIPTIVE STATISTICS

Attributes	N	Minimum	Maximum	Mean	S.D
Appropriate to deal with high support overheads	27	4.00	5.00	4.3333	.4804
Quantifying true cost of outputs	27	3.00	5.00	4.0000	.9608
Deal with excess capacity	27	2.00	5.00	3.6667	.8321
Beneficial to stakeholders	27	2.00	5.00	3.7778	.8006
Insight for cost causation	27	3.00	5.00	3.8889	.5774
Valid N (list wise)	27				

A significant positive gap has been observed for the feature 'dealing with high overheads' at $p=0.001 < 0.05$. In addition, a significant negative gap has been found for the feature 'Identifying idle capacity' at $p=0.47 < 0.05$. The respondents had exhibited a fair amount of agreement on the instrumentalities of all the identified features attributing relevance to ABM for HEIs in India except the potency to deal with the idle capacity.

The output of paired t-test in Table-4.9 reveals that no significant gap exists between the means of the dealing with high overheads and capacity to quantify true costs whereas gaps are significant in rest of the cases. Thus, it is inferred that the appropriateness of ABM model for HEIs in India is chiefly attributed to its potency to deal with high support overheads and quantification of true cost of outputs at any level of requirements along with other features except the identification of excess and idle capacity.

Table- 4.8
ONE-SAMPLE t- TEST

Attributes	Test Value = 4 (agreed on 5 point rating scale)					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Dealing with high support overheads	3.606	26	.001	.3333	.1433	.5234
Quantifies true costs	.000	26	1.000	.0000	-.3801	.3801
Identifying idle capacity	-2.082	26	.047	-.3333	-.6625	-.4.185
Beneficial to stakeholders	-1.442	26	.161	-.2222	-.5389	9.450
Insight for cost causation	-1.000	26	.327	-.1111	-.3395	.1173

Table- 4.9
PAIRED SAMPLES t-TEST

Attributes differences		Paired Differences				T	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
Pair 1	Dealing with high overheads - Quantifies true costs	.3333	1.0742	.2067	-9.159	.7583	1.612	26	.119
Pair 2	Dealing with high overheads - Beneficial to stakeholders	.5556	.6980	.1343	.2794	.8317	4.136	26	.000
Pair 3	Dealing with high overheads - Insight for cost causation	.4444	.6980	.1343	.1683	.7206	3.309	26	.003

Testing of H5

H5: A framework of ABM can be developed for higher educational institutions in India.

The prime objective of this hypothesis H5 is to explore the possibility of developing a framework of ABM model for higher educational institutions in India. In addition, an effort has been made to find out the factors influencing the development process. Logistic Regression/ binary logit analysis was used to test this hypothesis. The binary logit analysis was used to compare two important groups: framework of ABM cannot be developed and those who perceive that a framework of ABM can be developed. To identify the discriminating variable(s), respondents were asked to display their agreement / disagreement on a five point rating scale about their perceptions towards the factors influencing the development process of ABM.

The estimated coefficients for the independent variables are estimated using the logit value as the dependent measure. The model formulation is as follows:

$$\ln [\text{Prob}(Y=1) / (1-\text{Prob}(Y=1))] = b_0 + b_1(\text{Support from top management}) + b_2(\text{Employees commitment}) + b_3(\text{Training}) + b_4(\text{Well-communicated objectives}) + b_5(\text{Adequate resources}) + b_6(\text{Psychological costs}) + b_7(\text{Psychological barriers}) + b_8(\text{Cross-functional team}) + b_9(\text{Support from the regulatory authority}).$$

Prob (Y=1) is the probability that the ABM model can be developed.

Table- 4.10

LOGISTIC REGRESSION: ABM CAN BE DEVELOPED VS. ABM CANNOT BE DEVELOPED

BLOCK 0: BEGINNING BLOCK

VARIABLES IN THE EQUATION

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 0	Constant	.074	.385	.037	1	.847	1.077

VARIABLES NOT IN THE EQUATION

	Variables	Score	Df	Sig.
Step 0	Top management support	.365	1	.546
	Employees' commitment	4.616	1	.032
	Training	3.825	1	.050
	Well-communicated objectives	1.579	1	.209
	Adequate resources	15.406	1	.000
	Psychological costs	.083	1	.773
	Psychological barriers	12.818	1	.000
	Cross-functional team	.127	1	.721
	Support from regulatory authorities	.014	1	.905
	Overall Statistics	20.583	9	.015

Block 1: Method = Forward Stepwise (Likelihood Ratio)

OMNIBUS TESTS OF MODEL COEFFICIENTS

		Chi-square	Df	Sig.
Step 1	Step	19.982	1	.000
	Block	19.982	1	.000
	Model	19.982	1	.000
Step 2	Step	4.582	1	.032
	Block	24.565	2	.000
	Model	24.565	2	.000

MODEL SUMMARY

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	17.410	.523	.698
2	12.828	.597	.797

HOSMER AND LEMESHOW TEST

Step	Chi-square	Df	Sig.
1	.832	2	.660
2	.584	4	.965

VARIABLES IN THE EQUATION

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step1 ^a	Adequate resources	2.875	1.039	7.661	1	.006	17.719
	Constant	-11.608	4.306	7.266	1	.007	.000
Step 2 ^b	Adequate resources	2.472	1.226	4.065	1	.044	11.842
	Psychological barriers	2.049	1.209	2.872	1	.090	7.756
	Constant	-18.652	7.860	5.631	1	.018	.000

a Variable(s) entered on step 1: Adequate resources

b Variable(s) entered on step 2: Psychological barriers

MODEL IF TERM REMOVED

Variable		Model Log Likelihood	Change in -2 Log Likelihood	Df	Sig. of the Change
Step 1	Adequate resources	-18.696	19.982	1	.000
Step 2	Adequate resources	-10.674	8.521	1	.004
	Psychological barriers	-8.705	4.582	1	.032

ASSESSING OVERALL MODEL FIT

The reduction of -2LL value from 17.410 in step-1 to 12.82 in step-2 ; Chi-square value of 0.832 (p value=0.660>0.5) in Homers and Lemeshow test; improvement in the R2 values of 0.523 & 0.698 for Cox & Snell and Nagelkerke respectively in the step-2 over their corresponding values of 0.597 & 0.797 in step-1, respectively; reflect the fitness of the predicted model.

STATISTICAL SIGNIFICANCE OF THE COEFFICIENT

The logistic coefficient for adequate resources (2.472) and psychological barriers (2.049) and the constant (-18.652) are significant at the 0.1 level based on the statistical tests of the Wald statistic. Thus, the final regression model included two important variables viz. adequate resources and psychological barriers that are pivotal for the development of ABM in HEIs of India. The positive signs for both the variables, suggest that higher the degree of attention on the identified variables, the higher is the likelihood of ABM model development.

CONCEPTUAL DEVELOPMENT OF ABM MODEL

Based on the inputs received by testing the hypotheses, a conceptual development of ABM framework for HEIs in India has been undertaken. A detailed phase wise development of ABM framework for HEIs in India is described in Figure- 4.1

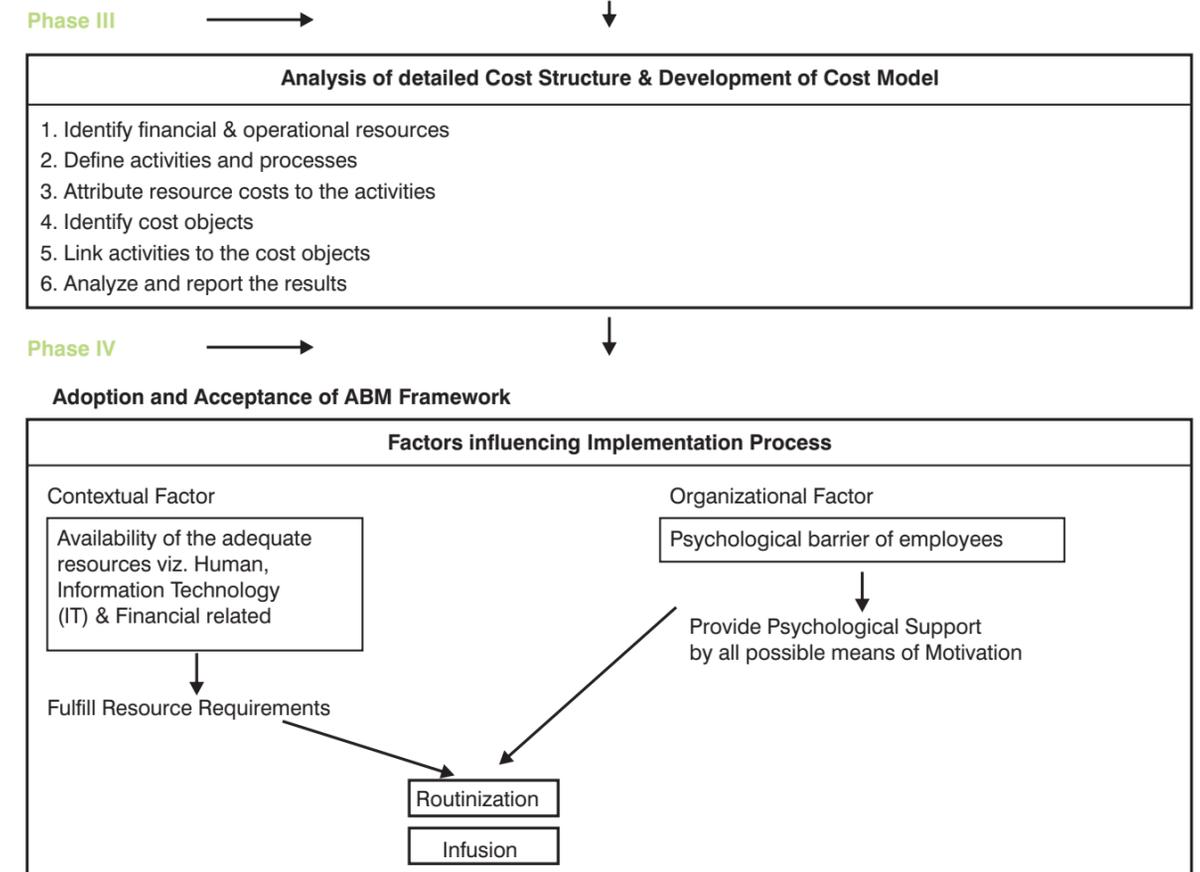
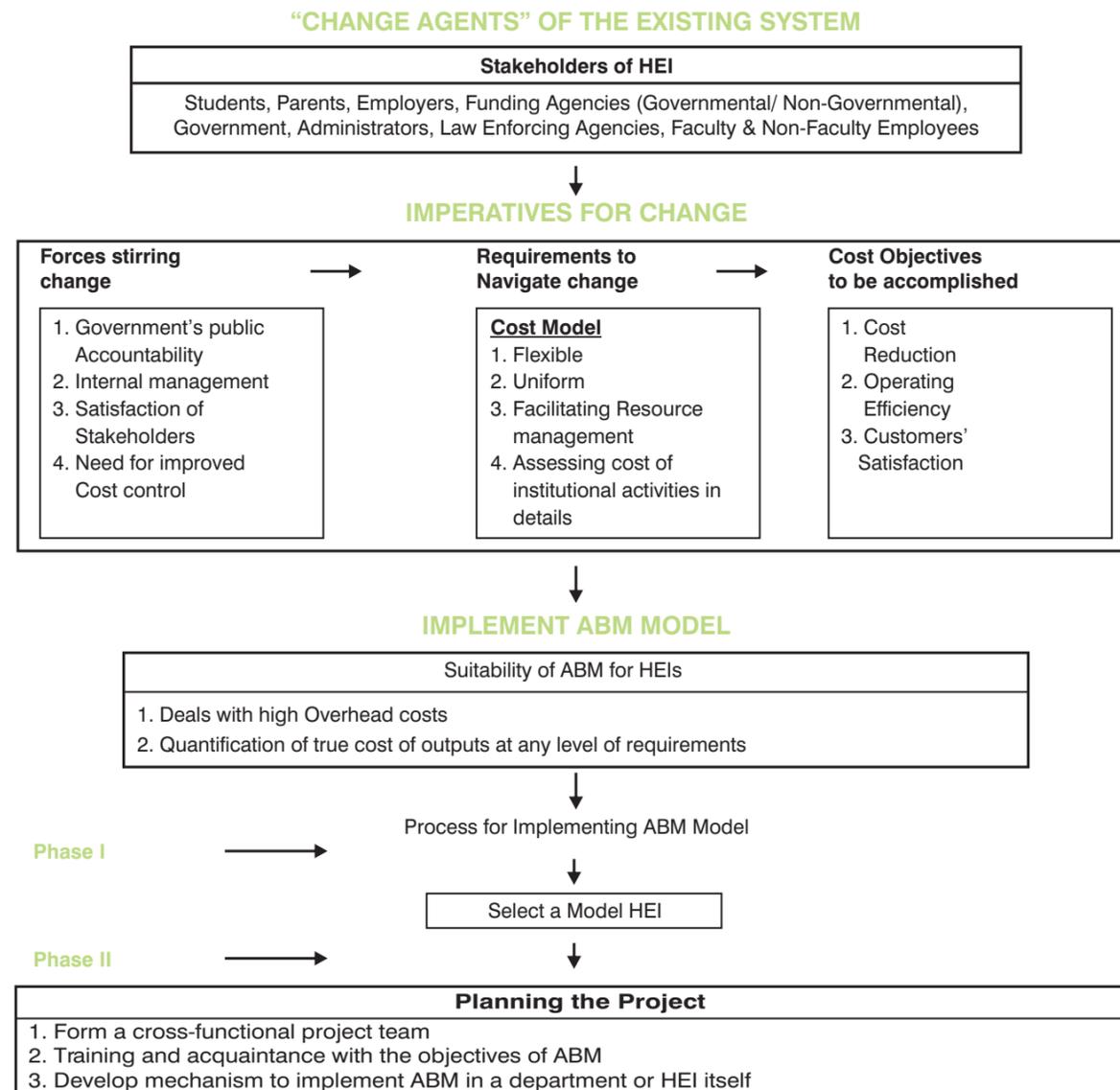


Figure-4.1: Proposed Conceptual Design of ABM Framework for HEIs in India

CONCLUSION

Considering the number of higher educational institutions increasing year after year and the growing budgetary shrinkage in terms of fund allocation to higher educations by the government over the past decade, a robust cost management mechanism is highly essential to root out inefficiencies in the system. The findings reveal that HEIs in India require a suitable cost control mechanism that can support resource mobilization effectively. An ABM model is relevant for HEIs in India in the sense that it is potent to deal with high support overheads and having ability to quantify true cost of outputs at any level of requirements. An ABM model can be developed and implemented successfully for HEIs in India if the Contextual factor - Availability of adequate resources viz. human related, IT related & financial related, and Organizational factor – Psychological barriers of employees are suitably administered.

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