

# A Study of Behavioural Variables Influencing Cost Allocation Systems

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## Abstract

*There is growing evidence that a number of factors influence cost allocation practices in organizations. This paper uses a belief-behaviour-performance research framework to find a chain of causal relations affecting the effectiveness of cost allocation systems. Four hypotheses relating to the effects of cost allocation systems is developed for this empirical study*

*A total of fifty companies consisting mainly of middle-level managers who have handled cost allocation systems formed the sample for this study. It is found that managers show an increasing interest in understanding and encouraging cost allocation in their organizations. One of the notable findings is that a strong relationship exists between attitudes and behaviour in regard to cost allocations. However, there is a need for future research in this area.*

**Keywords:** Cost Allocation, Attitude, Belief, Behaviour, Result, Efficiency, Perform, Effectiveness, Implementation, Integration.

## Introduction

In order to maximize efficiency and effectiveness of cost allocation systems, it is important to identify the causes influencing them. Intelligent cost allocation cannot be made unless the manager understands what drives them. There is growing evidence that a number of factors influence cost allocation practices in organizations.

Over the past few decades, researchers have been attempting to develop a comprehensive conceptual framework addressing the controversial nature of cost allocations. A number of studies have explored the reasons for allocating costs and the factors influencing them. Most of these studies have largely been guided by a behavioural perspective.

The wide scale convergence of global markets has highlighted the need for a renewed focus on cost allocation especially with reference to Indian companies. It has become necessary to expand and address the research relating to

cost allocation from different points of view. This approach may help in understanding and analysing the causes influencing cost allocation better.

Managers always incur costs in an organization and such costs often have to be allocated. Managers assign direct costs without using allocated costs. The allocation of cost becomes necessary when the linkage between the costs and the cost objective is indirect.

Researchers have associated certain behavioural benefits with cost allocation systems. It has often been stated that one of the likely explanation for the prevalence of cost allocation systems within an organization is motivation and control. Managers often allocate costs to influence behaviour. Some researchers have attempted to provide explanations for behavioural considerations (e.g., see Zimmerman, 1979; Ramadan, 1989; Drury and El-Shishini, 2005, Pillai, 2007).

The aim of this paper was to find a chain of casual relations affecting the effectiveness of a cost allocation system. This paper began with a review of the prior studies and theories relating to the research topic. From the literature review, four hypotheses relating to the effects of cost allocation systems were developed for the empirical study. The final objective of this paper was to present a series of conclusions which are significant for managers handling cost allocations.

## Literature Review

Researchers and management accounting scholars have often attempted to judge the effectiveness and efficiency of cost allocation systems. A basic question is what are the causes which affect the effectiveness of a cost allocation system. Researchers like Horngren (1967) have stated that a cost allocation system should help management to attain the harmony of goals (effectiveness) and the optimum acquisition and utilization of resources (efficiency).

In order to maximize efficiency and effectiveness of any cost allocation system, it becomes necessary to look at the behavioural factors associated with it. Several studies support the potential role of the behavioural implementation factors in ensuring that cost allocation systems will be efficient and effective. However, no attempt has been made to identify the factors, which can influence the effectiveness of a cost allocation system in an Indian context.

In fact, the cost allocation information currently available in the literature is almost entirely derived from the west. Information is lacking from Asian countries especially India. In this context, one of the studies examined the extent to which traditional and contemporary management accounting tools are being used in four Asian countries: Singapore, Malaysia, China and India. The evidence reviewed suggests that the use of contemporary management accounting tools

is lacking in the four countries, especially India. The use of traditional management accounting techniques remains strong (Sulaiman et al., 2004).

In spite of whatever technique is used, companies have to gain a competitive edge to survive in today's dynamic environment in which cost efficiency has become critical to success. Understanding costs and implementing good cost allocation systems is fundamental to the objective of achieving the efficiency. So, companies place great importance on the cost-benefit approach when designing and implementing their cost-allocation systems (Morse and Zimmermann, 1997).

Measuring the effectiveness of cost allocation systems is considered a difficult task and arbitrary by some researchers (Thomas, 1991), but many management accounting scholars consider it a necessary task (Drury and El-Shishini, 2005). The costs of designing and implementing a cost allocation system are highly visible. The benefits from using a well-designed system are difficult to measure and are frequently less visible.

This study will use a belief-attitude-behaviour-performance research framework that evolved from the research on social and cognitive psychology (Doll and Torkzadeh, 1991). This approach was used earlier by researchers (Weston, 2001) in regard to ERP implementation. It is for the first time that this framework is being used for implementation of cost allocation systems.

Based on the above framework, this study assumes that several pre-implementation beliefs may affect number of attitudes which in turn influences certain executing behaviour. These, in turn, impact the effectiveness of post-implementation of cost allocation system as illustrated in Figure 1.

After conducting a thorough research on effectiveness of cost allocation systems, this

study identifies five common effectiveness factors which are common and used in numerous studies (Zimmerman, 1979; Ramadan, 1985; Horngren et al., 2005). The five factors include degree of optimum utilization of resources (E1), degree of optimum utilization of capacity (E2), degree of cost reduction (E3), degree of financial contribution to the organization (E4) and degree of interaction (E5).

Very few studies have been conducted to explain the impact of a number of executing behaviours which impact the effectiveness of a cost allocation system. The literature has not explored this aspect in depth. During implementation of a cost allocation system, the overall level of cost allocation maturity (P1) and information about it (P2) are important aspects which are often overlooked by managers.

The interaction of the employees (P3) and the integration of the cost allocation system (P4) are the other executing behaviour variables which can influence the system. These variables are influenced by a very important concept called cost consciousness. Surveys (Abbas and Abd-Allah, 1999) and managerial books (Blocher et al., 2006) have considered the concept of cost consciousness to be a very important factor in cost allocation systems.

Attitude is an important concept that is often used to understand and predict people's reaction to an object or situation and how their behaviour can be influenced (Ajzen and Fishbein, 1980). In this study, attitude is used to measure how managers react to cost consciousness while allocating costs.

This influences behaviour and in this context the literature identifies four parameters to measure attitude in regard to cost consciousness. These parameters include: the attitude of the staff in allocating costs (A1), the attitude of the top management in allocating costs (A2) the attitude of the other

manager (A3) and the overall attitude towards cost consciousness (A45).

While belief represents the behavioural concepts that influence behaviour across all situations, attitudes relate only to behaviour directed towards specific situations (Kinicki and Kreitner, 2006). There is broad agreement that behavioural factors are closely associated with implementation of cost allocation systems, but the literature has not examined which of the factors are associated with the successful outcome of implementing cost allocation systems.

The organization must be thoroughly appraised and the behavioural aspects of cost allocation must be clearly understood before implementing a cost allocation system (Horngren et al., 2005). Management accounting literature suggests that companies allocate costs for a number of reasons. Researchers exploring the behavioral aspect of cost allocation systems provide support for optimal use of resources (Horngren et al., 2005). In addition, studies have examined cost consciousness and goal congruence.

However, currently there is a lack of information regarding the integration aspect of cost allocation systems. The current study examines four behavioural dimensions - optimality of resources (B1), cost consciousness (B2), goal congruence (B3) and integration (B4).

Figure 2 shows all the variables identified by the literature and to be used in this study. Altogether seventeen variables will be examined in this study. Five belong to the effectiveness category while the other have categories have four variables each.

A thorough review of the literature on cost allocation indicated that seventeen variables can be related with the belief-attitude-behaviour-result research framework. Table 1 shows a list of variables with their

corresponding reference. All the seventeen variables have been used for this study.

## Methodology

Researchers have argued that since the behavioural aspects are an important part of cost allocations, any study regarding cost allocations should also include an appraisal of the behavioural influences of the system under review (Horngren et al., 2005). This study uses a questionnaire to conduct an appraisal of the effectiveness of the cost allocation system.

## Hypothesis Generation

Drawing from the preceding literature survey and methodology, this study proposes four hypothesis:

H1. *Some effectiveness variables are influenced by certain intermediate behaviour factors.* (refer Figure 3)

H2. *Some behaviour factors are influenced by certain attitude factors.*(refer Figure 4)

H3. *Some attitude factors are impacted by certain belief factors.*(refer Figure 5)

H4. *To assume the effectiveness of post-implementation cost allocation system, a critical influence diagram consisting of a chain of belief-attitude-behaviour-result steps can be verified.*

To examine all the four hypotheses, several stepwise multiple regression analysis were conducted, the results of which are summarized in table 3, 4 and 5.

## Cost Allocation Survey

A total of fifty companies formed the sample for this study. Questionnaires were sent to managers who have been related to implementation of cost allocation systems. Before conducting the survey, a pilot study was conducted with ten companies. Based on their suggestions a few changes were made. The final questionnaire consisted of seventeen main questions with sub-parts and five general questions. The survey asked the

managers to respond on a five-point Likert scale (ranging from 1 = strongly disagreed to 5 = strongly agreed).

Figure 6 shows that most managers belonged to the middle-level category and there was adequate representation from both genders. However for the 51 & above category there were no female managers in the sample. The industry composition of the sample is as shown in Table 2.

## Analysis

To maintain readability while examining the four hypotheses, only significant regression variables and models are displayed. In this study, all +, ++ and +++ represent significant positive impact, very significant positive impact and extremely significant positive impact respectively.

## Hypothesis one (H1)

The first hypothesis examined whether some effectiveness variables are influenced by certain intermediate behaviour factors. For this purpose, five effectiveness variables and four executing behavioural variables were identified. Step-wise Regression was performed and the variables as in Table 3 were found to be significant.

Table 3 reveals that:

- P4 "Integration of the cost allocation system" extremely significantly influences E1 "degree of optimum utilization of resources"; E3 "Degree of cost reduction" and E4 "Degree of financial contribution to the organization"
- P2 "Overall level of information regarding cost allocation" extremely significantly influences E2 "degree of optimum utilization of resources".

Figure 7 illustrates a casual map based on Table 3

It displays that, among four behaviour executing variables, only two variables are

capable of directly and significantly affecting the effectiveness of the post-implementation cost allocation system. The other two variables do not affect the effectiveness of the system at all.

### Hypothesis two (H2)

The second hypothesis examined whether some behaviour factors are influenced by certain attitude factors. For this purpose, four attitude variables were identified and step-wise regression was performed between the attitude variables and the executing behaviour variables which were the independent variables for the previous case. (refer Table 4)

Table 4 clearly demonstrates that:

- A4 "Attitude towards cost consciousness" significantly influences P1 "overall level of cost allocation maturity across the organization" and P4 "Integration of the cost allocation system".
- A4 "Attitude towards cost consciousness" extremely significantly influences P2 "Overall level of information regarding cost allocation".

Figure 8 illustrates a causal map based on Table 4.

It indicates that among four attitude variables and four executing behavioural variables, only three executing behavioural variables are recognized as being influenced by the attitude variable. The noticeable finding is that out of the four attitude variables, only one attitude variable is capable of influencing and the remaining three do not influence at all.

### Hypothesis three (H3)

The third hypothesis examined whether some attitude factors are impacted by certain belief factors. For this purpose, four behavioural variables were identified and step-wise regression was performed with the four attitude variables (refer Table 5).

Table 5 clearly demonstrates that:

- B3 "Goal congruence" extremely significantly influences A1 "Attitude of the staff in allocating costs".
- B2 "Cost consciousness" extremely significantly influences A4 "Attitude towards cost consciousness".
- B2 "Cost consciousness" significantly influences A2 "Attitude of the top management in allocating costs".

Figure 9 illustrates a causal map based on Table 8.

It illustrates that only two of the behavioural variables directly and significantly influence the attitude variables. One of the important findings is that out of the four behavioural factors, only two are considered to be significant while the remaining two do not influence the attitude variables at all.

### Hypothesis four (H4)

The fourth hypothesis investigates whether a critical influence diagram consisting of a chain of belief-attitude-behaviour-result steps can be verified assuming the effectiveness of cost allocation system. For this purpose, five effectiveness variables, four executing behaviour variables, four attitude variables and four behavioural variables are examined. A chain of casual relations based on the belief-attitude-behaviour-result diagram will be displayed in the next section.

### Discussion and Implications

The first three hypothesis identified the significant variables and the other variables which did not influence any variable at all. For simplicity the figure 10 displays the significant factors through the belief-attitude-behaviour-result diagram.

Figure 10 shows a chain of casual relations affecting the effectiveness of the implemented cost allocation system. The literature on cost allocation has identified a number of behavioural dimensions and for the purpose of examining the belief variables (see Figure 1),

four important behavioural dimensions were considered.

Out of the four variables related to the behavioural concept, only two variables (B2 relating to "cost consciousness" and B3 relating to "goal congruence") are highly significant and strongly influence two attitude variables (A1 "attitude of the staff in allocating costs") and (A4 "attitude towards cost consciousness"). However, B2 also significantly influences A2 "attitude of the top management in allocating costs".

This seems to be in conformity with the literature which considers cost consciousness and goal congruence important for effective cost allocation. Further, many of the managers who took part in the survey stated that allocations influence attitude of the staff and thus promote goal congruence. In addition, studies have confirmed that a culture of cost consciousness promotes positive attitude of both the staff and the top management.

A positive attitude of cost consciousness often depends upon a number of executing performance variables. This provides the link between attitude and the executing behavioural variables which leads to the second hypothesis of this study. As explained earlier, A4 "attitude towards cost consciousness" extremely significantly influences P2 "Overall level of information regarding cost allocation" but only significantly influences P1 "Overall level of cost allocation maturity across the organization" and P4 "Integration of the cost allocation system".

To promote an attitude of cost consciousness, proper information regarding costs is necessary. The literature also states that understanding costs is a pre-requisite for implementing an efficient cost allocation system. Probably this may be the reason for A4 extremely significantly influencing P2.

The overall level of cost allocation maturity and integration of the cost allocation system are also influenced by the attitude towards cost allocation. The rationale for this reason is

probably due to the fact that many implementations have failed because of managers having no experience of handling them or not integrating the system properly.

Finally, it is found that P4 "Integration of the cost allocation system" extremely significantly influences three effectiveness variables. These are E1 (degree of optimum utilization), E3 (degree of cost reduction) and E4 (degree of financial contribution to the organization). P2, on the other hand, extremely significantly influences E2 (degree of optimum utilization of capacity).

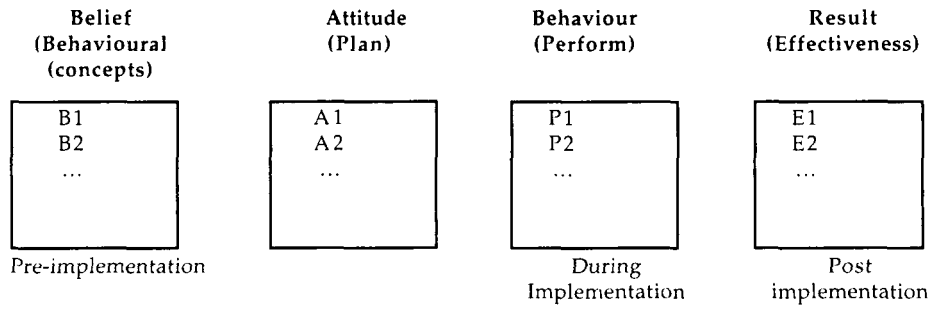
Management accounting books (Horngren et al., 2005) and surveys of company practice (Ramadan, 1989; Drury and El-Shishini, 2005) document the widespread practice of allocating costs to induce optimal use of resources and capacity. Another common reason mentioned is that allocating costs effectively helps in reducing costs. Integrating the cost allocation system effectively can lead to optimum utilization of resources. This probably explains the extreme significance between P4 and E1. Similarly, the overall level of information can lead to optimum utilization of capacity.

The integration of cost allocation systems is also closely related to the financial contribution of the organization. This includes cost-benefit analysis. If cost allocation systems are not integrated properly then the costs will be higher leading to inefficient cost allocations. This may be the reason for E2 influencing P2 very strongly.

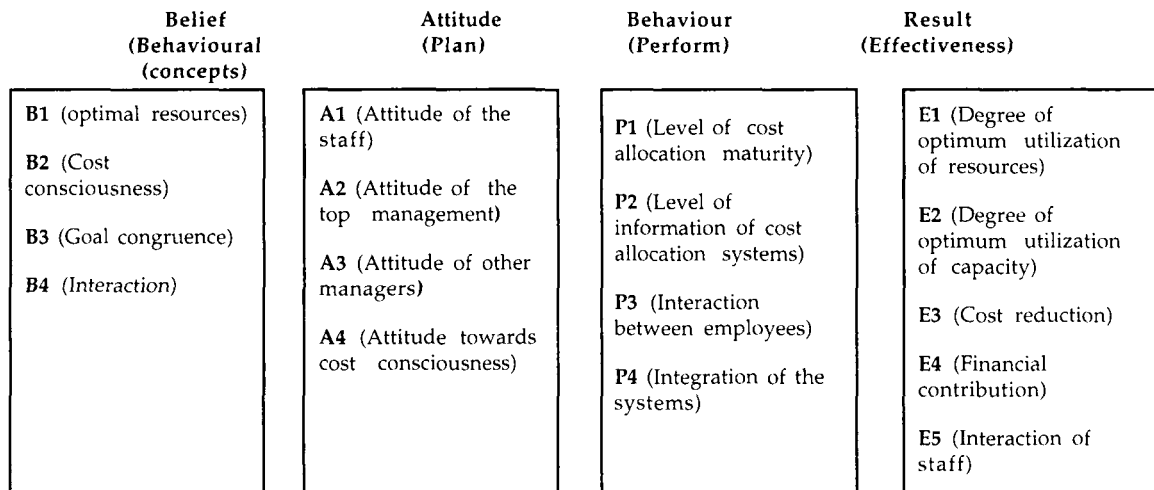
## Conclusion

This study examined the causes influencing cost allocation systems. Managers have been showing an increasing interest in understanding and encouraging cost allocation systems in their organizations. The findings of this study indicated that a number of factors influence cost allocation systems. One of the most notable findings was that a strong relationship exists between attitude and behaviour in regard to cost allocations. There is a need for further research to examine this relationship.

**Figure 1: The belief-attitude-behaviour-result research framework (Cost Allocation systems)**



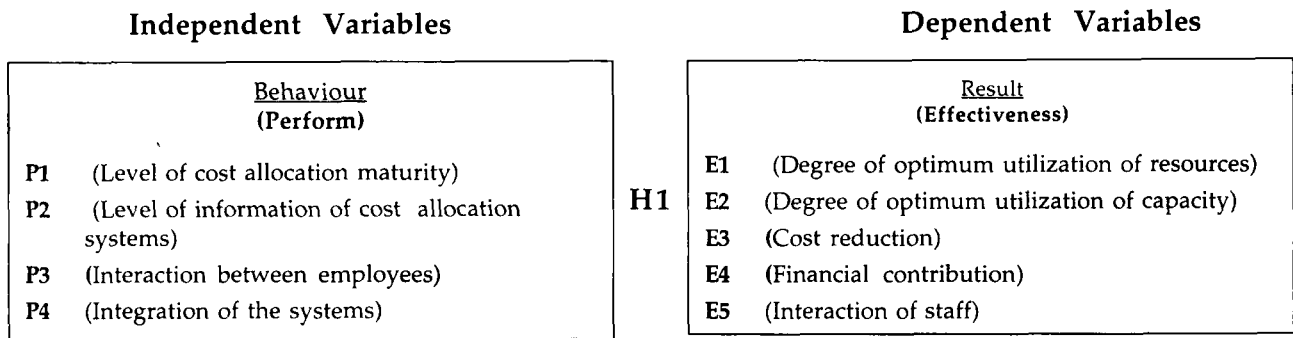
**Figure 2: The belief-attitude-behaviour-result research framework (Identification of variables after Literature Review)**



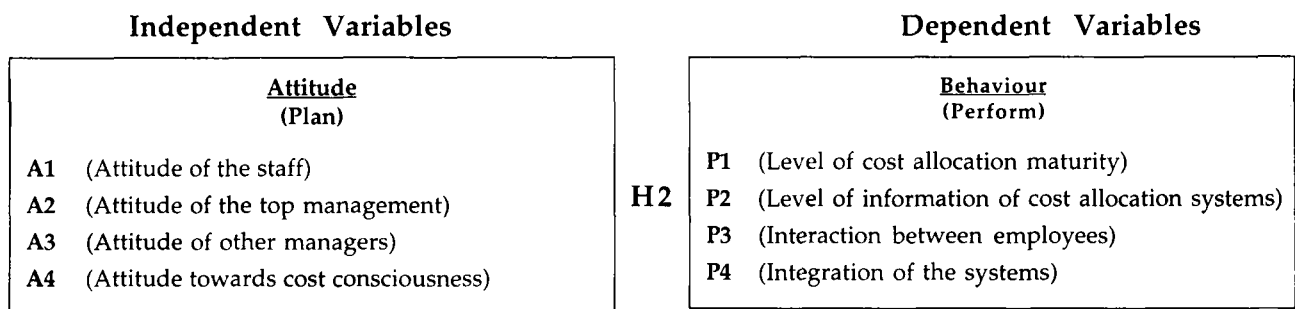
**Table 1: The meaning of each variable along with related literature**

Variable	Meaning	References
E1	Degree of optimum utilization of resources	Morse and Zimmerman, 1997
E2	Degree of optimum utilization of capacity	Balachandran and Srinidhi, 1990
E3	Degree of cost reduction	Kaplan, 1998
E4	Degree of financial contribution to the organization	Drury and El-Shishini, 2005
E5	Degree of interaction of staff	Horngren et al., 2005
P1	Overall level of cost allocation maturity across the organization	Jiambalvo, 2001
P2	Overall level of information regarding cost allocation	Fremgen and Liao 1981
P3	Interaction/cooperation between the employees	Horngren et al., 2005
P4	Integration of the cost allocation system	Jiambalvo, 2001
A1	Attitude of the staff in allocating costs	Drury and El-Shishini, 2005
A2	Attitude of the top management in allocating costs	Hansen and Mowen, 1999
A3	Attitude of other managers in allocating costs	Ramadan 1989
A4	Attitude towards cost consciousness	Abbas and Abd-Allah, 1999
B1	Optimal use of resources	Kaplan and Atkinson 1987
B2	Cost consciousness	Blocher et al., 2006
B3	Goal congruence	Sridhar and Sanders, 1993
B4	Interaction	Horngren et al., 2005

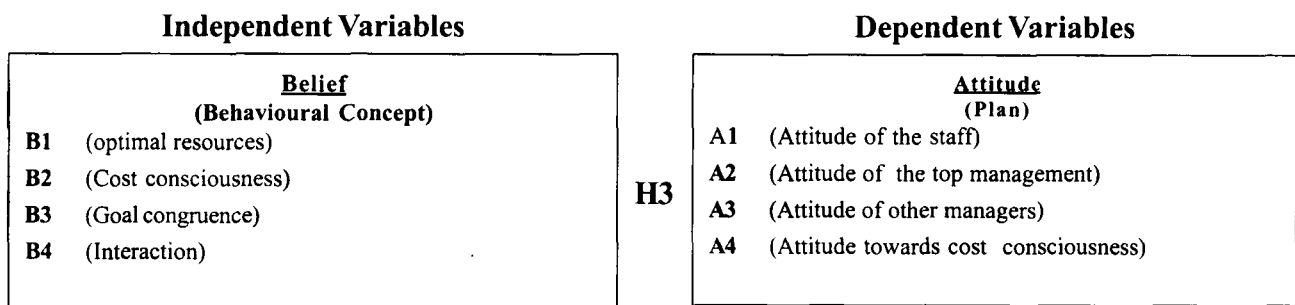
**Figure 3: Dependent and Independent Variables for H1**



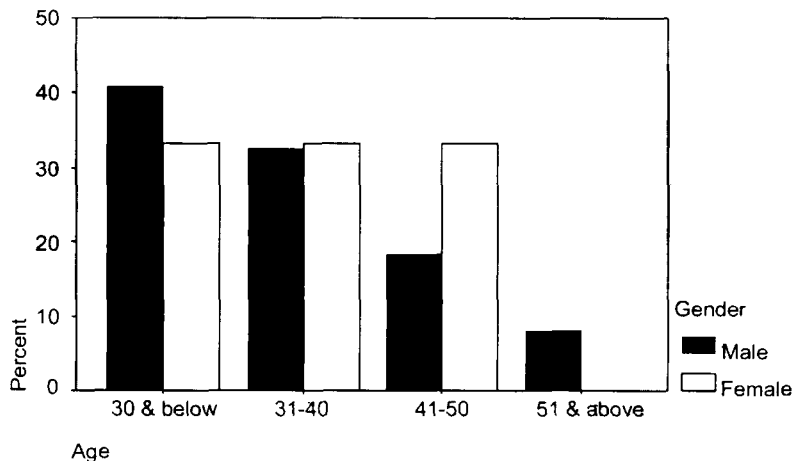
**Figure 4: Dependent and Independent Variables for H2**



**Figure 5: Dependent and Independent Variables for H3**



**Figure 6: Chart showing gender and age of respondents**





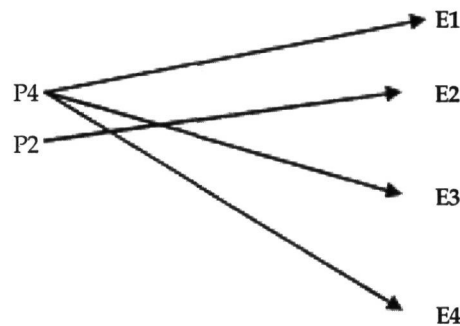
**Table 2: Industry composition**

Industry	Sample Size Proportion (%)	Sample
IT Services	12	24
Banking & insurance	11	22
Automobiles	7	14
Consumer goods	6	12
Others (Cargo, construction etc)	14	28
Total	50	100

**Table 3: Regression Analysis for H1**

Dependent Variable	Independent Variable	Standardized Coefficient	t-value	p-value	F value (p-value)	Adjusted R <sup>2</sup>
E1	P4***	0.794	7.144	0.000	51.032	0.505
E2	P2***	0.653	6.100	0.000	37.212	0.415
E3	P4***	0.794	9.247	0.000	85.506	0.624
E4	P4***	0.746	7.915	0.000	62.245	0.547

**Figure 7: A causal relation map between behaviour and result variable**



**Table 4: Regression Analysis for H2**

Dependent Variable	Independent Variable	Standardized Coefficient	t-value	p-value	F value (p-value)	Adjusted R <sup>2</sup>
P1	A4++	0.380	2.906	0.005	8.442	0.144
P2	A4+++	0.524	4.347	0.000	18.892	0.274
P4	A4++	0.359	2.720	0.009	7.401	0.129

**Figure 8: A causal relation map between attitude and executing behavioural variable**

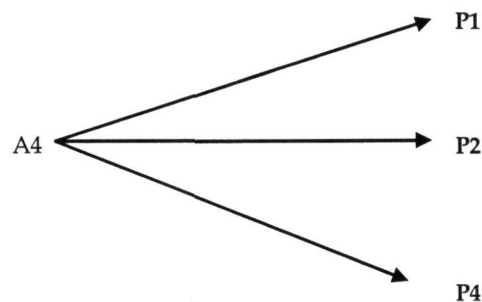


Table 5: Regression Analysis for H3

Dependent Variable	Independent Variable	Standardized Coefficient	t-value	p-value	F value (p-value)	Adjusted R <sup>2</sup>
A1	B3***	0.479	3.860	.000	14.899	.214
A2	B2*	0.298	2.204	.032	4.856	0.70
A4	B2***	0.478	3.844	.000	14.744	.213

Figure 9: A causal relation map between behaviour and result variable

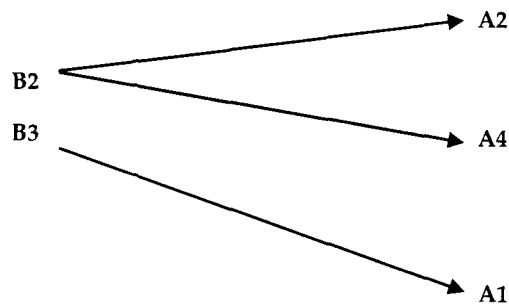
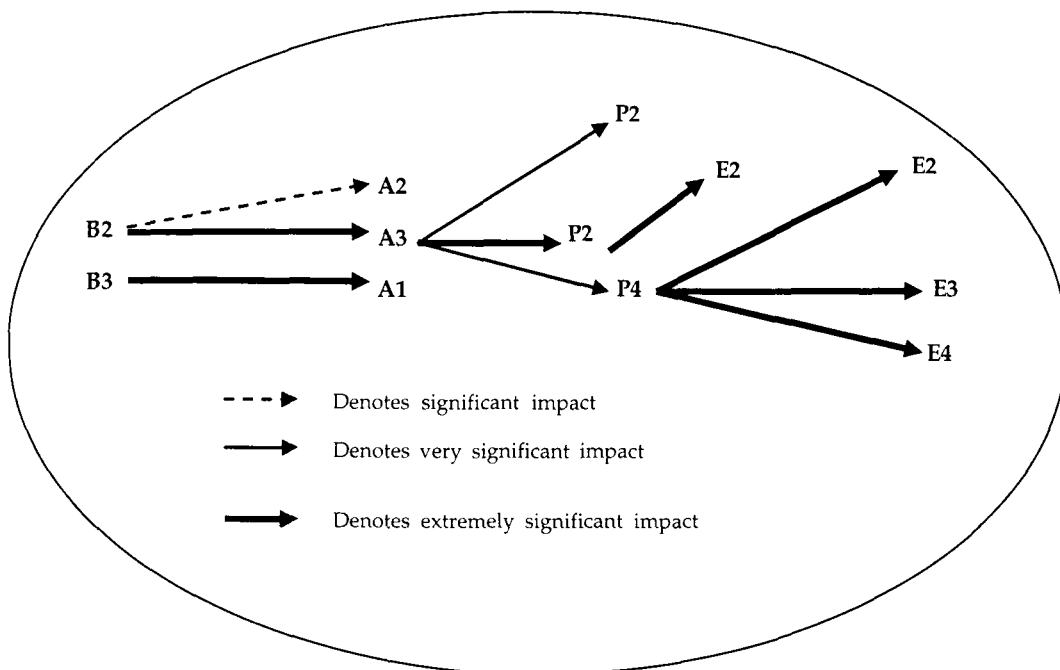


Figure 10: A simplified end-to-end causal relation map



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