

Information Systems and Business Strategy- Strategic Co- alignment: A measurement of business performance (An Empirical Study)

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Abstract— The co-alignment between business strategy and information systems (IS) along with its implications for effectiveness of IS and business performance is a crucial subject, which calls for an in-depth study. Based on an empirical study, this paper tries to substantiate the relevance of IS strategic alignment and its effect on business performance. The study also investigates business strategy, information systems strategy, and information systems strategic co-alignment, builds a construct based conceptual model to ascertain the relationship across these factors, and investigates their impact on information system performance and business performance. The conceptual model was tested under simulated environments. Analysis in the survey indicates that the strategic alignment of Information systems has a better co-relation with business performance than business strategy or information system strategy in isolation, although there could be a significant relation between business strategy and business performance.

Keywords— *business strategy; information system strategy; information system strategic alignment; information system performance; business performance, strategic co-alignment*

I. INTRODUCTION

A. Evolution of Information Technology/Systems as strategic issue – Analyzing significance:-

Computers are being used in business administration and information processing for over three decades to facilitate business and commerce. The modalities of data processing with the use of tools and techniques have changed significantly over this period of time. Information processing has overtaken the use of information technology through data processing to management information.

We cannot visualize the use of computers and information technology in isolation via-a-viz each other, as computers with networking platforms foster and promote information processing for better performance of business. This way, inter alia, computer and information technology serves as a strategic defense system in business ecosystem.

This paper examines whether strategic investments in information technology (IT) are instrumental to an organisation's long-term survival, regarded as truisms. The truth behind these truisms, however, is that IT investments matter only as far as IT capabilities become embedded in new organisational practices. Information systems (IS) strategies

therefore, need to complement high-level organisational investment goals and identify IT-enabled organisational changes necessary to realize the same.

While much attention is paid to the challenge of aligning a firm's strategic intent with investments in IT capabilities and the challenge of organisationally implementing those IT capabilities, very little is still known regarding the implementation of encompassing strategic change wherein strategic benefits from IT investments ultimately ensue. Addressing this challenge, indeed, remains a critical concern for IS strategy practice and research. To this end, we may ask as to how and why the successful organisational implementation of new IT capabilities that align with strategic intent often leads to unexpected outcomes in that they fail to produce intended strategic effects. We label this outcome strategy blindness - the organisational incapability to realise the strategic intent of implemented, available IT capabilities.

A rapid evolution and growth in the use of IS technology has created a challenging environment for IS management. Information systems are increasingly being used to generate strategic advantage for organizations. Many firms are diversifying and starting new IS-related businesses based on their strengths in IS.

B. Business/Strategic Intent and Policy-

Generally business policy is perceived to be a management activity lying on a continuum from operational, through tactical, to strategic; the differentiating factors being time horizon, breadth of impact, concreteness of the plan and the level of decision-making. These activities may be viewed as hierarchical - that is, strategy guides tactics and tactics provide boundaries and direction for operational issues. At times, there is an overlap between strategic planning and capital budgeting. The focus of value-based strategic management is on capital budgeting driving strategic management. The need for strategy flows from the inadequacy of the organisation's profit maximization goal. Strategy is a longer term aim, allowing investment in long lead-time projects.

C. Different views of IS –

The relevance of discussing the views is to understand the compatibility of the structure of IS with that of business structure.

Comparing Traditional and Alternative views of IS

1) Nature

a) Traditional Views

- Strategic IS investment from firm strategy
- Necessary investments are made
- Strategic IS is an organisational benefit

b) Alternative view

- All IS investment is strategic
- Investment enabled by labeling IS as strategic
- Strategic IS is an organisational constraint

2) Evaluation

a) Traditional Views

- Evaluation of strategic actions is complex and quantifiable
- Projects are evaluated by quantification
- Quantification dominates
- Strategy can be formulated
- Quantification is beneficial
- Strategic IS needs to be evaluated
- Evaluation used to be necessary
- Senior management dominates decision process
- IS is just another investment

b) Alternative view

- Evaluation of IS is complex but not quantifiable
- Senior management preference for qualitative information
- Organisational requirements dominate
- Strategy must be flexible
- Quantification does not lead to superior performance
- Strategic IS cannot be evaluated
- IS is moving into new areas
- Technologists dominate decision process
- IS as infrastructure

3) Use

a) Traditional Views

- IS as technology
- IS to support structured activities
- Use follows plan
- Technology follows strategy
- Organisational participants know the strategy
- Strategic benefits come only from strategic systems
- System definition/use is in the hands of the developer

b) Alternative view

- IS as a change agent
- IS to support unstructured activities
- Use conceived after implementation
- Technology drives strategy
- Organisational participants do not know the strategy
- Strategic benefits can come from transaction systems
- System definition/use is in the hands of the user

4) Returns

a) Traditional Views

- IS provides competitive advantage
- A champion is necessary
- Poor investment returns are to be avoided
- Early adoption of IS is beneficial
- Post audit should be carried out

b) Alternative view

- IS, per se, gives only temporary benefit
- A champion is a deterrent
- Poor investment returns are inevitable
- Followers gain as well as leaders
- Post audit is not needed

D. Strategy Research

Initializing the investigation for establishing alignment between IS strategy and business strategy with respect to business performance-

There are four persistent strands within IS strategy research:

- (1) Information systems strategy
- (2) Strategic information system planning to identify organisation of systems
- (3) The Information system strategy-business strategy relationship
- (4) Resulting use of specific systems, or their combinations, for competitive advantage (Business Performance).

We are focusing on the significance of alignment between business and information systems (IS) strategies, and between businesses and IS structures. In order to understand the alignment, we are studying the dynamics of changes in alignment i.e. co-alignment through strategy/structure interactions in the business and IS. We are this looking to study the changes in the strategic IS management profile (which includes business strategy, IS strategy, business structure, and IS structure) over a span of time, entailing long periods of relative stability i.e. evolutionary change, interrupted by short periods of fast and extensive i.e. revolutionary change.

E. Strategic IS Management Profile-

- 1- Business strategy
- 2- Business structure
- 3- Information system strategy
- 4- Information system structure
- 5- Business strategy performance
- 6- Information system performance

F. Theoretical patterns of alignment

Three of the four dimensions are analysed using three types:

- Business strategy -Prospector
- Analyser
- Defender
- Business structure - organic/decentralized

Theory-Based Ideal Alignment Patterns- TABLE - 1

Type of Alignment	Dimension 1	Dimension 2
Business Alignment	Business strategy Defender Analyser Prospector	Business structure Mechanistic, centralised Mechanistic, centralised semi-structured, Hybrid Organic, decentralised
Strategic Alignment	Business strategy Defender Analyser Prospector	IS Strategy Low cost Low cost, differentiation/growth/alliance/innovation Differentiation/growth/alliance/innovation
Structural Alignment	Business structure Mechanistic, Centralised Semi-structured, Hybrid Organic, Decentralised	IS structure Centralized Shared Decentralised
IS Alignment	IS structure Centralised Shared Decentralised	IS strategy Low cost, nonstrategic Low cost, differentiation/growth/ alliance/ innovation Differentiation/ growth/ alliance/ Innovation
Cross Dimensional Alignment - 1	Business structure Mechanistic, Centralised Semi-structured, Hybrid Organic, Decentralised	IS strategy Low cost, nonstrategic Low cost, differentiation/growth/ alliance /innovation Differentiation/ growth/ alliance/ Innovation
Cross Dimensional Alignment - 2	Business strategy Defender Analyser Prospector	IS structure Centralised Shared Decentralised

Based on this, we formulate the following hypotheses :

H1- Business strategy is related to business performance.

H2- Information system strategy is significantly related to information systems performance. We hypothesise that the strategic fit between business strategy and information systems strategy is directly related to business performance and information systems performance.

H3- Strategic co-alignment between business strategy and information systems strategy is significantly related to business performance.

H4- Strategic co-alignment between business strategy and information systems strategy is related to information system performance.

Finally, because previous researches have investigated the relationship between business performance and information systems effectiveness, we further extend that:

H5- Information systems performance is directly related to business performance.

II. MEASUREMENT

A. Business strategy

Business strategy can be examined using different typologies for the corporate-level strategy and the business-level strategy. We assess business strategy using the Miles and Snow's popular typology of prospectors, defenders, and analysers, which has also been used in the previous IS studies. A prospector is an organisation with an aggressive rivalry strategy that attempts to venture in the product/market development. A defender is an organisation with a traditional rivalry strategy and does not leverage new product development. An analyser, as an intermediate type, is an organisation with a moderate rivalry strategy that makes fewer and slower product alterations than a prospector and is less stable than a defender. This typology integrates elements of both corporate and business level strategies.

B. Information systems strategy

To facilitate IS strategic co-alignment computations, information system strategy was designed around the same three dimensions as business strategy. The frequencies of the strategic activities were quantified using 1=least; 2=less; 3=medium; 4=more; 5=most. Because information system strategy augments business strategy, adopting the same dimensions ensures consistency.

C. Business performance

Business performance is a complex and multi-faceted concept. We have adopted Venkatraman's two dimensions of business performance i.e. market growth and profitability. Market growth means market share gains related to competition and profitability interprets financial conditions relative to competition. Table 2 exhibits the items to assess business performance. The performance related to competition was quantified using 1=more than worse; 2 = worse; 3 = equivalent; 4 = better; 5 = more than better.

D. Information systems performance

Earlier research on information systems effectiveness has found three aspects - evaluation and prediction of profitability, evaluation of IS quality and comprehensive evaluation of IS through various indicators. In this study, we employed a tool that was composed of two key categories - user satisfaction and organisational impact. User satisfactions assess the satisfactory extent of employees and managers, and organisational impact is the measure that information system imposes on the operations of the organisation.

E. Information systems strategic alignment

Several approaches have been used to conceptualise IS strategic alignment. Previous studies have identified six perspectives of alignment: moderation, mediation, matching, co-variation, profile deviation, and systems overall approach. Moderation is the most important perspective because IS strategic alignment is an interactive factor between business strategy and information system strategy. We employ the dimensions of Miles and Snow's typology to measure information system strategic alignment and to multiply the corresponding figures of each dimension in business strategy and information system strategy.

III. DATA ANALYSIS AND RESULTS

A. Sample

The study collected data from a survey, and the respondents working with several industries with extensive management experience, this sample has a fairly uniform representation. We have forwarded 138 questionnaires and received 100% completed responses. The sample represents different types of corporations, including private limited firms (45%), public listed companies (15%), state-owned companies (20%), wholly owned firms (14%), and joint ventures enterprise (6%). The respondents included CEOs and other top managers (22%), heads in functional departments (28%), middle-layer managers (40%), and technical staff (6%), and marketing staff (4%).

Indicators of business performance and information system performance

TABLE : 2

Type of performance		Items for measurement
Business performance	Growth	Gr1: Market share gains related to competition in last 4 yrs
	Profitability	B1: Financial conditions related to competition in last 4 yrs
System performance	Satisfaction	St1: Satisfaction with IS staff and services
		St2: Satisfaction with the information product St3: Satisfaction with user participation in IS projects
	Impact	Ip1: IS improves decision-making and contributes to management effectiveness Ip2: IS contributes to the establishment of market linkages Ip3: IS increases the efficiency of business operations

B. Validity and reliability

We have used the average variance extracted (AVE) to test the validity of the model. Average variance extracted indicates how much variance of each hidden variable is captured in comparison to the metrical discrepancy. Generally, if AVE is larger than 0.10, the items of the construct are envisaged to cover most variances of hidden variables. In addition, the items in the questionnaires should pass consistency test through integrated reliability. If integrated reliability is more than 0.8, the model is satisfactory. Table 3 lists AVE and integrated reliability of all the variables. It is evident that the integrated reliability and AVE of all the variables satisfy the acceptance criteria. So we can conclude that the measurements of the model had a satisfying validity and reliability. To ensure that the constructs in the model differ from each other, we need to probe the discriminant validity by comparing loadings of all items on various variables. To satisfy this, the square root (SQR) of AVE of each variable should be more than the loadings of this variable.

Integrated reliability and AVE of model variables
TABLE : 3

	Variable	Integrated Reliability	AVE
Constructs of Business strategy	Prospector	0.875	0.704
	Defender	0.869	0.694
	Analysar	0.97	0.891
Constructs of IS strategy	Prospector	0.909	0.769
	Defender	0.949	0.856
	Analysar	0.942	0.839
Constructs of Business performance	Growth	1	1
	Profitability	1	1
Constructs of IS performance	Satisfaction	0.968	0.913
	Impact	0.977	0.953

C. Model analysis-

The study used structural equation model to investigate the theoretical model. The Chi-square value of the model is 339.83, while root mean square error of approximation (RMSEA) is 0.198, indicating a good fit.

We came to the underwritten conclusions:

1. Business strategy is negatively related to business performance ($\beta=-0.12$, $t=1.34$), but not significant. Therefore, H1 is not justified, which indicates that business strategy has no direct influence on business performance.
2. Information system strategy is considerably positively related to IS performance ($\beta=0.48$, $t=5.37$). H2 is justified, which exhibits the importance of IS strategy for business performance.
3. Information systems strategic co-alignment considerably influences business performance ($\beta=0.33$, $t=4.21$) and IS performance ($\beta=0.28$, $t=3.29$). H3 and H4 are justified, which substantiate the significance of IS strategic co-alignment for business performance. IS strategic alignment is more manifestly related with business performance than with business strategy. Information processing in firms cannot only

depend on the information systems itself. The combinations with business strategy could support success in IS construction and bring benefits to the organisation.

4. IS performance does not considerably influence business performance ($\beta=0.19$, $t=1.21$). H5 is not justified, which suggests that not all information systems improvements could contribute to business performance.

IV. CONCLUSIONS

The model in this investigation has practical effects for the IS landscape in various organisations. Planning of business strategy and information strategy is the first step for attaining “co-alignment” with latent variables, while it is more important to implement planned strategies. The theoretical model exhibits that IS strategic alignment modifies business performance. Thus, the co-alignment of business strategy and IS strategy could result in better business performance. The model also shows the relationship between business strategies and IS performance. There is no significantly cause-effect relationship between IS strategy and business performance in the conclusions. Thus, investment in information systems does not ensure high return and profits for the organisation. An organisation’s evaluation of information technology should not concentrate only on the systems perspective, but integration with business strategy is more fruitful.

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