# A FRAMEWORK FOR EFFECTIVE IT INVESTMENT
## From the Perspective of Business – IT Alignment and Organization

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Abstract:     Although studies on the investment effect of information technology (IT) have been proceeding, the requirements for effective IT investment are changing due to changes in the conditions and circumstances of many companies, such as diversified organization types (*e.g.* types of relationship between IT section and business planning section), and consideration of effectiveness of enterprise groups at the international level etc. In this situation, a methodology for reinforcing the IT investment effectiveness of diversified companies individually (not simply a standardized methodology) might be significant. In order to take up this challenge, the authors propose a framework for effective IT investment from the perspective of business - IT alignment and organization.

## 1 INTRODUCTION

Research into effective IT investment has been proceeding for years, in line with business requirements. As for the effectiveness of IT investment and the effectiveness of BPR using IT, there are works such as analyses of the relationship between macro economic data on IT investment and financial data, or evaluation methods of IT investment. These works have contributed to determining the importance of IT and provides evaluation methods of IT investment effects. There are works about the cost effectiveness of IT from the perspective of IT project management. These studies offer project management know-how and methodologies for improving the effectiveness of IT. Recently, there have been studies analysing the relationship between leadership and the activities of the chief information officer (CIO) and IT effectiveness. These studies contribute to showing the effective actions of CIO. From the point of view of researchers and consultants, the authors have been pursuing studies on these themes, such as the methodology of business-process modelling, the relationship between business and IT, and IT effectiveness (including satisfaction). However, the authors feel that a need for new methodologies for improving IT effectiveness has arisen because the business environment has changed. For example, there are now more diversified organization types (*e.g.* with a relationship between the IT section and the business planning section), and consideration of the effectiveness of enterprise groups at the international level is important. Thus, traditional uniform methodologies do not always work in these situations. Under these conditions, the authors propose a new framework for improving IT effectiveness from the perspective of business-IT alignment and organization. This framework will suggest ways for effective IT use and effective business process re-engineering (BPR) considering the situation that companies currently face.

## 2 RELATED WORKS

Works related to the business effects of using IT or IT implementation can be classified into certain groups: analysis of success factors of IT implementation, analysis of success factors of IT management, and return on investment of IT. Based on the BPR theory presented by Hammer and
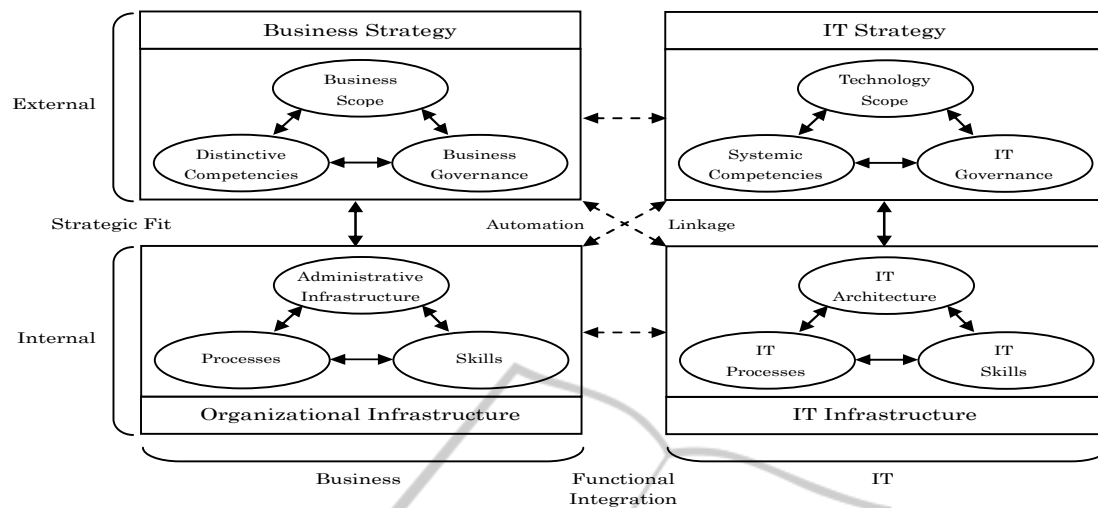
Figure 1: Strategic Alignment Model (Henderson and Venkatraman, 1993).

Champy, researchers have conducted studies from various perspectives (Hammer and Champy 1993). Grover et al. focused on the implementation problem (1995), Earl et al. analyzed the relationship between BPR and strategic planning (1995), and Attaran explored the relationship between IT and BPR in regard to capabilities and barriers to effective implementation (2004). Taguchi, Iizuka et al. analyzed the success factors of IT management, especially for ERP systems (2007). Kadono and Tsubaki focused on the mechanism of how IT creates business value, particularly from the viewpoint of IT management (2006). Chikara and Takahashi attempted to adapt the customer satisfaction method to the information system as part of the information system audit measurement (1997). However, these works do not thoroughly focus on the relationship of organizations or the differences in the satisfaction structure of organizational sections. Moreover, there are additional issues that have come to light recently, *e.g.*, the balance of efficiency and internal control (including information security management), and organization reform or enterprise integration, including the causes of recent economic circumstances. In order to address these issues, the authors have endeavoured to conduct research to clarify the mechanism for achieving BPR effectiveness.

As for business-IT alignment research, Henderson and Venkatraman proposed the realization of business-IT alignment by balancing four areas (1989): business strategy, IT strategy, organization platform, and IT platform, using the strategic alignment model (SAM). External and internal factors of both business and IT strategy must fit (have "strategic fit"), and functions of

business and IT must be integrated in order to balance the four areas (Figure 1). Sabherwal et al. improved the strategic formation system management profile model, which is similar to SAM (2001). Tangible type was defined for each of the four areas (business strategy, information system strategy, business structure, information system structure). These studies are significant in that they focus on IT effectiveness from the management viewpoint as well as the technical viewpoint. However, the success factor of IT implementation differs according to the circumstances or profile of each company (*e.g.* organization structure types, management type, etc). Therefore, IT management frameworks that consider the types of companies will be more effective. The authors propose frameworks for effective IT implementation by ensuring consistent alignment of business and IT considering the situations and constraint conditions of companies, and categorizing those conditions. This framework focuses on both the method of ensuring consistent alignment and the project management of BPR.

## 3 BITA-BPR MODEL

### 3.1 Requirement for Effective IT Investment Model

Considering the situations and problems that companies are currently facing, as mentioned in the previous chapters, there is a need for effective IT investment. A possible new framework could have the following features:
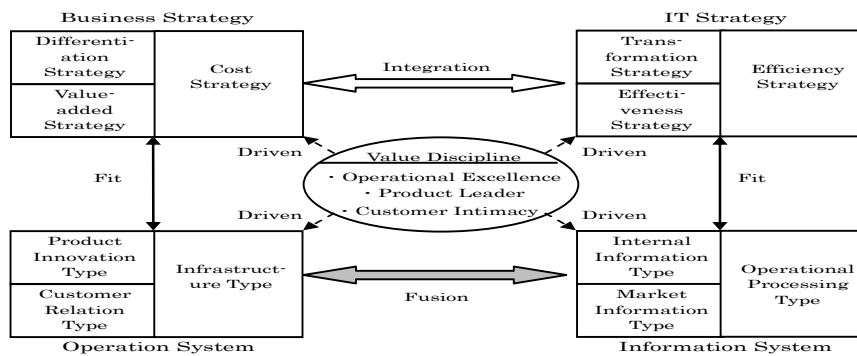
Figure 2: Business – IT Alignment (BITA) Model.

- Possibility of working out the relationship between degree of "business - IT alignment" and "IT effectiveness".
- Possibility of working out how to improve IT effectiveness in the most effective way, considering the situations and circumstances of the companies.
  - ➢ *e.g.* Organization types (relationship between business planning section and IT section, IT service subsidiary company types).
  - ➢ Not guiding in only one particular direction, but showing alternatives for improving in ways that fit to each situations precedent and constraint conditions.
- Consideration of effective IT investment at a global level.
  - ➢ This is because globalization of companies is progressing and many companies are considering effective IT investment and its use at global levels.
  - ➢ Considering global IT implementation, cultural factors are important. There has been research on cultural differences in using IT in some categories, *e.g.* groupware (Suadamara et al. 2010).

In order to meet these requirements, the authors propose a new framework, the BITA-BPR model. This framework is based on two models formally designed by the authors: the Business- IT alignment (BITA) model (Kudo and Yasuda 2010) and a two-dimensional alignment enterprise modeling framework named as the Collaborative Enterprise Model (CEM) (Iizuka and Matsumoto 1999). These models are described in the following sections.

## 3.2 BITA Model

Business-IT alignment (BITA) model is a value discipline-driven strategic alignment model (Kudo and Yasuda 2010). The value discipline concept suggested by Treacy and Wiersema (1995) is built into this framework. The value discipline pursued by a company determines the alignment between business and IT. "Strategic" alignment means the goal of alignment is to gain a competitive advantage. "Business process superiority," "product superiority" and "customer intimacy" are defined as "value disciplines" of this model (Figure 2). "Business process superiority" is extracted and modified for a new framework proposed in this paper.

## 3.3 CEM

Collaborative Enterprise Model (CEM) is designed for ensuring consistent alignment of business and information systems, "model (including platform)" and "instance (business and IT operation of real world" (Figure 3). This model is a two-dimensional, alignment enterprise model. In the scheme of this model:

- From the definition of CEM (Iizuka and Matsumoto 1999), 'Enterprise business (in the real world) would be reflected by "model", because enterprise (in the real world) is a "instance" of model', we can evaluate enterprise (in the real world) by evaluating the enterprise "model", which is a meta level of enterprise.
- From the definition of CEM, 'Enterprise "model" would be reflected by "meta model", because the enterprise model is an instance of the meta model', we can evaluate the enterprise "model" by evaluating the "meta model (reference model, etc.)". One of the most important and characteristic aspects of the framework which can be seen in this paper is that it uses two dimensions: "instantiation" and "resolutions". As was described in Figure 1, the
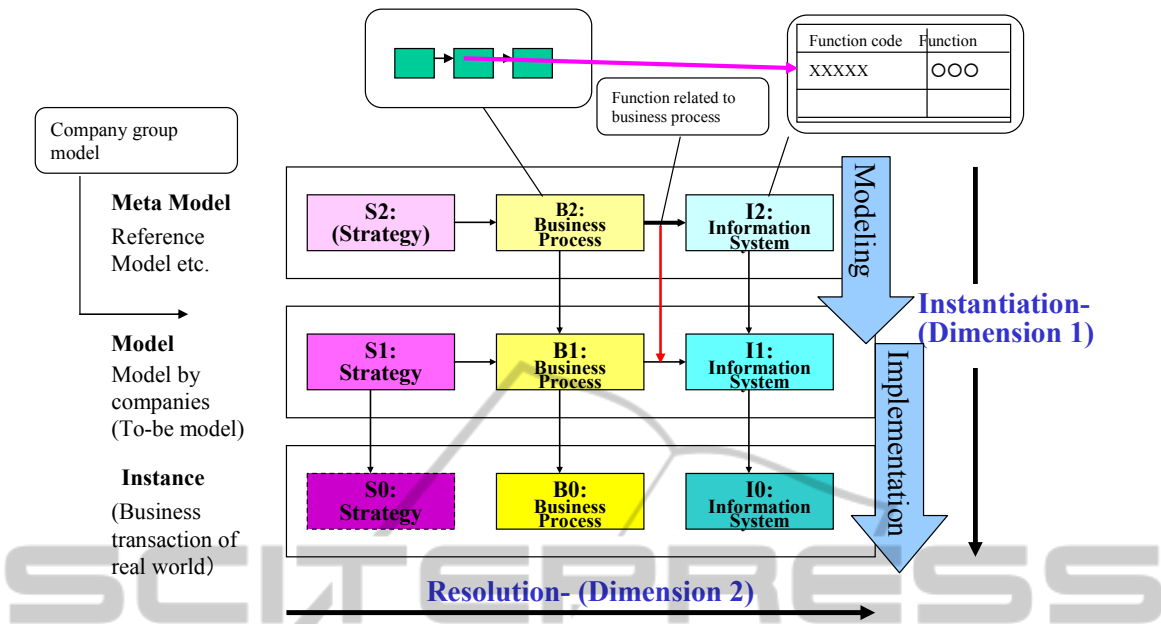
Figure 3: Two-Dimensional Alignment Enterprise Modelling -Collaborative Enterprise Model (CEM ).

"meta model", "model", and "instance" are
defined, and the relationship of the "model" to
"instance" and from the "meta model" to
"model" is called instantiation. The "meta
model" is a kind of reference model, but there
are templates for business process, objects for
an information system that is categorized by
keys (industry etc.). "Model" is an enterprise -
specific model. "Instance" is the real world of
enterprise. "Strategy", "business process",
"information system" within the same level of
either "meta model", "model", and "instance",
exist. In addition, in this paper, their
relationships are defined as resolution.

## 3.4 BITA-BPR Model

The BITA-BPR model is a framework intended to:

- Realize an effective business and information
  system, by taking alignment of business and IT,
  and improving the effect of IT investment.
- Realize an effective business re-engineering
  (BPR) process by showing effective ways of
  considering the specific situations or
  circumstances of each company.

The BITA-BPR model is a model that is based on
business superiority disciplines extracted from the
BITA model, with the addition of CEM dimensions
of re-engineering tasks. Also, the authors add a
method that offers various alternatives that consider
situations and constraint conditions. In order to
confirm the availability of these alternative elements,
the authors are conducting surveys. Some of the
survey results are described in the next chapter.

## 4 FROM PRE-SURVEY RESULTS

### 4.1 Organization Structure and BPR Task

Research on the BPR effectiveness of the IT
implementation or operation includes: analysis of
success factors of IT implementation, those of IT
management, and return on investment of IT.
Therefore, the authors analyzed the difference in
effectiveness caused by these organization type
differences.

Relationships between the IT and business planning
sections of companies have diversified over the last
few years. This change can be considered as arising
from a change in the role of IT: from just a tool of
for saving man-hours to the tool that supports the
strategy of management. Concretely, the IT section
that is an independent organization is enumerated so
far and it is enumerated that enterprises with a strong
connection to the BP section and the organization
have appeared. Under this change, the difference can
be seen in the effects of business reform by the
difference in the relationship between the IT section
and the business planning section. Figure 4 shows
the result of the analysis of the relationship between
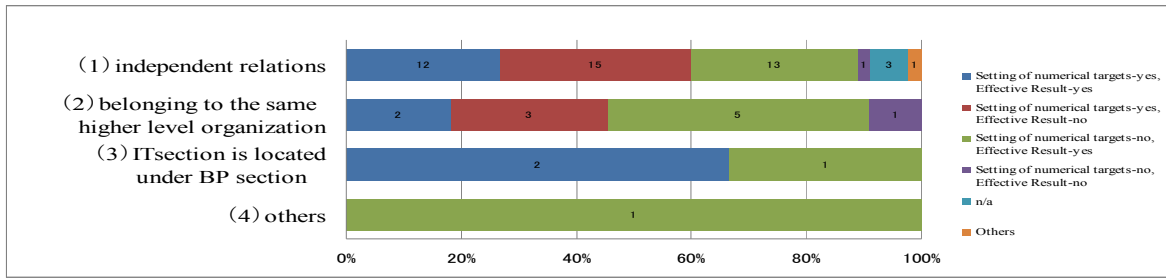setting metrics ("Setting numerical target of BPR?")

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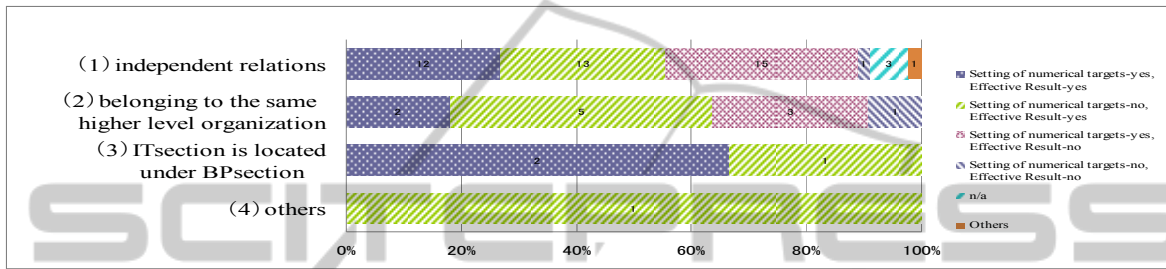Figure 4: BPR Effectiveness by Organization Type (SEC-BPR).



Figure 5: BPR Effectiveness by Organization Type (SEC-BPR)[Sort order changed].

and BPR effects ("Had effective BPR result?"). These questions were only asked of firms that answered "BPR status is now implemented". By organization pattern (1) IT section and BP section have an independent relationship, (2) the IT section and BP section belong to the same higher level organization, and (3) the IT section is located under the BP section. The ratio of the firms that answered "Setting of numerical targets-yes" was high for the groups of firms that answered that the IT section and BP section had an independent relationship (Figure 4). However, the ratio of the firms that answered "effective result-yes" was high for the firms that answered that the IT section and BP section belonged to the same organization (Figure 5), and in this organization pattern, "setting of numerical targets-no, effective result-yes" was much more prevalent than other organization patterns. The reason for this fact is that the organization infrastructure compensates by setting specific numerical targets. In other words, setting numerical targets may enable compensation of an organization of communication infrastructure in some way. As communication infrastructure, a balanced scorecard (BSC) is also effective. The firms that answered "BSC implemented" have a greater tendency to achieve BPR effectiveness than firms that answered "BSC not implemented". Other findings from the pre-survey results are (from statistical analysis):

- The relationship between the business planning section and IT section affect BPR.

- Even if the business planning section and the IT section are not close in the organizational structure of the company, it is possible to improve the BPR effect by setting numerical targets.
- The inter-organization communication level affects BPR effects.
- The degree of commitment of top management of BPR is related to the setting of numerical targets.
- The degree of commitment of top management of BPR is related to the setting of numerical targets.
- Even if numerical targets are set, it is difficult make effective without the commitment of top management.

## 5 CONCLUSIONS AND FUTURE RESEARCH

The goal of this paper is to present (i) a new framework for effective IT investment, and (ii) the first version of a model to assess business-IT alignment in the Collaborative Enterprise Model (CEM); this is called the BITA-BPR model. Based on an analysis of the potential applicability of several theories and models in the area of business-IT alignment, we present a new model, the BITA-BPR model, which is based on business superiority

disciplines extracted from the BITA model combined with CEM dimensions of re-engineering tasks. Then the authors have added methods that offer alternatives according to situations and constraint conditions for BPR. This framework will suggest the effective use of IT, as well as the most effective BPR implementation process, considering the situation that companies currently face. To achieve this purpose, the survey that the authors are planning will cover the organizational sections of IT, business planning, and end-users. Businesses will get more value from IT by considering their operational and strategic business needs. There are several approaches that can be taken to align IT with business. Some approaches focus on the roles of individual IT contributors, while others focus on the needs of the business side and their position in the market. The authors will conduct a survey to clarify if by using BITA-BPR, the IT department can deliver the right support to various business divisions to meet their strategic goals. The analysis results from this research will contribute to effective BPR by showing feasible options for companies.

## ACKNOWLEDGEMENTS

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