Using Balance Score Card in aligning strategy implementation according to information technology development in organization

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Abstract. Organizations can use methods of strategies implementation control such as Balance Score Card while designing their strategies based on their current infrastructures (as internal resources). One of the most important supportive infrastructures in all organization is IT. In this article, by using information technology levels identify organization information system's attributes according to its maturity level. In each maturity level, we need alignment between strategies in IT and other infrastructure's strategies. During strategy implementation, Balance Score Card dimensions can be weighted differently based on organization strategies and objectives regarding its development level.

In this paper, by using BSC in IT department, information technology development levels model and its related questionnaires, we will identify which dimension of BSC have priority in align strategy implementation control according IT development level of organization. In future, according IT level and each level characteristic, we can design optimal BSC dimension balance for align strategy implementation, and then, predict necessary efforts to develop through levels and grow to higher level.

Keywords: IT system development level, IT BSC, BSC, Alignment

1. Introduction (Use "Header 1" Style)

Modern organizations need Information Technology Services to pursue their business goals. Any kinds of organization use IT in a special way according to its range of activities, known as IT maturity. IT maturity is a direct result of implementing business strategies. One of the most important tools for implementing and controlling strategy harmonically, is Balanced Score Card and pioneer companies monitor the alignment of their activities by this methodology. The main problem addressed in this paper is "What kind of strategic goals should be pursued by organizations according to their Information Technology maturity?" and "What are proper criteria to evaluate the proper choice of goals?

2. Concept of IT BSC

Kaplan and Norton introduce BSC to monitoring implementation and performance measurement according to organization's strategies. BSC is based on four well known perspectives, Financial, Customer, Process and Learning and Growth. Van Grembergen has developed an IT BSC in 1998, (Kaplan & Norton, 2005). Creating strategic maps and designing BSCs for supporting functions such as IT, let organizations to align their internal processes by customers and learning and growth goals by business goals. Because of that, supporting units such as IT change from expense centers to strategic partners (collaborators). The process of

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designing BSC happens in all business units one by one and at the end, by integrating these cards, a comprehensive BSC at organization level will emerge (Kaplan RS and Norton DP, 1992 Jan/Feb, pp71-79). Most of the times, IT units support competitive advantages by focusing on business unit level strategies such as cost leadership, production management and customer lock in.

In financial perspective, cost reduction and increasing outcome goals happened by presenting productive IT productions and services. IT unit's strategies can be aligned with organization's strategies by using Strategic IT Services Portfolio. This portfolio is the result of discussions between business executives and IT managers.

In customer perspective, degree of success in presenting IT services can be measured in two levels:

1. The basic competency level: presenting IT services in proper quality, high degree of reliability, and proper price,
2. The value-adding contribution level: amount of help by IT unit to business units for more productivity and added value and in the end, changing to a Critical Success Factor in succeeding strategies in all business units.

In process perspective, there are three strategic concepts:

1. Pursuing operational excellence (refers to business unit capability to present services in competitive price, proper quality and high degree of reliability),
2. Development and supporting to partnership between business units (contains development of proper solution according each business unit needs. In this way, IT unit is presumed as strategic partner for other business units and playing important role in implementing strategies),
3. Preparing strategic support for business units (IT unit by presenting new and Information-based solutions, supports from business unit's different kind of strategies) (Kaplan RS and Norton DP, 1992 Jan/Feb, pp90-95).

Personnel's goals in learning and growth perspective, clarify fundamental needed skills for IT unit's personnel. These skills are aligning with operational excellence goals, business partnerships and solution to be first mover in industry. IT unit also creates new customer oriented culture in organization. In this culture, experts identify business unit's strategies and operations and for supporting them, suggest mixed of solutions, services and productions that will result in external customer and internal unit's satisfaction.

3. IT/IS Maturity Levels in organization

John Ward (2002) analyzed trends of Information Systems and Information Technologies development with a strategic approach. He clarified the goals of IT/IS in three levels as:

- Data Processing (DP): to improve operational efficiency by automating information-based process
- Management information systems (MIS): to increase management effectiveness by satisfying their information requirement for decision making,
- Strategic information systems (SIS): to improve competitiveness by changing the nature or conduct of business

The "Data Processing" approach is problem/task/process focused to ensure that automation through IS/IT of those task achieves the required efficiency improvements and thus benefits – the required return on investment (Ward, 2002). In this level, we need to consider whole IS development process (in perfect situation) not just as a program to process specific data and information. Stephen Haag (2004) suggests 6 level of overall organization goals, according to organization IT strategies and goals. These goals can be mapped into the to Ward's three maturity levels model as shown in second column of table1.

Table1- summarized IT Systems Models Development

Maturity Level	Total System Goals	System Critical Character
DP	• Increase employee productivity • (Increase system efficiency)	• computers • fragmented • Hardware limitation • remote from users controlled by DP • Technical issues(programming/ project management)

		• reducing costs (esp. administrative) • technology driven • regimented operational (internal)
MIS	• Enhance decision making • Improve team collaboration	• distributed process • interconnected • software limitation • regulated by management services • support business user needs (information management) • supporting the business (manager) • user driven • accommodating / control
SIS	• Create business partnership and alliance • Enable global reach • Facilities organizational transformation	• networks • integrated • people/ vision limitation • available and supportive to users • Relate to business strategy? • enabling the business (business driven) • Flexible/ strategic? (external)

(Sources: 1. adapted from R.D. Galliers, 'from data processing to strategic information systems: A historical perspective', 2. Stephen Haag, 'management information systems for the information age'

4. Expanding Model

We can summarize researches in ITBSC and IT maturity levels in Table1and 2. In table1, we combine two models. First, we conform "Total System Goals" (Haag, 2004) with Ward's three maturity levels model (first column). Second, we adapt "System Critical Character" (R.D. Galliers, 1987) in third column with maturity levels and each level goal. According to this table, we can have a conclusion such as "in each level, what kind of goal should be pursued, and what are that system critical characters". In the table 2, we summarize ITBSC model and redefine "Total Goals" based on IT BSC perspectives.

Table 2- Summarized ITBSC model

IT BSC perspectives	Total Goals
Financial	• IT units cost reduction and increasing their outcome
Customer	• presenting IT Services in proper quality, high degree of reliability, and proper price • amount of help by IT unit to business units for more productivity and added value
Internal Process	• pursuing operational excellence • development and supporting the partnership between business units • preparing strategic support for business units
Learning and growth	• improve fundamental needed skills for IT units personnel • creates new customer oriented culture

After reviewing IT-BSC model and the generic goals for maturity levels of IT systems in organization, we can assume an assignment matrix to identify what kind of goals are more probable to be pursued in each maturity level of IT system, so that improve the state of alignment in an organization.

5. Research Methodology

More research we have designed a questionnaire that rated each aspect of the IT BSC based on the level of information system development organization shall specify. The questionnaire filled out by IT experts, and finally the response analysis; the matrix was obtained which shows each level of system development in IT, which focuses on strategic goals and appropriate BSC model for increasing the level of IT system development what goals will be further considered. In completing this questionnaire is assumed that all attributes are equally important objectives.

We have chosen about 30 experts to fill the questionnaires. All the elected experts are educated in IT management and technology management in grate universities of Tehran. Half of these persons are professors and others are doctorate students in this field. They filled the forms during 1 to 2 weeks and then bring us back. As a result of this analysis we will have two key findings: 1.Overall rating score of each level of IT system development in the realization of each of the four general goals of IT BSC, 2.Characteristics

affect each system in achieving the goals. Also, after analysis and removing answers with low scores, goals and characteristics that are chosen for each level of systems maturity by experts, were determined as Table 3.

Table 3: The most important characteristics of effective goals and levels of development

Develop level	Goals	Important characteristics
DP	• **Internal Process** - Identification of new technology functions - Maintaining safe and reliable infrastructure - Improving productivity and profitability of business units - Optimization of IT processes • **customer** - Basic services with competitive prices - Reduced IT costs	• Technical issues(programming/ project management) • regimented operational (internal) • remote from users controlled by DP • reducing costs (esp. administrative)
MIS	• **growth** - Attract, develop and maintain key personnel • **Internal processes** - Development of effective decision-making support systems - Quality Management Services • **financial** - Reduced IT costs - Ensure budgeting	• support business user needs (information management) • supporting the business (manager) • regulated by management services • distributed process • interconnected • accommodating / control
SIS	• **financial** - effect on output organization - Reduced IT costs - Ensure budgeting growth - Develop customer-oriented business • **Internal processes** - Partnership with customers and identify their strategies • **customer** - Needs of business units with analysis based on IT - Provide high quality services	• enabling the business (business driven) • Flexible/ strategic? (external) • Relate to business strategy

6. Conclusion and results

To have an efficient and effective organization, objectives and functions of all departments and units should be aligned with organization strategy. In this study, using the IT developed systems model, functions and characteristics of IT systems in any organization has been discussed in detail and to control that how functions are in harmony with the strategies of the organization, IT BSC model was used. Therefore, with composing models and the use of expert opinions in management information systems and analysis of the comments, the following key findings were obtained:

1. The most important aspect in lower developed levels is internal processes and with increasing maturity and development of information systems, financial objectives, and growth and learning become more important.
2. In more developed systems, more balance among the four IT BSC goals is visible. In less developed systems, organizations can not focus on all four aspects equally and usually one of the four perspectives will be more important.
3. In terms of the features and effective characteristics of each level, by movement to more developed levels of maturity, importance of technical factors reduces and network systems and support functions will have more impact on the decision-making and reaching strategic goals.

7. Suggestion for further research

We hope that this research can be an introduction for future studies in the following topics:

4. Comparative studies in organizations with different maturity levels of IT/IS
5. Policies for different kinds of organizations to achieve the IT BSC goals and trying to balance the four perspectives and thus promote the information system to higher levels of maturity.

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