A Weighted Average Scale for Multi Stakeholder Evaluations of Enterprise System Success

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1. ABSTRACT

An Enterprise System (ES), unlike a traditional Information System (IS), entails many stakeholders ranging from top executives to data entry operators. These stakeholders typically have multiple and often conflicting objectives and priorities and rarely agree on a set of common aims. The importance of gathering perceptions of IS-success at multiple levels in organizations has been discussed among academics for several decades. However, there is no universal agreement on what stakeholders should be canvassed and how to interpret results. This research attempts to design a weighted average scale to better interpret findings when gathering data from multiple stakeholders.

2. INTRODUCTION

Enterprise Systems entail multiple stakeholders. The importance of gathering perceptions of System success at multiple stakeholders within an organization has been discussed among academics for several decades (e.g. Cameron and Whetten 1983; Leidner and Elam 1994; Tallon, Kraemer et al. 2000; Sedera 2004). Contemporary IS-success (ES is an archetype of contemporary IS) studies have used various stakeholders making it difficult to generalize the findings and impossible to make comparisons. Moreover, there is no universal agreement on (i) what stakeholders should be canvassed, (ii) whether all stakeholders are adequately informed about every dimension of the system and (iii) whether differential weightage is required to interpret the results of success assessments.

Previous studies have treated multiple stakeholders and the data collected from them, without any distinction. Every stakeholder group would have a different perception of ES success but by grouping their responses together we are ignoring the difference in their perception.

In an attempt to minimize perplexity and to increase our understanding of interpreting multiple stakeholder responses when assessing ES-Success, this research attempts to develop a differential weighting scale. Such a weighted average scale is valuable for contemporary IS research to understand: (1) the views of multiple stakeholders, (2) the influences of the lifecycle phases when interpreting responses, and (3) whether certain stakeholders are better informed on certain success dimensions. The following section outlines the aforementioned objectives.

1. **Multi-Stakeholders:** An ES, unlike a traditional Information System, entails many 'users' ranging from top executives to data entry operators. These stakeholders typically have multiple and often conflicting objectives and priorities and rarely agree on a set of common aims (e.g. Cameron and Whetten 1983; Quinn and Rohrbaugh 1983; Yoon 1995). There is no Universal agreement on what stakeholders should be canvassed in an ES-Success study. Many IS success studies seek only a top-management perspective (Shang and Seddon 2000; Shang and Seddon 2002), yet research suggests that ES often succeed or fail at the operational level. In order to gain a 360-degree view of the ES, it is important to analyze ES-Success at all levels of the organization; from multiple perspectives. The proposed differential weighting method and instrument is designed explicitly for this purpose. Sedera et al (2006) demonstrated the evolution of employment cohorts in IS-success studies over the past decade by demonstrating a decline on data collection of *Operational* staff and a strong incline in *Strategic* and *Management* Staffs. Their study empirically identified four internal stakeholders of ES (i) Strategic, (ii) Management, (iii) Operational and (iv) Technical.
2. **ES-Lifecycle phases:** Ross and Vitale's (REFERENCE) ES lifecycle model identified a dip in organizational performance [ES-Success] post- 'Go Live', thereafter followed by steady improvement. Such a normative model and related ES-Success scores can aid organizations to better manage expectations of new ES, and to better plan mid- and longer-term for evolution of the ES. In example, it may be appropriate to place relatively greater emphasis on the Quality dimensions (Information & System) early in the lifecycle (during and soon after the 'dip' it is too soon for 'Impacts' to have been realized), and relatively greater emphasis on the 'Impact' dimensions (Individual & Organizational) later in the lifecycle. The different stakeholders place emphasis on different dimensions during the ES lifecycle phases. For example, during the implementation phase the managers may place emphasis on data accuracy and this could shift to a greater emphasis on system quality or process re engineering in the post implementation phase. Therefore there is need for these dimensions to be measured differently.
3. **The foci on multiple stakeholders:** Using the multiple stakeholders – Strategic, Management, Operational and Technical – researchers (Sedera et al., 2004; Sedera et al., 2006) have demonstrated that certain stakeholders tend to be better informed about, and more influenced by a particular ES-Success dimension(s). Not surprisingly, these employment cohorts place relatively greater emphasis on those dimensions that they are better informed about. For example, Strategic employment cohorts may place a greater emphasis on Organizational-Impact compared to Technical respondents' emphasis on System-Quality.

3. STUDY APPROACH

The stakeholder classification is developed based on the three kinds of knowledge that is required for an ES implementation (Davenport, 1998), the knowledge matrix (Sedera et al., 2003) and the four stakeholders (Sedera et al., 2006). Respondents' knowledge is assessed on the knowledge of the (i) system, (ii) business processes and (iii) the organization. The intended weighted average model would include the three aspects, in combination with traditional "job title" to determine the *degree of proficiency*, which extends over a continuum, from novice → intermediate → expert (Ericsson and Charness, 1994). The a-priori model will be tested using survey data.

This differential weighting scale would generate scores that provides in-depth information on the stakeholders (For example, Final Score = {Raw Score *[Factor of experience]*[Factor of Lifecycle Phase]}). Employing a differential weighting approach, organizations might place relatively greater emphasis on a particular stakeholder based on their proximity to a particular success dimension. Sensitivity analysis can yield the best overall measure of ES-Success. Analysis of survey data using the ES-Success approach, would seek to gauge how sensitive results are to variation in weightings across the dimensions, and thereby calibrate the model weights for a given organization-system context.

Table 1. Raw scores

Stakeholders (Designation)	Organisation Impact				Raw Score	System Quality				Raw Score
	OI_1	OI_2	OI_3	OI_4		SQ_1	SQ_2	SQ_3	SQ_4	
Director	4	5	4	5	4.5	4	3	2	4	3.25
Technical	6	4	6	4	5	5	3	2	4	3.5

Table 2. Proficiency scores

Stakeholders (Designation)	System	Business Process	Organisation
Director	4	5	6
Technical	6	4	5

4. RESEARCH METHODOLOGY

The study employs the ES-Success Measurement Model (Sedera et al., 2004; Gable et al., 2003) to measure the perceptions of employment cohorts[1]. The ES-Success Measurement Model employs 27 measures of success arranged under 4 dimensions (System-Quality, Information-Quality, Organizational-Impact and Individual-Impact). These 27 measures can be better interpreted using the intended scale. A survey instument will be provided to all the stakeholders in an organisation in order to collect this data. A separate instrument will be developed to understand the degree of profeciency of each stakeholder in the three areas: (i) system, (ii) business processes and (iii) the organization.

The following hypothetical example using the Organization Impacts and System Quality, together with extreme stakeholder group values (e.g. Director and Technical) demonstrate the value of such a weighted averaged scale. See details in table 1.

A separate survery instrument will be developed to understand the level of profeciency for each stakeholder group. The following example (table 2) demonstrates hypothetical profeciency scores measured in a 7 point Lickert scale. This example illustrates only the degree of profeciency and does not include the effect of weighted average score due to the lifecycle phase or foci of stakeholders on the raw scores.

Then for the final score:

Final Score = Raw Score * profeciency score / 7
Director OI = 4.5 * 6/7 = 3.9
Technical OI = 5 * 5/7 = 3.5

In the example, the Director's raw score for OI was 4.5 which was less than the Technical person's score of 5. By looking at only the raw score, one would then interpret that the technical person's evaluation of Organisation Impacts of ES is higher than the perceptions of the Director.

However, the raw score ignores the fact that one stakeholder group (i.e. director) is closer to the dimension that is under evaluation (i.e. OI) than the other stakeholder group (i.e. technical), thus the aggregation of stakeholders may provide misleading management information.

The weighted scores, using the level of proficiency, takes into account the knowledge that one would posses in the dimension that they evaluate. Having moderated the scores using the weighted averages by the profeciency level/score, the scores provide a more meaningful management information. In deriving the final score, for example, the Director would have a higher level of profeciency in the management or functioning of the organisation than the technical person.

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ENDNOTE

[1] The authors claim that ES-Success Measurement Model is the most comprehensive and complete model available to-date in the academic literature.