

Critical Success Factors of Information System Implementation in Practice: A Cultural Perspective

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Abstract: Critical success factors (CSF) evaluation is essential part of information system implementation. Information technology (IT) managers when confronted by the range of cultural and managerial styles, have difficulty in implementing information systems. In this paper, critical success factors of information system implementation were studied. This study used the grounded theory to produce a theory and framework about success factors affect information system implementation. Moreover, this study focused on the information system implementation from cultural perspective. This research presented that problems and obstacles in information system implementation are not technologically or technically, but they are emerged by organizational behaviour perspectives and organization culture issues.

Key words: Critical success factor • Information system implementation • Grounded theory • Organization culture

INTRODUCTION

The technological 'push' for the adoption of complete enterprise-wide integrated systems is becoming a major driver for information system (IS) development. This is typified by massive investments in enterprise resource planning (ERP) Systems extended backwards to the fully integrated supply chain and forwards with customer relationship management (CRM) systems [1]. In order to improve the implementation of information systems, this work proposed an effective approach to formulate critical success factor of implementation.

During the past decade, there has been increased interest in the impact of cultural differences (i.e. management attitudes, organization aspects and employees behaviour) on the development and implementation of information system. With the widespread diffusion of information technology (IT) on a global level, we continue to witness the same technology being used in many cultures. During implementation, many information systems face problems when dealing with the culture of different organizations [2].

The objective of this work was threefold: (1) it defined the organizational culture; (2) it presented the model for CSF of implementing information system ; and (3) it provided grounded theory to investigate the relationship between organization culture and information system implementation success factors. This research provided a grounded understanding of the practice of information system and IT solutions implementation. It explained the factors that influence the IS implementation in some large Iranian companies.

Background: Top management supporting is the most cited CSF in ERP implementation research [3]. Top management should have high commitment to divide required and valuable resources to IS project. Clear and regular communications among employees and project team members prevent implementation failures. Schein [4] presented the contemporary definition of organizational culture, including a set of behavioral and cognitive characteristics. Brown [5] argued that organizational culture could be divided into three layers, similar to those of Hofstede stated for national culture. In the outer layer,

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there are values about the strategies, mission and goals of the organization. In the middle layer, there are beliefs that the issues that the employees of an organization talk about. In the inner layer, there are those aspects of the organizational life that people find it difficult to recall and explain.

MATERIALS AND METHODS

The chosen methodology for this study was grounded theory. The emphasis in grounded theory is on new theory generation. Urquhart *et al.* [6] have suggested guidelines for grounded theory studies in information systems. According to Strauss and Corbin [7], the theory that is derived from the data is more likely to resemble what is actually going on. The analytical process involves coding strategies which is the process of breaking down data collection, observations and other forms of appropriate data into distinct units of meaning which are labeled to generate concepts. These concepts are initially clustered into descriptive categories. The concepts are then reevaluated for their interrelationships and, through a series of analytical steps, they are gradually ranked into higher-order categories.

Conducting the Grounded Theory Study: For resolving objectives of this research in phase 1, main question and related questions discussed in focused group. Accordingly, the motivation for our research originates in the premise that in practice companies are not implementing information systems effectively and efficiently. On this basis, we set out to answer two related research questions: What are the factors affecting success of information system implementation. This question is derived from actual problems and situations that are popular information system projects.

Preliminary Investigation of the Research Question Raised the Following Linked Questions:

- RQ1 what is the interrelationship of success factors?
- RQ2 what are the main barriers that exist within the organization to system implementation?
- RQ3 what are the problems that are constraining system implementation?

In second phase basic and preliminary model was developed regard related works [8,9] and researcher experiences, to help frame the study and test the data

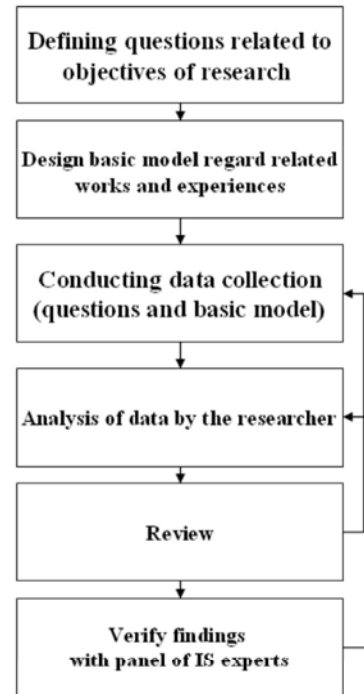


Fig. 1: Study phases

collection framework and approach. In third phase, data collection was undertaken. In the next phase collected data are analysed and in fifth phase the study and results are reviewed. Finally, findings are verified.

Sampling and Data Collection: Questions divided into three areas: management level, organizational level and user level. The data collection were transcribed and then coded by hand. Data collection started with an open sample, which consisted of large companies operating in the Iran. Companies selected and considered based on the following criteria: (1) companies with high level process maturity and (2) companies that had been successfully implemented their information systems. As the consequence of in-depth investigations, data collection is inherently very time-consuming. Thus, sample size was limited. The effect of small sample size was mitigated by careful selecting the excellent companies.

Analysis: Analysis was done to test and to make sure that the emergent theory was properly grounded. Data elements are statements that the research participant provides to the researcher in response to the research question. The data element is also a statement that provides details or different ways of describing the same phenomenon. After data analysis and mapping

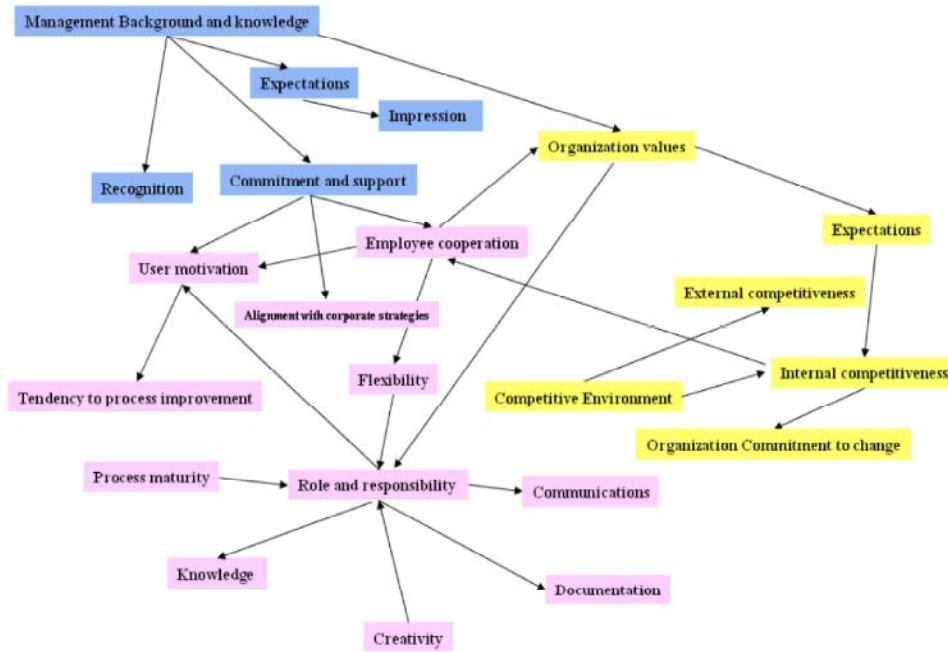


Fig. 2: The Network of Factors

Table 1: Themes and Categories

Theme	Category
User level	Motivation Alignment with corporate strategies Communication Recognition Process maturity Employee commitment
Organizational level	Organization values Internal competitiveness External competitiveness Expectations Environment Institutionalization of organizational culture Organizational Commitment to change Recognition
Management Level	Expectations Background Recognition Commitment and support Impression style
Core Category	Category
Role and Responsibility	Documentation Communications Flexibility Creativity Knowledge Employee cooperation

participant's opinion, the last list of themes, the core category and the main categories are identified (Table 1). The categories and the various relationships were then identified and joined to form the framework shown in Figure 2. Blue nodes are related to management features, yellow nodes are related to organization features and pink nodes are user's factors. Within the theoretical framework, each node is linked by a precedence operator with the node attached to the arrowhead denoting the successor.

Review and Verification: The need to test these provisional relationships drove the development of fifth phase, which involved the participation of five new companies and composed further data collections and investigations. Three of these data collections involved re-assess earlier participants, a technique available to grounded theory studies and supported by Goulding [10] as it allows for a comprehensive checking and verification of the data already analysed. Less time was spent on exploring issues which did not directly relate to the relationships and greater effort was made to ensure the categories and subcategories were fully evaluated.

In last step, researcher asked experts in information system domain from a well-known university and industry to verify findings. They were asked to verify that each concept belong with its category and that the name of the category accurately represents its meaning and relationship among factors.

RESULTS

The emphasis in grounded theory is on theory generation, where a theory is a set of well-developed categories (e.g. themes, concepts) that are systematically interrelated through statements of relationship to form a theoretical framework [7]. After study and review phase, last network of factors is verified and validated (Figure 1).

Table 2: Importance Weights for themes

Management Level	Organization Level	User level
0.3	0.3	0.4
0.4	0.2	0.4
0.3	0.3	0.4
0.6	0.15	0.25
0.5	0.1	0.4
0.4	0.25	0.35
0.6	0.1	0.3
0.45	0.15	0.4

Table 3: Summary statistics for importance weights in successful implementations

Variable	Mean	St Dev	Variance	Range
Management Level	0.4437	0.1178	0.0139	0.3
Organization Level	0.1938	0.0821	0.0067	0.2
User level	0.3625	0.0582	0.0034	0.15

Table 4: Two-Sample T-Test for Management Level and User level

95% lower bound for difference	Estimate for difference	T-Value	P-Value	DF
-0.003	0.0812	1.75	0.055	10

The importance weights for themes are shown in Table 2. The descriptive statistics of the sample are shown in table 3. According to table 3, the mean of management factor is 0.44 and user level is 0.36 respectively. It shows that management factor have more implementation trait. So, one can say that manager will try to enforce individualizing consideration traits. According to table 3 regarding descriptive statistics of themes, we can observe that organization level has lower mean.

According to one hypothesis, it is claimed that management level and user level have no difference. In other words, management level and user level should be treated equal. On this basis, testing hypothesis will be as follows. The mean of user level is lower or equal to management level. By using T-test, H0 is accepted or failed to reject (Tab 4). Regarding statistical table for management level, it is observed that this theme has high mean. Result of statistical T test shows that management factors are as important as user factors. Therefore, research suggests that IS implementaion manager in such firms should pay attention to management level and user level factors respectively to make behavioral and structural readiness for information system implementation.

DISCUSSION AND CONCLUSION

This paper used grounded theory to offer a new approach for investigation of information system implementation. In this study, success factors of

information system implementation were studied and presented. The main three success factors and related components were identified. Relationships of these factors and their components as a basic framework were developed. This framework has been evaluated by the experts. Weights of factors were extracted, analysed and related statistical results were displayed.

Results show that IS implementaion manager in such firms should pay attention to management level and user level factors respectively as cultural enablers to make behavioral and structural readiness for information system implementation. The use of grounded theory in this way has culminated in empirically valid theory and has the capacity for offer encouragement to other researchers to bring alternative methodologies to bear on aspects of systems implementation. The findings of this research contained useful lessons for managers who need to make decisions about factors related to information system implementation and culture effects as their organization improvements.

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