

# The Role of Management Control System in ERP Project Implementation

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***Abstract:*** Organizations adopt ERP system to increase the availability of information, have real time information to take decision, maximize the efficiency of business process, increase productivity, and for fast business process etc. When ERP projects implement successfully, it can take the organization to the new heights of profitability, but failure of it can throw the organization out of the markets.

***In this study, we consider two prospective of control system: first is interactive control system and second is diagnostic control system. These two control systems support to ERP implementation. Interactive control system supports organization change and increase employee motivation towards ERP implementation while diagnostic control system monitors the outcomes. Based on the extant literature review, we try to explore the role of management control system (MCS) in ERP projects implementation in organizations that can enhance the organization performance.***

***Keywords:*** ERP project implementation, Management control system, Interactive control system, Diagnostic control system

## I. INTRODUCTION

Growing demand for ERP projects on the one hand and the failure or out of control ERP projects on the other hand should certainly give the project managers a pause [4, 5]. In addition, it is well known by now that improper implementation of Enterprise Resource Planning (ERP) projects can cause considerable problems for organizations [1]. The main problems for the organization occur during the ERP projects implementation which is seen as employees are not ready to adapt or work on it, consequently it fails ERP projects. There are many critical success factors which are responsible for successful implementation of ERP such as: people, functional-led, change management, and training & education. Enterprise Resource Planning (ERP) system is a strategic tool which is used in organizational change management, integration of best business practices and improvements in productivity and producing various tangible and intangible benefits [6]. The ERP systems can support a company-wide data integration and management control but not necessary a companywide business process integration [28].

To introduce another term of this study, understanding the importance of management control system (MCS). In the present era, organizations need to use MCS that go beyond the technology, logistics, and marketing which are not sufficient to give the organization long-term competitive edge over its competitors. Traditionally, MCS can be defined as formal control and feedback system used to monitor organizational outcomes and correct deviations from the preset standards of performance [2]. But now these days, the role of MCS is shifted towards the flexibility, support organization change or strategic change, innovation and organizational learning [3].

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Moreover, management control system is formal, information-based routines that managers use to maintain or alter patterns in organizational activities [29]. From these findings, we drawing the attention towards the management control system and ERP projects implementation. As we all know, trying to implement ERP indicates that the organization is ready to adopt many changes. Above we already discussed that MCS foster the flexibility and support the organization or strategic changes. Based on these findings, we realized that MCS have great importance towards the ERP projects implementation in organizations. This motivates us to find relationships between the MCS and ERP implementation.

## **II. LITERATURE REVIEW**

In this section we first discuss about the state-of-the-art of the literature that deals with the management control system (MCS) and its classification; and ERP implementation. Then we will discuss about interrelationships between MCS and ERP projects implementation.

### **A. MANAGEMENT CONTROL SYSTEM (MCS)**

In the past decades, there are numerous studies are taken place in which identified the various definitions of management control system. For instance, Anthony (1965) defined MCS as the processes by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives. Moreover, Simons (1995) defines MCS as formal information based routines and the procedures managers use to maintain or alter patterns in organizational activities. According to Merchant and Otley [21] "a management control system is designed to help an organization adapt to the environment in which it is set and to deliver the key results desired by stakeholder groups, most frequently concentrating upon shareholders in commercial enterprises". Otley [20] argues that control system should have both monitor and support the employees for archiving the firm's goals. Anthony & Govindarajan [31] defined MCS as a set of activities with the purpose of ensuring compliance with management plans.

Some researchers talk about the classification of MCS in subcategories. Simons (1987 and 1990) argued that control systems are in four categories, namely: Diagnostic control system, Boundary control system, Interactive system, and Belief system. These levers can be defined as: Beliefs system used to inspire and direct the search for new opportunities; Boundary system used to set limits on opportunity-seeking behavior; Diagnostic control system used to motivate, monitor and reward achievement for specified goals; Interactive control system used to stimulate search and learning, allowing new strategies to emerge as participants throughout the organization respond to perceived opportunities and threats. These types of control system must apply in the organization that can maximizes operational effectiveness without limiting employee creativity. Moreover, Merchant and Van der Stede's [32] classify the four types of management control systems: results control, action control, personnel control and culture control. Result control influences the behavior of employees; action control ensures that employees are performed certain activities which are beneficial to the organization or not; personal control builds on the employee's natural tendencies to control and motivate; and cultural control are designed to encourage mutual monitoring.

Management control system helps to integrate, motivate, support in decision making, communicate objectives, give feedback, etc. In this study we particularly consider the interactive and diagnostic control system.

### **INTERACTIVE CONTROL SYSTEM (ICS)**

Interactive control system and enabling control system as part of the elements of MCS play effective role in employee involvement in organizations' activities. It is used by top managements to guide their strategy forming process in an informal way by implementing a personal familiarity, intimacy, or a closeness to the problem and commitment [30]. According to Simons [29] interactive control system has four defining characteristics:

1. Information generated by the system is an important and recurring agenda addressed by the highest levels of management.
2. The interactive control system demands frequent and regular attention from operating managers at all levels of the organization.
3. Data generated by the system are interpreted and discussed in face-to-face meetings of superiors, subordinates, and peers.
4. The system is a catalyst for the continual challenge and debate of underlying data, assumptions, and action plans.

## DIAGNOSTIC CONTROL SYSTEM (DCS)

The diagnostic control system seeks to ensure that decisions are aligned with the goals of the organization [29]. Simons [19] defines the diagnostic control system use as: 'Formal feedback system used to monitor organizational outcomes and correct deviations from preset standards. Diagnostic control system exemplified by business plans and budgets are the prototypical feedback systems used to track variances from preset goals and manage by exception. Analysis of critical performance variables influences the design of diagnostic systems.

Diagnostic use is associated with tight control of operations and strategies through sophisticated control systems [25]. DCS is also intended to motivate employees to perform and align their behavior with organization objectives and also enables managers to benchmark against targets [26].

According to Simons [19], diagnostic and interactive uses of MCS represent countervailing forces used to balance the inherent organizational tension. The combination of diagnostic and interactive control system is relevant for organizations due to the complementary perspective [23]. The diagnostic use operationalizes the original means for implementing intended strategies, the interactive use shall serve as a basis for the formation of emergent strategies [22]. From these findings, we see that both control system (interactive and diagnostic) are conducive to the implementation of ERP projects in the organization. In the next sub-section of literature review, we will investigate the link between the ERP implementation and control system.

## B. IMPLEMENTATION OF ERP

Enterprise resource planning (ERP) systems are integrated information systems, also referred to as packaged software, the key function of which is to integrate all core functions of an enterprise regardless of business type or charter [7]. In other words, it is an integrated set of programs that provides support for core organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resources [8]. Moreover, it also helps in sharing the data and knowledge, reduce costs, and improve management of business processes.

Implementation of ERP projects and conventional IT projects are two different things, it cannot be viewed as similar things. ERP project is not only the system of hardware and software, but also it is business process, organization structure and culture [7]. So, for the implementation of ERP there is different factors are needed such as people, change management and employee training & education. There are different organization strategies for conducive to ERP projects implementation such as change strategy development and deployment, change management techniques, project management, organizational structure and resources, managerial style and ideology, communication and coordination, and IS function characteristics [10-12]. In addition, Nah et al. [9] identified eleven critical factors for successful ERP implementation, these factors are ERP teamwork and composition; change management program and culture; top management support; business plan and vision; business process reengineering with minimum customization; project management; monitoring and evaluation of performance; effective communication; software development, testing and troubleshooting; project champion; appropriate business and information technology (IT) legacy systems. Adding on this, Motwani et al. [15] find that organizational environment, ready culture, and balanced network relationships are key factors to ERP success. Apart from these factors, such critical issues that must be carefully considered to ensure successful implementation include commitment from top management, reengineering of the existing processes, integration of the ERP with other business information systems, selection and management of consultants and employees, and training of employees on the new system [17].

A survey of CIOs (chief information officers) of Fortune 1000 companies shows that change management program and culture is one of the top five CSFs for ERP implementation success [9]. A successful ERP system will streamline processes within a company and improve its overall effectiveness, while providing a means to externally enhance competitive performance, increase responsiveness to customers, and support strategic initiatives [33]. ERP projects have lots of tangible and intangible benefits, such as inventory reduction, information visibility, productivity improvements, procurement cost reduction, flexibility, customer responsiveness, and order management improvements [13]. In addition, ERP has had a positive impact on the ability of businesses to improve working capital, implement a total quality management (TQM) culture, lower inventory levels, optimize raw materials and sell and deliver products to the customers [24]. In spite of these benefits most of the ERP systems are fails. ERP implementation is a complicated largescale project, has far-reaching strategic and organizational implications, and can easily turn into a nightmare for implementing firms [14]. In this study we focus on how to successful ERP implementation in the organization. Moreover, we identified that how MCS helps in the implementation of ERP. For the successful implementation of ERP, the first thing is that adapt the changes and the

system through employees in organization. This figure depicts the successful ERP adoption. This figure 1, describes communication, groups, top management support are conducive to ERP implementation in the organization.

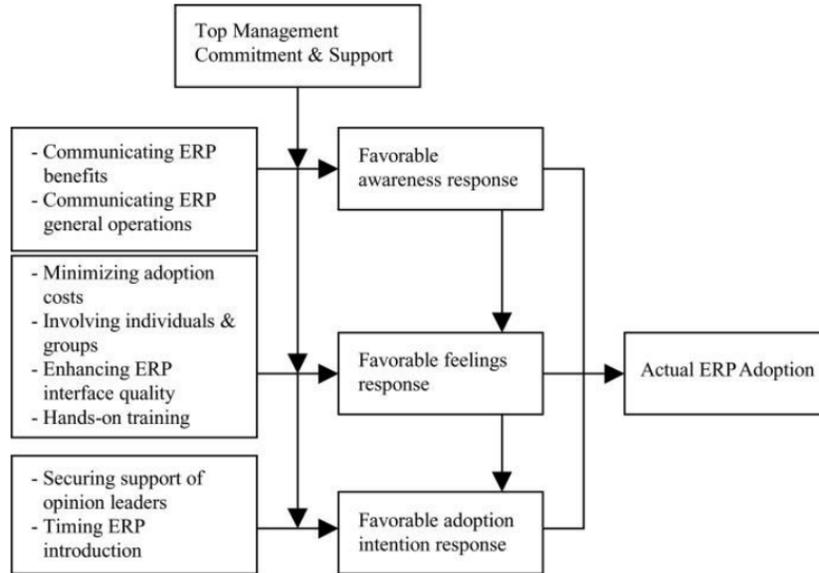


Figure 1: A model of successful ERP adoption. Source: Aladwani [8]

### III. DESIGN/METHODOLOGY/APPROACH

The paper draws from literature and experiential knowledge of the authors in the ERP and MCS to address the objective of the paper. This paper also provides an overview of qualitative research methodology used to identify the relevant information from the large volume of literature on management control system and ERP projects, which is based on relevant journals, articles, working papers, and review of company's annual reports. This paper use traditional literature based methodology for reaching the findings and conclusions. Based on the literature survey, we develop some propositions.

### IV. THEORY AND PROPOSITIONS

In summary, the literature review has identified several arguments some of are positive and some of negative, in postulating the nature of relationship between the management control system and ERP implementation. In this section, we are trying to find out that how management control system support to ERP projects implementation.

#### A. MCS AND ERP PROJECT IMPLEMENTATION

Diagnostic use of MCS is the traditional feedback system in which system's monitor the outcomes and reward the achievement of pre-established goals, while interactive use of MCS are used to expand opportunity seeking, supporting change and learning throughout the organization. Diagnostic use represents a mechanistic control used to track, review and support the achievement of predictable goals, and interactive use is an organic control system supporting the emergence of communication processes and the mutual adjustment of organizational actors. Both control system provides motivation and direction to achieve goals; and work simultaneously but for different purpose [25]. Based on these findings, interactive and diagnostic control are relevant of ERP implementation.

Implementing an ERP causes massive change that needs to be carefully managed to reap the benefits of an ERP solution [17]. But on the other hand, sometime people are not ready to accept the changes even these changes are beneficial to the organization. As we already discussed in the literature review section, management control system are managing the organization and strategic changes, and foster the flexibility. So, if the organization during the implementation phase of ERP projects use the interactive control system, then the ERP system will achieve the success. Interactive control system is the 'Formal system used by top managers to regularly and personally involve themselves in the decision activities of subordinates [19].

Simons [19] defines the diagnostic control system use as: ‘Formal feedback system used to monitor organizational outcomes and correct deviations from preset standards. Due to such feedback system we know regularly what is going on to ERP implementation. Diagnostic use of control system helps to monitor the ERP projects outcomes whether the outcomes are positive or negative.

Adding on this, in a survey of the IT managers responsible for managing their organization’s ERP projects [18]. From this finding, we can say that managers are most responsible person for success and failure of ERP projects. Management control system (MCS), this is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s aims. MCS process or tools which is used by the managers. In addition, Management control system help to integrate, motivate, support in decision making, communicate objectives, give feedback, etc. Based on these findings, we can say that there is positive relationship between the successes of ERP projects implementation and MCS. Consequently, IT managers should use proper control system for the successful implementation of ERP projects.

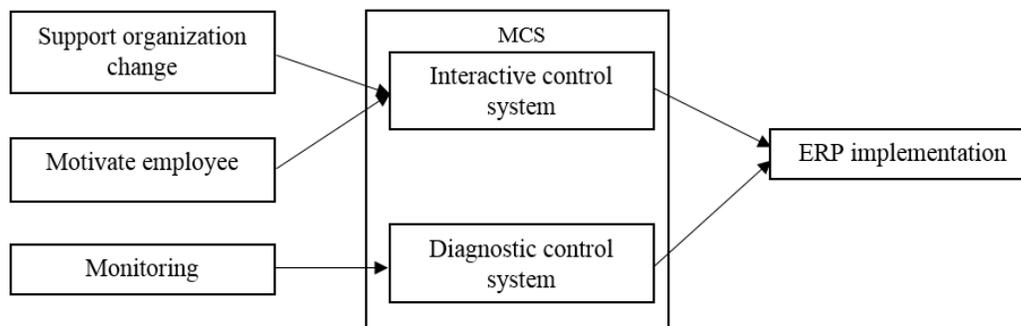


Figure 2: Research Framework

Based on the literature survey we posited there propositions:

***P<sub>1</sub>: Diagnostic use of control system monitor outcomes to ERP projects implementation.***

***P<sub>2</sub>: Interactive use of control system support organization changes to ERP projects implementation.***

***P<sub>3</sub>: Interactive use of control system motivate employee to successful ERP projects implementation.***

## V. CONCLUSION

The purpose of this study was to concentrates on how management control system play a vital role in successfully ERP implementation. The existing literature on ERP system shows that even if the system have lot of benefits to the organization, yet most of the ERP projects fails. As many organizations have exposed, the implementation of ERP system can be a colossal disaster unless the process is controlled cautiously [27]. On the basis of literature survey of MCS, we found that interactive and diagnostic control system both are relevant for ERP implementation. Interactive use of control system support organization change and increase employee motivation towards ERP implementation, diagnostic use of control system monitoring the outcomes. So, finally we conclude that management control system have a significant role in ERP implementation.

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