

Do accounting benefits of ERP systems impact the satisfaction of end-users? From the perspective of accountants and internal auditors in Sri Lanka

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Abstract

Research Question: What are the accounting benefits perceived by accountants and internal auditors that entail through Enterprise Resource Planning (ERP) systems? Is there an interaction of ERP accounting benefits with the accountants' and internal auditors' satisfaction level in using ERP systems?

Motivation: Many organizations are implementing ERP systems extensively while sharing a common database and being real-time. Past scholars summon empirical studies on ERP's impact on accounting benefits and user satisfaction. Therefore, this study was conducted from accountants' and internal auditors' perspective as recent scholars shed light on the cruciality of these two groups' perceptions as key ERP users.

Idea: This study examines the accounting benefits that entail through the adoption of ERP systems by Sri Lankan companies with regard to ERP user satisfaction from the perspective of accountants and internal auditors.

Data: The data were collected from 38 accountants and 19 internal auditors across 24 companies that are implementing ERP systems for more than four years.

Tools: A quantitative survey methodology is employed to draw empirical evidence.

Findings: The findings confirm that organizational, operational (time), and IT accounting benefits derived from ERP systems significantly and positively influence ERP users' satisfaction. In contrast, operational accounting benefits (cost) received the lowest rating and did not significantly influence user satisfaction.

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Contribution: While these findings are valuable to accountants and internal auditors to better understand the ERP accounting benefits, ERP consultants and system providers also benefit from identifying ERP accounting features to uplift user satisfaction in developing countries.

Keywords: Enterprise Resource Planning (ERP) systems, accounting benefits, accountants and internal auditors, user satisfaction.

JEL codes: M41

1. Introduction

Current evolution in the business environment, namely globalization, privatization, and deregulation, have enhanced large organizations into giant multinational companies. This dynamic business environment has convinced organizations to search for new ways to survive and succeed. Thus, information technology offers a variety of tools and techniques for organizations to face positively to these changes. One such tool is the Enterprise Resource Planning systems (ERP), which integrates several business procedures, applications, and departments such as accounting, finance, and marketing while sharing a common database and helping organizations to provide real-time information (Alaskari *et al.*, 2019). The implementation of these systems significantly affects all areas of accounting processes, leading to reforming the roles of management and financial accountants and assisting in enhancing the productivity of the entire organization, including the accounting department (Sutton, 2006). According to Sardo and Alves (2018), the financial and accounting module of ERP systems is an essential core module that typically becomes the first module activated in an ERP system. Therefore, organizations must be conscious enough to realize the impacts of ERP implementation in terms of accounting benefits and how these perceived benefits are evaluated by different users (Sutton, 2006). However, only a few research have been conducted globally regarding ERP accounting benefits and how this ERP system implementation affects the role of accounting.

Past scholars have revealed numerous advantages of ERP systems for organizations. Accordingly, ERP systems have become the backbone of some major organizations in the corporate world by transferring integrated information (Abbasi *et al.*, 2014). On the other hand, several past studies such as Mahdavian and Mostajeran (2013), and Mahmood *et al.* (2019) have found that some companies namely FoxMeyer Drug, Dell computer, Mobile Europe Hershey, Whirlpool, Hershey Foods, Boeing, Applied Materials, Kelloggs, and Nestle faced critical problems with the implementation of their ERP systems in terms of effective communication, change management, system integration, usability, top management approach and security. Therefore, these contradictory outcomes show no universal consensus on the impact of ERP implementation on uplifting an organization's performance (Alomari *et al.*,

2018). Hence, scholars and practitioners are highly interested in analyzing factors determining ERP systems' success or failure.

Over the past decade, most companies worldwide have invested a massive amount of money in ERP systems since the 1990s (Wieder *et al.*, 2006). However, despite this considerable investment, Slabbert *et al.* (2016) state that the benefits entailed by ERP systems are not consistent, the benefits realized by one organization may differ from another, and some benefits could be worth nothing. Therefore, over the years, some companies have gained benefits, and other organizations have ended with critical issues because many organizations do not provide adequate consideration on producing strong business cases before implementing an ERP system (Mukwasi & Seymour, 2014). Furthermore, they argue that most companies do not properly understand what benefits can be obtained for a particular department and whether the cost of implementing an ERP system can be justified with these benefits.

Organizations adopting ERP systems typically focus on monetary and technical aspects of the ERP implementation process, and a little attention is given to non-technical issues (Hasibuan & Dantes, 2012). Therefore, a trivial consideration of crucial measurement factors such as user involvement, user satisfaction, top management support, communication, culture readiness, change management, and organization maturity level in ERP implementation projects might lead to failure instead of success. Compared to the above measures, ERP user satisfaction is a more important factor among them that evokes whether the key users of ERP systems are satisfied or not with the value provided by ERP systems to accomplish their tasks (Yassien *et al.*, 2017). As Doll and Torkezadeh (1988) argue, the success of ERP implementation depends on the viewpoint from which users evaluate it. Within the ERP environment, user satisfaction refers to the extent to which users appraise that ERP software is accessible to satisfy their needs (Dezdar, 2012). However, Kanellou and Spathis (2013) argue that, even though this factor is critical for organizations, there are limited studies conducted on a global scale regarding the ERP accounting benefits and ERP users' satisfaction from multiple evaluator viewpoints. Among those ERP users, accountants and internal auditors are identified as critical executors in modern organizations who have a thorough understanding and knowledge of financial and accounting concerns within an ERP environment (Madani, 2009; Nguyen *et al.*, 2020). As Weshah (2020) indicates, ERP systems significantly impact internal auditors' operational performance. However, a limited number of studies have been conducted from the perspective of accountants and internal auditors as ERP users who work closely with such systems (Nguyen *et al.*, 2020; Salur & Kattar, 2021). Hence, more importantly, this study considers accountants and internal auditors as the key ERP users.

As a developing country, there is a huge trend currently prevailing in Sri Lanka that companies are shifting from conventional information systems (IS) to ERP systems (Silva *et al.*, 2011). Further, Wickramasinghe and Gunawardena (2010) have

mentioned that most of the organizations in Sri Lanka have not achieved predetermined organizational goals and ended up with critical problems due to a lack of knowledge about the attributes of ERP systems. Charmis (2018) emphasizes that perceived ERP benefits are highly influenced by language, politics, culture, government regulations, management style, and employees' skills in different contexts. Therefore, Sri Lankan companies cannot expect similar performances of ERP systems that were implemented in other contexts (Haleem *et al.*, 2019). Hence, this study aims to glimpse into the accounting benefits of Sri Lankan companies in adopting ERP systems.

Based on the previous arguments, there is a scarcity of information in developing countries like Sri Lanka regarding the accounting benefits that may entail through the adoption of ERP systems and whether ERP users such as accountants and internal auditors are satisfied with these benefits. Hence, this study is conducted to achieve the following research objectives. 1) To investigate accounting benefits perceived by accountants and internal auditors that may entail through adopting ERP systems by companies in Sri Lanka and 2) To measure the interaction of ERP accounting benefits with the accountants' and internal auditors' satisfaction level. The remainder of this paper is organized as follows: Section two begins with the literature review. Section three explains the theoretical foundation and the methods used. Section four presents the study's empirical results, and, finally, the paper concludes with findings and implications.

2. Literature review

2.1 The advantages of moving into ERP systems

A number of studies have been conducted to assess the reasons behind organizations' steps to replace conventional information systems (IS) with ERP systems by focusing on the benefits of ERP systems that enhance organizational performance (Kanellou & Spathis, 2013). Buonanno *et al.* (2005) state numerous reasons influence organizations to implement ERP systems. Accordingly, when firms disregard to implement of an ERP system, they may have to face multiple issues such as trouble in managing different software for separate organizational functions, more effort and time consuming to access the most crucial information for decision making, inaccurate inventory management, lack of meeting customer expectations and difficulties in handling accounting and financing activities (Abbasi *et al.*, 2014; Buonanno *et al.*, 2005; Maditinos *et al.*, 2012).

Apart from the above, some studies aim to investigate the benefits derived from the implementation of ERP systems. Colmenares (2009) and Chang (2006) indicate that firms could improve the coordination across the different departments, reduce the repeated data entry works and generate more real-time reports using ERP systems. Olhager and Selldin (2003) note that companies using ERP systems experience an

enhancement in performance primarily from the information perspective since it improves accessibility, reliability, and quality of the information. Moving forward, currently, most organizations deploy Cloud ERP systems because it offers numerous benefits over on-premises ERP systems, such as lower cost and speed for implementation, faster accessibility, sales automation, scalability, higher security, and higher flexibility compared to on-premises ERP systems. Therefore, it is possible to see that most scholars have confirmed that ERP solutions enhance organizational performance in many aspects (Elmonem *et al.*, 2016).

2.2 ERP benefits classifications

Past scholars have identified ERP benefits under several categories considering multiple dimensions. O' Leary (2004) suggests that the benefits derived from ERP systems can be classified into tangible and intangible. In specific, tangible benefits are widely industry-independent, while intangible benefits differ across industries. Consequently, Shang and Seddon (2002) have proposed a comprehensive framework that divides ERP benefits into operational, managerial, strategic, IT infrastructure, and organizational benefits. Esteves (2009) has developed an ERP advantages realization roadmap for small and medium-sized organizations based on Shang and Seddon's (2002) benefits classification. Chand *et al.* (2005) suggest a framework to identify the ERP benefits using the Balanced Scorecard (BSC), afterward called the ERP scorecard. However, the conventional Balanced Scorecard categorizes ERP benefits using processes, customers, finance, and innovation. Moreover, Sadrzadehrafiei *et al.* (2013) and Trinoverly *et al.* (2018) have categorized ERP benefits into financial, sales and marketing, human resources and operational, and logistics benefits. Moving towards the accounting benefits, Spathis (2006), more specifically, has analyzed the accounting benefits of ERP systems by further extending Shang and Seddon's (2002) benefit categorization. Accordingly, Spathis (2006) divide accounting benefits into four groups, namely operational accounting benefits, organizational accounting benefits, managerial accounting benefits, and IT accounting benefits. Later, Kanellou and Spathis (2013) combined ERP accounting benefits which were found by O' Leary (2004), Spathis (2006), and Esteves (2009). Furthermore, several recent authors, such as Goumas *et al.* (2018) and Estebanez (2021), have used Kanellou and Spathis's (2013) benefits classification in their studies. Therefore, we can conclude that different scholars have upgraded and combined ERP benefits and their categories according to new technical transformations.

2.3 ERP accounting benefits and their variety in different contexts

The adoption of ERP systems has enhanced the performance of accountants and reshaped the entire accounting process. Accordingly, ERP solutions have improved the flexibility and efficiency in information generation, integration of accounting software, accuracy and quality of financial statements, and the reliability of decisions

(Spathis & Constantinides, 2004; Sutton, 2006; Velcu, 2007; Colmenares, 2009). As Abbasi *et al.* (2014) and Malinic and Todorovic (2012) indicate, ERP systems improve the decision-making process by providing real time information to keep up with dynamic market competition and measuring performance. Similarly, Suhaimi *et al.* (2016) reveal that ERP systems function as a management control system by recognizing wastage at the earliest possible time. Further, they mention that the accountant's role is upgraded with the ERP systems adoption as they can commit more time to financial analysis and strategic thinking by moving away from data entry chores. Thus, according to Shang and Seddon (2002) and Spathis (2006), ERP accounting benefits can be defined as the benefits that an organization gains for its accounting practices from their use of the ERP system. Kanellou and Spathis (2013) more specifically identify ERP accounting benefits under four dimensions, namely IT, operational, organizational, and managerial accounting benefits. Hence, ERP systems inevitably enhance modern enterprises' operational efficiency while optimizing various corporate functions such as accounting and finance.

Past studies have examined ERP accounting benefits from different contextual perspectives and found that various factors influence the determination of such uses. As, O' Leary (2004) and Goumas *et al.* (2018) mention, ERP accounting benefits vary based on the industry and the nature of the business, such as manufacturing organizations experiencing various benefits compared to other organizations. Apart from that, some firm-specific factors such as management style, labour skills, and technological competencies of a firm also influence the ERP systems' productivity (Gupta *et al.*, 2018). In addition, Charamis (2018) emphasize that national-level differences such as the culture, government regulations, labour skills, and infrastructure availability in a country also affect ERP implementation practices in different countries. Therefore, ERP accounting benefits are inconsistent for organizations in other contexts. Furthermore, most ERP system performance-related studies focus on developed countries rather than developing countries (i.e. Kanellou & Spathis, 2013; Weli, 2014; Tarhini *et al.*, 2015). Thus, there is a lack of studies conducted to check whether these benefits are derived in an identical way for developing countries like Sri Lanka.

2.4 User satisfaction as a measurement tool

Several scholars have attempted to measure the effectiveness and overall performance of ISs and ERP systems by evaluating perceived user satisfaction. Almajali *et al.* (2016) suggest that the level of user satisfaction depends on the extent to which a user perceives that a system achieves their benefits requirements. Therefore, the extent of user satisfaction could be identified as one of the most crucial measurements to determine the success or failure of an information system. Furthermore, Yassien *et al.* (2017) mention that user satisfaction is a critical component of business strategies to achieve the expected organizational productivity. Hence, "user satisfaction" could be used as an important measure to evaluate an

information system's effectiveness, such as ERP systems influencing organizational success.

Based on the previous literature, we can see a noticeable drift even among the developing countries that shift into integrated ERP systems to obtain specific organizational benefits (for example, Fernandez *et al.*, 2017; Trinoverly *et al.*, 2018). Furthermore, this integrated system implementation leads to modifying the roles of the organization's personnel and enhancing the productivity of the entire organization, including the accounting department. However, further research findings confirm that these ERP benefits are inconsistent in different contexts, such as countries, industries, and business models. Also, user satisfaction is identified as one of the crucial non-technical factors determining an ERP implementation's success because the success of ERP implementation depends on the viewpoint from different users as how they evaluate it (Doll & Torkzadeh, 1988). Initially these scholars have developed a twelve-item survey instrument to measure "user satisfaction" and categorized those items into five groups: content, accuracy, format, ease of use, and timeliness. A few years later, when organizations began to implement ERP systems more extensively, many other scholars (see for example Law & Ngai, 2007; Somers *et al.*, 2003; Wu & Wang, 2007) have evaluated the user satisfaction of ERP systems using Doll and Torkzadeh's (1988) instrument. Further, Wu and Wang (2007) confirmed that this instrument keeps its psychometric stability when applied to measure the satisfaction of users of ERP systems. Furthermore, they emphasized that perceived usefulness is one of the major determinants which affects to key users' satisfaction with ERP systems. Although past scholars have examined different types of ERP benefits and variances in ERP users' perceptions concerning those ERP benefits and their satisfaction, still there is a scarcity of studies in developing countries such as in Sri Lanka that assess whether those countries also obtain similar ERP accounting benefits as well as whether there is a significant relationship between those ERP accounting benefits and ERP user satisfaction.

2.5 Accountants and internal auditors as key ERP end users

Studies were carried out on ERP benefits and satisfaction among different groups of users. Saade and Nijher (2016) have demonstrated that different ERP users perceive benefits and their satisfaction related to the received benefits have a critical effect on the success of ERP systems. Initially, Chang (2006) has compared the benefits and importance of the enterprises' information systems in high-tech organizations from the general management and IT professional's perspective. The author claims that general management and IT personnel have similar perceptions of IS implementation. Moving forward, Kanellou and Spathis (2013) examine whether there is a difference between IT professionals and accountants concerning how each group estimates ERP benefits and user satisfaction. The results indicate no significant variance between their perceptions of ERP benefits. Furthermore, Longinidis and

Gotzamani (2009) have examined the ERP systems' satisfaction levels across different organizational departments. Their results indicate that users in all departments, such as sales, marketing, manufacturing, and supporting, are satisfied with ERP systems except those in the network department.

Although many studies examine the perception of ERP effectiveness and performance from several users' standpoints, there are limited studies that have examined the perceptions of accountants and internal auditors regarding their satisfaction and the accounting benefits obtained from ERP systems. Therefore, this study aims to fill this gap by considering accountants and internal auditors as ERP users. Accountants are selected as one of the group stems for the present study because the accounting professional group is highly affected by the adoption of ERP solutions, and the entire accounting profession is being modified due to technological enhancements (Calu *et al.*, 2017). Further, Alhatabat (2020) indicates that moving into an ERP system significantly influences the role of managerial and non-managerial accountants. The second group selected for this study is internal auditors. Elbardan and Kholeif (2017) mention that internal auditors are one of the critical actors who influence modern firms' effectiveness because organizations recognize the importance of strong internal audit functions in ensuring the organization's long-term survival. According to AL-Theebbeh *et al.* (2018), internal auditing processes become modified under the ERP environment, positively contributing to organizational effectiveness. As Haleem *et al.* (2019) mention, internal auditors benefit from the modified accounting tools. Furthermore, Tsai *et al.* (2013) argue that if internal auditors are not satisfied with the ERP system's effectiveness, they may not utilize the ERP system effectively when engaging in their duties. Therefore, internal auditors' satisfaction with ERP systems is crucial in measuring the success of implementing ERP systems.

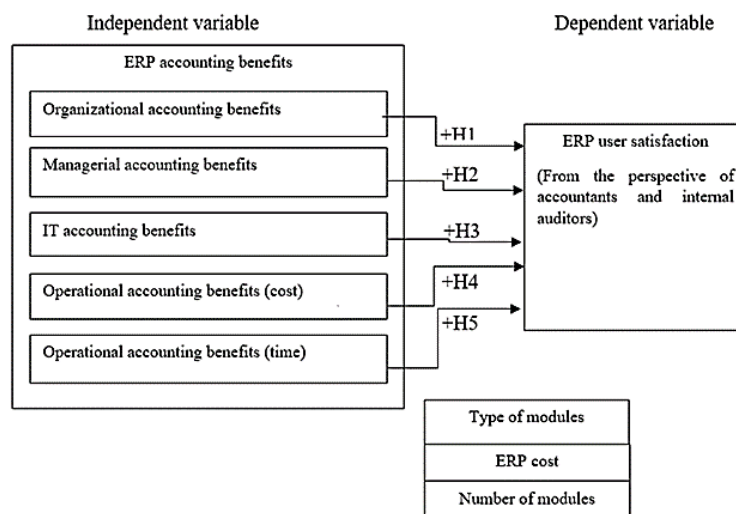
3. Theoretical foundation and methods

As Kanellou and Spathis (2013) indicate, the consequences of ERP systems adoption have been examined by past scholars from different theoretical lenses such as stakeholder theory, actor-network theory, hybridization (combination of both IT professionals and accounting professionals), discourse theory and innovation and diffusion theory. These theories justify the impact of ERP implementation on users in different perspectives. Doll and Torkzadeh (1988) suggested that it is vital to study end-user satisfaction in relation to the benefits they perceived as a component of measuring the effectiveness of an information system. However, as Kanellou and Spathis (2013) further explained, there is no specific theoretical model to measure the effect of ERP accounting benefits on end user satisfaction in relevant literature and therefore, they have proposed a model, building on the existing literature to show how accounting benefits and related variables such as number/type of ERP modules and ERP cost affect accountants' and IT professionals' satisfaction. Their model

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

comprises with ERP accounting benefits that were initially proposed by Shang and Seddon in 2002 and further developed by subsequent authors such as Spathis (2006) and Annamalai and Ramayah (2011) in their studies. Accordingly, five ERP accounting benefits are identified as organizational, managerial, operational (time), operational (cost), and IT accounting benefits. Moving forward, past researchers tend to investigate ERP benefits and the impact of these benefits on end-user satisfaction from different ERP users' viewpoints (see Abbasi *et al.*, 2014; Sadrzadehrafiei *et al.*, 2013; Yeh, 2006). However, a limited number of studies have been conducted from the perspective of accountants and internal auditors as critical actors in modern organizations who experience financial and accounting concerns within an ERP environment (Madani, 2009; Nguyen *et al.*, 2020). Hence, this study considers accountants and internal auditors as the key ERP users. Most of the past studies have identified ERP benefits from multiple perspectives. This study examines ERP accounting benefits that was initially proposed by Shang and Seddon in 2002 and investigates the effect of ERP accounting benefits on the ERP users' satisfaction by employing the model proposed by Kanellou and Spathis (2013). Apart from the above accounting benefits, past studies such as Chen *et al.* (2012), Ehie and Madsen (2009), Hassan and Mouakket (2016), and Spathis (2006) highlight several factors that may impact ERP user satisfaction in addition to the above ERP benefits including type of ERP modules, number of ERP modules, and ERP cost. Thus, the current study uses these three components as control variables which may also impact ERP user satisfaction. Considering the above, the following figure 1 presents the conceptual model developed in the present study.

Figure 1. Conceptual framework of the study



Source: Kanellou and Spathis (2013) and ERP accounting benefits initially proposed by Shang and Seddon (2002).

The present study develops the following hypotheses based on the above theoretical relationships and empirical findings.

H₁: Organizational accounting benefits positively impact on ERP user satisfaction.

H₂: Managerial accounting benefits positively impact on ERP user satisfaction.

H₃: IT accounting benefits positively impact on ERP user satisfaction.

H₄: Operational accounting benefits (cost) positively impact on ERP user satisfaction.

H₅: Operational accounting benefits (time) positively impact on ERP user satisfaction.

The operationalization of variables is included in Appendix A.

3.1 Model specification

The impact of ERP accounting benefits on ERP user satisfaction is measured using a multiple regression model. In line with the aforementioned exploratory framework, the regression model is developed based on the studies conducted by Kanellou and Spathis (2013) and Spathis (2006) as follows:

$$EUS_i = \alpha_0 + \beta_1 OAB_i + \beta_2 MAB_i + \beta_3 IAB_i + \beta_4 OAC_i + \beta_5 OAT_i + \beta_6 TEM_i + \beta_7 NEM_i + \beta_8 EC_i + \varepsilon_i$$

Where; EUS is ERP user satisfaction, OAB is organizational accounting benefits, MAB represents management accounting benefits, IAB is IT accounting benefits, OAC is operational accounting benefits in-terms of cost, OAT is operational accounting benefits in-terms of time, TEM represents the type of ERP modules, NEM is the number of ERP modules, and EC is ERP cost.

Before the regression analysis, an independent sample T-test is conducted to examine whether there is a statistically significant difference in responses between accountants and internal auditors. T-test results are presented in Table 4.

3.2 Sample and data collection

Following the quantitative methodology, this study has collected the required data using a primary self-administered questionnaire. Responses were ranged on a 7-point Likert-type scale ("Not at all"=1 to "Perfect"=7) to conduct the analysis. The questionnaire consists of five parts as the first section concerns the information related to ERP software. The second section referred to accounting benefits derived from the ERP system. In the third section, four questions measure the extent of user satisfaction. The fourth and fifth sections have included questions related to company and respondent characteristics, respectively (Refer to Appendix A for the survey questions).

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

Since this study is conducted from the accountants' and internal auditors' perspective, the total population comprises the accountants and internal auditors in organizations implementing ERP systems in Sri Lanka. A purposive sampling technique has been applied to select these ERP users because it is appropriate for survey research, especially when the research questions being addressed are specific to the characteristics of a particular group of interest (Rai & Thapa, 2015). Accordingly, the researcher contacted one of the leading ERP software providers to obtain a list of organizations that have bought and implemented ERP software packages in Sri Lanka. This customer list consists of 24 companies belonging to different industries, and the questionnaire was e-mailed to accountants and internal auditors who work in these organizations. It includes 40 accountants and 20 internal auditors, resulting in the sample of this study being 60. Furthermore, this sampling method is consistent with the relevant studies in other contexts (Almahamid, 2019; Chairunnisa, 2019; Nguyen *et al.*, 2020).

4. Empirical results

4.1 Demographic and general information analysis

The questionnaire was e-mailed to the 40 accountants and 20 internal auditors of the sample of 24 companies. However, 56 participants out of 60 responded. Therefore, the response rate of the survey is 93%. According to Dillman (2011), the average response rate for company-specific surveys is 40%. Thus, the response rate of the present study is above average.

Table 1. Demographic and general information

Demographic variable		Frequency	Percentage
Position of the respondents	Accountants	38	67.90%
	Internal Auditors	18	32.10%
Total work experience of respondents	5-6 years	10	17.90%
	7-8 years	16	28.60%
	8-10 years	15	26.80%
	10-12 years	6	10.70%
	12-14 years	6	10.70%
Number of years that organizations have the ERP system been used	4 years	20	35.70%
	5 years	19	33.90%
	6 years	14	25.00%
	7 years	3	5.40%
	Consumer Discretionary	5	8.90%
	Consumer Staples	8	14.30%

Demographic variable		Frequency	Percentage
The type of industry that respondents belong to	Financial	8	14.30%
	Health Care	8	14.30%
	Industrials	4	7.10%
	Information Technology	3	5.40%
	Materials	9	16.10%
	Real Estate	2	3.60%
	Telecommunication Services	3	5.40%
	Utilities	6	10.70%

As Table 1 shows, 67.9% (38 accountants) of the sample comprised accountants, while 32.1% (18 internal auditors) of the sample consisted of internal auditors. According to Wu and Wang (2007), the total work experience and work experience of the current position of the ERP users are the most vital factors that should be considered in measuring ERP user satisfaction. Accordingly, almost all the respondents had more than four years of experience. In respect of the number of years that the respondent's organization has utilized the ERP system, almost all the respondents have used the ERP system for more than four years. Nguyen *et al.* (2020) state that measuring its success should take at least four years after implementing the ERP system. Hence, the companies included in this sample have used ERP systems for more than four years.

The industry to which the organization belongs is another crucial factor when looking at ERP system implementation. As per the literature, it is identified that some industries tend to utilize ERP systems more than others due to the nature and the complexity of the business process. However, in this study, 16.1% of respondents belong to the "Material industry," which is the highest response percentage. The remaining large number of respondents belong to the "consumer staples," "financial," and "health care" industries, respectively. However, fewer respondents belonged to the "Information technology" and "Real estate" industries in Sri Lanka.

4.2 Reliability of data

The reliability of data has been measured using "Cronbach's Alpha" for each variable, and results are presented in Table 2. According to Taber (2018), the scale is reliable if the coefficient value is higher than 0.7. Therefore, the data set fits reasonably into the research problem and questions. Thus, the data set is appropriate for carrying out the analysis. The Cronbach's Alpha value for Operational accounting benefit (Cost) variable has not been calculated as it has one question.

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

Table 2. Cronbach's alpha test

Variable	Cronbach's Alpha	No. of Items
Organizational accounting benefits	0.876	6
Operational accounting benefit (Time)	0.855	5
Managerial accounting benefits	0.878	3
IT accounting benefits	0.867	5
User satisfaction	0.872	4

4.3 Test of multicollinearity

The pairwise correlation results indicated that all the correlation values among independent variables are less than 0.9 except the correlation value between "managerial accounting benefits" and "organizational accounting benefits." Further, the variance inflation factor (VIF) values of all variables indicated below 10 except VIF values of the "managerial accounting benefits" and "organizational accounting benefits" (See Table 3). Therefore, the "managerial accounting benefits variable" has been dropped from the analysis to rectify the multicollinearity issue.

4.4 Correlation analysis

According to the correlation coefficient values and their significance, all independent variables, including organizational accounting benefits, operational accounting benefits (Time), operational accounting benefits (Cost), and IT accounting benefits, indicate a high positive correlation with the dependent variable, ERP user satisfaction. Therefore, the variables are appropriate to test hypotheses using regression analysis.

Table 3. Correlation and VIF results

	OAB	OAT	OAC	IAB	EUS	VIF Value
OAB	1					8.433
OAT	.821 .000	1				9.610
OAC	.892 .000	.801 .000	1			7.398
IAB	.895 .000	.805 .000	.802 .000	1		9.230
EUS	.880 .000	.809 .000	.871 .000	.864 .000	1	

4.5 T-Test analysis

The perceptions of accountants and internal auditors concerning ERP accounting benefits and degree of user satisfaction are compared through the results obtained through T-test analysis (See Table 4).

Table 4. T-test Analysis

	Accountants		Internal auditors		Sig. (2-tailed)
	mean	Std dev	mean	Std dev	
Organizational accounting benefits	5.67	.813	5.65	.970	.955
IT accounting benefits	5.85	.869	5.88	.758	.897
Operational accounting benefit (Cost)	2.94	.898	2.88	.900	.821
Operational accounting benefit (Time)	5.33	.880	5.20	.955	.625
ERP user satisfaction	5.76	.770	5.29	.957	.041

Note: Scale represents 1=not at all, 2=very low degree, 3=low degree, 4=average, 5=high degree, 6=very high, 7=perfect

The probability values of all the accounting benefits are higher than 0.05, which means there is no statistically significant difference between the perceptions of accountants and internal auditors concerning the ERP accounting benefits. However, we can see that these two groups' perceptions of "ERP user satisfaction" are significantly different at a 0.05 level of significance ($p= 0.041$). Thus, the results demonstrate that, although accountants and internal auditors rated higher ERP user satisfaction, accountants are comparatively more satisfied than internal auditors regarding those ERP accounting benefits.

4.6 Data analysis

The data analysis is divided into two sections. The first section presents the ERP accounting benefits perceived by ERP users, and the second section presents the impact of ERP accounting benefits on ERP user satisfaction.

According to the first research objective, "To investigate accounting benefits perceived by accountants and internal auditors", benefits were measured using accountants' and internal auditors' responses to those ERP benefits. The Likert scale results indicate that the most highly rated ERP accounting benefits are organizational accounting benefits, operational accounting benefits in terms of time, managerial accounting benefits, and IT accounting benefits since the respondents gave each of these benefits a mean score between "5 and 6" (see Table 5). In contrast, the "Operating accounting benefits in terms of cost" mean value is 2.93, which indicates

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

the lowest rating compared to other benefits. It suggests that the reduction of costs by reducing personnel in the accounting department cannot be considered as an ERP benefit.

Table 5. Descriptive analysis of ERP accounting benefits

ERP benefit code	No. of response	Mean	Std. deviation	Degree of acceptance
OAB01	56	5.71	.889	Very high degree
OAB02	56	5.73	.842	Very high degree
OAB03	56	5.64	.862	Very high degree
OAB04	56	5.61	.888	Very high degree
OAB05	56	5.61	.867	Very high degree
OAT01	56	5.18	.897	High degree
OAT02	56	5.29	.909	High degree
OAT03	56	5.16	.949	High degree
OAT04	56	5.55	.971	Very high degree
OAC01	56	2.93	.892	Very low degree
MAB01	56	5.55	1.190	High degree
MAB02	56	5.57	1.158	Very high degree
MAB03	56	5.52	1.279	High degree
IAB01	56	5.84	.848	Very high degree
IAB02	56	5.89	.824	Very high degree
IAB03	56	5.89	.846	Very high degree
IAB04	56	5.84	.848	Very high degree
IAB05	56	5.88	.833	Very high degree

Note: Refer Appendix B for Benefit codes

Under the second research objective, " To measure the interaction of ERP accounting benefits with the accountants' and internal auditors' satisfaction level ", five hypotheses were developed. In this regard, a multiple regression analysis was used to evaluate these hypotheses. Regression results indicate 79.1% of the explanatory power (Adjusted $R^2=0.791$) of the independent variables on ERP user satisfaction. The F-statistic, which indicates the model's overall validity, is 0.000. Therefore, the model is valid in overall at the 0.05 level of significance. This regression model employed five independent and three control variables on the dependent variable of ERP user satisfaction. Regression results are presented in Table 6.

Table 6. Regression results

Variable	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
Constant	.259	.116		2.236	.030
Organizational accounting benefits	.588	.164	.592	3.583	.001
IT accounting benefits	.400	.179	.383	2.230	.042
Operational accounting benefit (Cost)	-.378	.179	-.430	-2.114	.062
Operational accounting benefit (Time)	.177	.085	.376	2.070	.044
ERP cost	.029	.050	.038	.579	.566
Type of ERP modules	-.012	.043	-.018	-.270	.788
Number of ERP modules	-.067	.040	-.109	-1.681	.099

Note: Dependent variable is ERP user satisfaction

According to the regression results, organizational accounting benefits of ERP systems have a positive impact on ERP user satisfaction. As the results of the regression output indicate a positive impact with a coefficient of 0.592 and a probability value of 0.001, H₁ is supported. IT accounting benefits of ERP systems also show a significant positive effect on ERP user satisfaction, with a coefficient of 0.383 and a probability value of 0.042. Hence, the results support H₃. However, operational accounting benefits (cost) show a negative coefficient of -0.430 with a probability value of 0.062, which is insignificant at the 0.05 level. Therefore, H₄ is not supported. Hence, it can be concluded that operational accounting benefits (cost) of ERP systems do not significantly impact ERP user satisfaction. It means the ERP users, such as accountants and internal auditors, do not recognize the reduction of operational expenses as a benefit of implementing an ERP system. This group of benefits is mainly examined by the indicator of "personnel reduction due to this ERP system implementation in the accounting department." The following independent variable in the table is operational accounting benefits (Time) of ERP systems, which positively impacts ERP user satisfaction with a coefficient of 0.376 and a probability value of 0.044. Thus, H₅ is supported. Table 7 presents the summary of the results.

Table 7. Summary of the results

Hypothesis	Coefficient	P-value	Status
H₁: Organizational accounting benefits have a positive impact on ERP user satisfaction.	.592	.001	Supported
H₃: IT accounting benefits have a positive impact on ERP user satisfaction.	.383	.042	Supported
H₄: Operational accounting benefits in terms of cost have a positive impact on ERP user satisfaction.	-.430	.062	Not supported

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

Hypothesis	Coefficient	P-value	Status
H ₅ : Operational accounting benefits in terms of time have positive impact on ERP user satisfaction.	.376	.044	Supported

5. Discussions and conclusions

5.1 Discussion of findings

The first objective of this study is to investigate accounting benefits perceived by accountants and internal auditors in Sri Lanka. In this regard, the strength of perceived five types of ERP accounting benefits were tested. Out of these five benefits, Organizational accounting benefits, IT accounting benefits, Management accounting benefits, and Operational accounting benefits in terms of time are highly rated by the respondents whereas Operational accounting benefits in terms of cost received a lower rating compared to others. These results are congruent with the studies conducted by Colmenares (2009), Kanellou and Spathis (2013), Malinic and Todorovic (2012), Nwankpa (2015), and Spathis (2006).

Before conducting the regression analysis, using an independent sample T-test, this study further analyzed whether there is a perspective difference between accountants and internal auditors regarding the ERP accounting benefits and user satisfaction. Based on the T-test results, no such statistically significant difference was identified between the perceptions of internal auditors and accountants regarding the ERP accounting benefits. These results are consistent with the findings of Kanellou and Spathis (2013) and Ifinedo and Nahar (2007), who also found the same results among the perceptions of different ERP users. However, they have considered the perceptions between managers, IT professionals, and accountants but not accountants and internal auditors.

As per the second objective, this study examined the impact of accounting benefits on ERP user's satisfaction level from the accountants' and internal auditors' standpoint. The regression results indicate that organizational accounting benefits, IT accounting benefits, and operational accounting benefits (time), have a significant positive influence on ERP user satisfaction. These results are consistent with the findings of Saaticioglu (2009) and Kanellou and Spathis (2013), and Weli (2018), who also found the same results. In contrast, operational accounting benefits (cost) do not significantly influence ERP user satisfaction which also received a lower rating in terms of ERP benefits perceived by accountants and internal auditors. These same insignificant results were found by Kanellou and Spathis (2013) in their study. Accordingly, reducing personnel with ERP implementation and saving considerable costs do not significantly affect the degree of ERP user satisfaction. As a possible reason, Granlund and Malmi (2002) indicate that, although accountants can save time

after ERP implementation, they might utilize saved time in analyzing data and preparing reports as a new role for existing employees rather than cutting employees as a result of decreasing routine activities with the ERP systems adoption. Beyond such accounting discipline, Dussault and Dubois (2003) suggest that some organizational HR policies also make it difficult for them to reduce personnel in an organization. Therefore, these would be possible reasons not to show statistically significant results of operational accounting benefits (cost) on ERP users' satisfaction in Sri Lanka as well.

The findings regarding the organizational accounting benefits of ERP systems and their positive impact on user satisfaction agree with the results of Colmenares (2009), Kulathunga and Fernando (2019), and Nwankpa (2015). Such results confirm that implementation of the ERP systems mainly improves the organizational decision-making process, coordination across the different departments, and internal communication. The positive effect of operational accounting benefits (Time) on ERP user satisfaction found by the current study is congruent with Velcu (2007) and Brazel and Dang (2008), who initially found that ERP systems eliminate the reporting lags and service time in accounting tasks. In the Sri Lankan context, this is similar to the findings made by Kulathunga and Fernando (2019). They revealed that users are significantly satisfied in terms of the timeliness of the ERP system. Thus, the present study also confirms that ERP solutions reduce the time for the closure of monthly, quarterly, and annual accounts and the time for issuing financial statements. Moreover, the findings regarding the IT accounting benefits of the present study agree with Spathis and Constantinides (2004) and Elmonem *et al.* (2016), who also reveal the same results as ERP systems gather and process data easier and quicker. Hence, organizations can reduce the time for transaction processing with the assistance of an ERP system.

In conclusion, ERP users such as accountants and internal auditors in Sri Lanka could obtain a greater degree of accounting benefits by implementing ERP systems, and respondents highly rate a majority of these benefits. Therefore, ERP user satisfaction is positively influenced by ERP accounting benefits, and ERP systems are worthwhile for accountants and internal auditors in Sri Lanka.

5.2 Contribution of the study

According to past studies, it is vital to study the performance of ERP systems and their user satisfaction at different levels of stakeholders within the organization. In this regard, this study has examined the ERP accounting benefits and user satisfaction from the perspective of accountants and internal auditors who closely work with ERP systems. Therefore, accountants and internal auditors can better understand the accounting benefits of implementing ERP systems. Moreover, ERP consultants can use these findings to provide better guidance for the firms that decide to adopt an

accounting model into the ERP systems. In addition, these findings are valuable to ERP providers who take actions in developing accounting features to uplift ERP user satisfaction.

On the other hand, the results of the present study are valuable to any Sri Lankan firm which is considering to implement an ERP system with accounting techniques because Koh *et al.* (2006), Sheu *et al.* (2004), and Charmis (2018) reveal that, there are many differences between ERP performances in different contexts as their culture, government regulations, infrastructure, management style, and labor skills highly influence on ERP systems implementation. As a developing country, there is a huge trend currently prevailing in Sri Lanka that companies shift from conventional IS to ERP systems (Haleem *et al.*, 2019). Therefore, these findings are valuable to any Sri Lankan company interested in adopting an ERP system.

5.3 Limitations and directions for future research

There are inherent limitations pertaining to different aspects of the present study. The total number of responders that participated in the survey was limited to 56 (38 accountants and 18 internal auditors) because it is difficult to identify all the companies that are implementing ERP systems in Sri Lanka due to the unavailability of specific information sources as to who implements such systems. As a direction for future research, a large sample could be used in order to get more reliable and generalizable results. Furthermore, researchers can examine more accounting benefits derived from ERP systems and their influence on end-user satisfaction beyond the accounting benefits mentioned in the present study. Moreover, future qualitative research can be conducted to discover the quality of the accounting information derived from the ERP systems, which cannot be addressed using the quantitative methodology used in the present study. Furthermore, there is an even greater need for studies in terms of recognizing the relevant accounting issues and disadvantages that may arise from implementing an ERP system because the present study has, more importantly, considered the positive side of ERP systems adoption.

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**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

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Appendix A. Operationalization

Variable	Indicator	Survey question	Reference
ERP accounting benefits	Organizational accounting benefits	Increased internal communication	Spathis (2006), Shang and Seddon (2002), Kanellou and Spathis (2013)
		Improved coordination between departments	
		Improved decisions based on timely and reliable accounting information	
		Improved decision-making process	
		Increased integration of accounting applications	
	Operational accounting benefit (Time)	Reduction of time for closure of monthly accounts	Spathis (2006), Shang and Seddon (2002), Nguyen <i>et al.</i> (2020)
		Reduction of time for closure of quarterly accounts	
		Reduction of time for closure of annual accounts	
		Reduction time for issuing financial statements	
	Operational accounting benefit (Cost)	Reduction of personnel from accounting department	Kanellou and Spathis (2013)
	Managerial accounting benefits	Increased flexibility of information generation	Spathis (2006), Shang and Seddon (2002), Kanellou and Spathis (2013)
		Improved working capital controls	
		Increased use of financial ratio analysis	
	IT accounting benefits	ERP gathers data more quickly	Spathis (2006), Shang and Seddon (2002), Kanellou and Spathis (2013), Nguyen <i>et al.</i> (2020)
		ERP gather data easier	
		ERP reduces the time for transaction processing	
ERP produces results easier			
ERP is flexible in general			
ERP user satisfaction		Are you satisfied with the information you get from the ERP system	DeLone and Mclean (2003), Doll and Torkzadeh (1988), Nelson <i>et al.</i> (2005), Lin (2010), Nguyen <i>et al.</i> (2020)
		Are you satisfied with the interaction with the ERP system	
		The ERP system has eliminated the errors or significant distractions	
		The ERP system satisfies me on the whole	

**Do accounting benefits of ERP systems impact the satisfaction of end-users?
From the perspective of accountants and internal auditors in Sri Lanka**

Appendix B. ERP accounting benefits codes

Code	ERP accounting benefits
OAB01	Increased internal communication
OAB02	Improved coordination between departments
OAB03	Improved decisions based on timely and reliable accounting information
OAB04	Improved decision-making process
OAB05	Increased integration of accounting applications
OAT01	Reduction of time for closure of monthly accounts
OAT02	Reduction of time for closure of quarterly accounts
OAT03	Reduction of time for closure of annual accounts
OAT04	Reduction time for issuing financial statements
OAC01	Reduction of personnel of accounting department
MAB01	Increased flexibility of information generation
MAB02	Improved working capital controls
MAB03	Increased use of financial ratio analysis
IAB01	ERP gathers data more quickly
IAB02	ERP gathers data easier