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# Use of ERP in Accounting, Business process integration, Accounting standards and Finance: A Literature Review

**Sandeep Jain*** Research Scholar, Department of Commerce, University of Kalyani. Email: sandeep.fineco@yahoo.com
**Sunil Kr. Gandhi**** Professor of Accounting & Finance, University of Kalyani, West Bengal. Email: sunilgandhi.ku@gmail.com

***Abstract***

Enterprise resource planning (ERP) is a process used by companies to integrate the important parts of their businesses. Enterprise Resource Planning (ERP) software are business management software that allows an organization to leverage a suite of integrated applications. ERP systems streamline and automate processes, creating a leaner, more accurate and efficient operation. ERP provides complete visibility into core business processes.

The introduction of an Enterprise Resource Planning (ERP) system in an organization brings with it changes on how users work. An ERP system cuts across the different functional units of an organization and therefore if not properly managed during its implementation may lead to resistance from the users. The different streams of research on ERP systems have mainly been on ERP adoption, success measurement, and critical success factors (CSFs). Main and only majorprocpects is the business process change management and the contribution of users towards the successful implementation of ERP systems. This paper reviews literature on ERP implementation with an aim of building a case for involving users in this implementation.

ERP is important in accounting and finance as it streamlines and optimizes many repetitive accounting processes. An entity can save more time and money as ERP provides valuable insights to accounting and financial analysts and assists in analyzing large amount of data fast, generating more accurate, actionable data at lower costs. This data can then be used to deliver insights and analytics, driving strategic decision making that affects the whole entity. In recent years, with the innovations in science and technology, the application of ERP technology in accounting and finance field has become more and more extensive and in-depth. The integration of ERP and accounting is both an opportunity and a challenge. This paper combs the worldwide research literatures on use of ERP in the field of accounting, assurance & finance, and points out the limitations of existing research, and provides reference for future research. Another goal is to outline ERP technologies used in audit and accounting. We surveyed research literature between 1989-2020 and review ed more than 150 research papers. As meta-analysis results show that the majority of researches illustrate a positive impact of ERP use on the accounting and finance function. Our study is divided into six sections- Introduction; Objectives of the Study; Conceptual Issues; Research Design; Findings; Conclusion.

*Key words: ERP, Accounting, Core business process Integration Audit, Finance.*

## 1. Introduction

John McCarthy offers the following definition in this 2004 It is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence.

ERP is important in accounting, business process and finance as it streamlines and optimizes many repetitive accounting processes. The overall outcome is that organizations can save more time and money as ERP provides valuable insights to accounting and financial analysts and assists in analyzing large amounts of data fast, generating more

accurate, actionable data at lower costs. This data can then be used to deliver insights and analytics, driving strategic decision making that affects the whole company.

The use of enterprise resource planning (ERP) software has become increasingly more common in a lot of today's businesses. It is adopted in many firms in attempts of improving business

performance. The concept of business performance can be operationalised as financial gains by the organisation, operational improvements for the organisation or intangible gains for the

organisation. The focus of this paper will be on the operational and intangible gains resulting from ERP implementation . Introduction The use of enterprise resource planning (ERP) software has become increasingly more common in a lot of today's businesses. It is adopted in many firms in attempts of improving business performance. The concept of business performance can be operationalised as financial gains by the organisation, operational improvements for the organisation or intangible gains for the organisation. The focus of this paper will be on the operational and intangible gains resulting from ERP implementation

The use of the traditional system is declined greatly and with a modernization of the accounting and finance processes there have been a great deal of change, and these improvements are beneficial to the accounting and finance industry. Adopting ERP applications such as Expert systems for audit and tax, Intelligent Agents for customer service, Machine Learning for decision making, etc. can lead a great benefit by reducing errors and increasing the efficiency of the accounting and finance processes.

In recent years, with the innovation and development of science and technology, the application of ERP technology in accounting field has become more and more extensive and in-depth. The integration of ERP and accounting is both an opportunity and a challenge. This paper combs the research literatures in the field of accounting brought by ERP, gets to know the basic situation of the research literatures, analyzes the application status, influence and coping strategies of ERP in accounting field, points out the limitations of existing research, and provides reference recommendations for the future research trend.

## 2. Objectives of the Study

The purpose of this literature review is to gain an understanding of the existing research or literature relevant to the impact of ERP on the profession of accounting and assurance. It provides a comprehensive overview of knowledge about this area of study in the form of a written report. Specifically, the study describes the impacts of ERP on accounting and assurance in the following manner; by identifying the emerging trends in these fields, by identifying the impact of ERP on the efficiency and effectiveness of these professions, and the inconsistencies and gaps in the research. The details of this study are helpful for the professionals in accounting and auditing as it enhances the readers understanding of the topic at large.

The Aim of this paper is to analyze the current situation regarding ERP in audit and accounting, business process including the newest trends, opportunities and threats and failproof the Implementation up to the specific module levels through extensively revises the literature review of ERP and its impact on accounting hat support researchers in investigating such research gaps in the near future. Due to its innovative character, this field is constantly changing, with the biggest companies investing enormous amounts of capital to achieve wide use of ERP in audit and accounting. One of the main goals of the paper is to provide an analysis of audit tasks that benefit from ERP implementation, with an emphasis on risk assessment. Another goal is to outline ERP technologies used in audit and accounting, accounting standards and to finding the reasons of implementation failure and change management challenges.

## 3. Research Methodology

The methodology employed is the panel systematic dimensions approach that aims to address research problems by critically evaluating and integrating the findings of all of the relevant prior studies. To keep ensuring a transparent and

replicable process, we have conducted a meta-analysis. The database search was between the years 2002-2020 and reviewed Approx. 15 research papers. As meta-analysis results show, the majority of researches illustrate a positive effect of the impact of ERP systems in the accounting and finance process. Moreover, it contributes to our knowledge through achieving a well established and systematic review, it also identifies relations, gaps and inconsistencies in the literature on ERP and accounting in order to offer new research gaps

- A systematic dimensions approach defined research question by collecting. Listing and summarizing all empirical evidence that fits our pre-specified eligibility criteria.
- A meta-analysis is the use of statistical methods to summarise the results of these studies. A meta-analysis is a statistical analysis that combines the results of multiple scientific studies. Meta-analyses can be performed when there are multiple scientific studies addressing the same question
- Systematic reviews, just like other research articles, can be of varying quality. They are a significant piece of work (the Centre for Reviews and Dissemination at York estimates that a team will take 9-24 months), and to be useful to other researchers and practitioners they should have:
- clearly stated objectives with pre-defined eligibility criteria for studies
- explicit, reproducible methodology
- a systematic search that attempts to identify all studies
- assessment of the validity of the findings of the included studies (e.g. risk of bias)

systematic presentation, and synthesis, of the characteristics and findings of the included studies

In our research we have collected the research papers mostly published in peer reviewed journals as per our specific requirement " Impact and use of ERP in Accounting , auditing, Assurance, Finance profession and Industry." And then we have summerised the results categorically to get a statistical result as Meta- analysis.

4. Conceptual Issues

The history of ERP goes back more than 100 years. In 1913, engineer Ford Whitman Harris developed what became known as the economic order quantity (EOQ) model, a paper-based manufacturing system for production scheduling. For decades, EOQ was the standard for manufacturing. Toolmaker Black and Decker changed the game in 1964 when it became the first company to adopt a material requirements planning (MRP) solution that combined EOQ concepts with a mainframe computer.

MRP remained the manufacturing standard until manufacturing resource planning (called MRP II) was developed in 1983. MRP II featured "modules" as a key software architectural component, and integrated core manufacturing components including purchasing, bills of materials, scheduling, and contract management. For the first time, different manufacturing tasks were integrated into a common system. MRP II also provided a compelling vision of how organizations could leverage software to share and integrate enterprise data and boost operational efficiency with better production planning, reduced inventory, and less waste (scrap). As computer technology evolved through the 1970s and 1980s, concepts similar to MRP II were developed to handle business activities beyond manufacturing, incorporating finance, customer relationship management, and human resources data. By 1990, technology analysts had a name for this new category of business management software—enterprise resource planning.

Unlike the traditional computer programs for accounting designed to give distinct instructions to the computers for collection information data with both the possibilities of certainty and uncertainty. ERP enables software applications to become more accurate by using historical data as input and predicting outcomes that are not explicitly programmed to do so (Michie et al., 1994). The fundamental categories of algorithms in ERP are supervised, unsupervised, and semi-supervised algorithms (Ayodele, 2010). These algorithms are trained to change and improve themselves, analyze anomalies, remove errors without any human intervention and mitigate the chances of occurring again. They are also used to improve processing speed, review source documents, and find similar patterns from huge or complex data (Mohammed et al., 2016).

ERP holds a significant attraction for business world in these contemporary times. The broad range of facilities that it offers and the various applications on business data that it has, allows the organizations to easily cope with the dynamic environmental conditions in diversified industrial sectors (Apte, 2010). ERP is beneficial in accomplishing complex business tasks with great accuracy instead of humans who cannot process huge quantum of data and produce accurate conclusions (Finlay, 2017). Similarly, the integration of multiple processing units results in a high processing speed and decreases the element of human biases (Canhoto & Clear, 2020).

Today, extensive research is being conducted on the impacts of ERP on the professions of accounting and assurance. Its vast application on various tasks such as assessing business risks, analyzing business transactions or activities, and reviewing source documents etc. has gotten the attention of many of the large businesses and academics (Atanasovski et al., 2020). Researchers mostly use ERP to make predictions about accounting estimates, material misstatements, bankruptcy, and fraud. It is also creating a great awareness with respect to the inductive reasoning methodology in accounting and auditing (Canhoto & Clear, 2020).

Numerous large CPA firms are still trying to find other ways in which ERP could be useful for conducting financial statement audits, especially in the risk assessment process. However, researchers believe that even though there is an immense potential for a deeper and broader understanding of ERP on audit processes, the logic or accuracy of the patterns identified by it could be questionable. Therefore, some academics are now raising the concerns of potential ethical implications and human biases of ERP in accounting/auditing research and practice.

Another major area of research that the researchers widely discuss pertains to the impact of ERP on the individuals or occupations associated with accounting and audit.Simply change management is real hard challenge in ERP implementation. It is believed that where some of the accountants/auditors would embrace the challenge of this new business environment, many would fail to adapt and will be left behind. Nonetheless, many researchers concede that the profession of accounting is on its way to make a significant change in the role and the function that it plays in the organization (Donepudi, 2019). However, where there is a substantial amount of literature that has been produced on the applications of ERP techniques to audit and accounting procedures, there is a considerable gap of studies on the potential bias and ethical implications of ERP on these topics.

General Description of the Research Literature

A. Basic Information on the Temporal Distribution of Research Literatures In this research, the author searched " ERP" and " accounting"/ audit"/ " financial management"/ " taxation" under the search item of "title" on CNKI and conducted advanced searches on “all journals” up to Aug., 2019; totally, 150 articles were collected. The specific temporal distribution is shown in "Table I":

TABLE I: Temporal Distribution of Research Literature

| Year | "ERP" and Accounting and Accounting Standards" | "ERP" and Audit | "ERP" and Business process integration | "ERP" and Taxation" |
|---|---|---|---|---|
| 2003 | 1 | | 1 | |
| 2004 | 1 | | 1 | |
| 2006 | 1 | | | |
| 2009 | 1 | | 1 | |
| 2010 | | 1 | | |
| 2012 | | 1 | | |
| 2016 | 1 | 2 | | |
| 2017 | 1 | | | |

| | | | | |
|---|---|---|---|---|
| 2018 | 2 | | 1 | |
| 2019-2021 | 1 | | | 1 |

There are also certain researches on ERP in audit and that in business process integaration, with 4 and 3 articles respectively. There are relatively few researches on ERP in taxation, with only five articles and mainly about the basic situation of applying ERP in tax management

B. Basic Information on the Publications That Published with Such Research Literatures Among the existing research literatures, only 2 articles were published in core journals, and were mERPnly published in publications such as the Finance & Accounting, the Communication of Finance and Accounting, the Finance and Accounting Monthly and the Friends of Accounting; the remained 4 articles were published in general publications. This shows that although the researches on ERP in accounting have made some breakthroughs in the quantity in recent years, the breadth and depth of the research are not enough.

C. Basic Information of the Topics of Such Research Literatures According to the contents of the existing research literatures, the current research topics about ERP in accounting field 1 are mainly concentrated in four aspects: the application of ERP in accounting field, the impact of ERP on the accounting field, the transformation from financial accounting to management accounting through ERP, and the cultivation of accounting talents in the context of ERP.

## 5. Research Design

This is kind of a review study, the purpose of which is to analyze or synthesize the research that has already been conducted based on primary sources. A review study is generally conducted to summarize the current state of research on any given topic.

A systematic and critical analysis of the literature relevant to the impacts of ERP on the profession of accounting and assurance has been done in this study. To identify relevant literature, popular articles and papers were reviewed, and bibliographies of these papers were used to find appropriate sources for further research. The literature used for this study consists of the research papers published in peer-reviewed journals; and majority of the literature studied have been published in recent years.

## 6. Findings

Literature on ERP in Accounting , Accounting standards

ERP in accounting has already made its impact by reducing the fear and workload while conducting audits, creating automated forecasts and assisting smart bots in ERP accounting. The Use of Software makes it easier to manage continuously occurring transactions by recognizing patterns.

One of the most fundamental ways in which ERP can change the financial industry is by reducing the common errors committed by a human being. Most of the regular data-entry practices and management of invoices and low-level bookkeeping tasks are now replaced by ERP. This in turn, has reduced the chance of incorrect input of accounting information and reduced the workload of accountants (Elmes et al., 2020). While some researchers have shown their concerns toward the eliminating jobs in the profession of accounting and finance, many are confident that it would free up the times of financial professionals that can be used for working on a higher-level aspect within an organization (Galarza, 2017).

With the development of society and science and technology, the application field of ERP in accounting work will be further expanded. literature, and extracted the keywords of an article and the keywords contained in the first-level title, the second-level title and the third-level title to understand the ERP that the scholars have studied to bring about accounting work. There are eight mERPn aspects of direct impact. ("Table II")

TABLE II. Statistics of Direct Impact of ERP on Accounting Work

| MERPn influence | Frequency |
|---|---|
| 1. Improved accounting (audit) work efficiency | 2 |
| 2. Improved the quality of accounting information | 2 |
| 3. Effectively prevented fraud and reduced audit risk | 1 |
| 4. Saved cost on human resources | 2 |
| 5. Enhanced the (core) competitiveness of enterprise | 1 |
| 6. Prevented and controlled the operation risks of business | 4 |
| 7. Unguaranteed accounting information security | 2 |
| 8. Reduced the demand for traditional accounting talents | 2 |

As can be seen from "Table II", items 1-6 in the table are positive aspects brought by ERP. As ERP gradually enters accounting, auditing, taxation and other work, it has played a clear role in improving the work efficiency, maintaining accurate accounting information, preventing risks and saving cost on human resources. ERP is a double-edged sword. The technological innovation brought by it brings a series of positive influence, but also brings some negative influence, such as items 7-8. In the era of big data, network information security and the "intrusion" of hackers may pose influence on the security of accounting information. It is also because ERP can efficiently process the collection, collation and analysis of data, the demand for traditional accountants is reduced undoubtedly, but ERP may not replace accountant.

ERP in Cost Accounting Estimates

Widespread use of accounting estimates can be witnessed in all the industrial sectors present in the market. Managerial estimates comprising of warranty expense estimation, asset impERPrment, useful life of asset, depreciation method, estimates of employee pension fund, employee stock options, contingent liabilities, allowances for receivables, estimating doubtful debts, tangible assets valuation and their revaluation are pervasive. Calculations for these estimates are computed while ensuring that an aligned pattern is followed in order to generate consistent values. These estimates majorly comprise of balance sheet items such as assets and liabilities and their respective heads in income statement.

These estimates are further incorporated by the auditors in preparation of company`s audit report which can further lower the reliability of company's financials. Research shows that ERP boosts performance and improved experience of managerial estimates for auditors, managers, and accountants. The fusion of A.I. along with human intelligence is a promising strategy to achieve better results for the business (Cho et al., 2020). Another research showed that in four out of five insurance lines examined, the data with regards to loss estimates, reserves and realizations produced by ERP was superior to the actual managerial estimates reported in financial statements.

This shows that accounting estimates can significantly be improved through ERP by enhancing the reliability and consistency of accounting estimates. In addition to this, ERP estimates can also be used as a benchmark to compare the estimates of the managers and auditors. If the deviation from the ERP estimates is significant than managers' estimates must be reexamined. Other implications and further research on this area is also required to improve the financial information.

Literature on ERP in Finance

Technological progression in these times has changed the way finance has been handled. It has made significant progress by reducing costs, enhancing customers' experience and increasing revenue by saving numerous organizations from potential losses and taking corrective actions whenever needed. ERP is now further evolving into deep learning, thus, increasing the quality of information and saving costs (Dixon et al., 2020).

Nowadays, numerous operations of finance heavily rely on ERP for running technical software. It offers a wide range of benefits to the companies including risk identification, risk assessment, credit worthiness of the client, credit history, financial footing etc. Similarly, bank reconciliation processes have been automated with the emergence of A.I. as past trends of transaction allocations are used to classify the new ones

The use of ERP also increased the security aspect of financial data. The financial monitoring and data network security has improved due to the use of ERP algorithms that assists in keeping the data secrecy and sustain confidentiality (Kumar V., Maheshwari B., Kumar U., 2002).

It has been observed that while manipulating the past data as an input for future projection, the ERP algorithms not only identify and recognize new patterns, but they also reveal the past unknown relationships between various elements within the data set provided. This assists in forecasting potential errors, rectifying them, and preventing them from occurring again, hence, increasing the reliability of financial forecasts (Raminder Pal Singh, Sangeeta Arora., 2016). Resultantly, the businesses decisions made based on the output provided by ERP becomes more reliable and accurate. In short, incorporation of ERP improves and expands the landscape of forecasting and productive analysis.

## 7. Conclusion

Even though the concept of ERP has been developed since 1914, most of the research about impact of ERP in areas of accounting and assurance has been initiated in the 20 years. The theoretical analysis of ERP and its impact on accounting and business process integration finance, audit has revealed that this technology has potential to unearth the numerous benefits. However, the vast application of ERP on various business tasks such as assessing risks, analyzing transactions, activities, and reviewing source documents etc. has just received the attention of many academics and practitioners.

However, with the development of ERP technology, further researches are needed as for how much the accounting work can be developed by ERP, and what is the future accounting positions and accounting functions will be. The development of ERP drives the reconstruction of accounting discipline. Accounting discipline must be integrated with other disciplines to cultivate composite accounting talents. The researchers have also questioned the integrity of data fed to the ERP algorithm, as biased and fraudulent data input would result in the inaccurate and ineffective outcome. And why some modules such as HR, Plant maintenance, Project accounting, IFRS Implementation are still not working properly with ERP,

The challenges of increased knowledge requirement for accounts and audit professionals as well as requirement of unbiased input data would limit the scope of ERP for some time. In short, the ERP's ability to safely predict, identify and rectify the data can have many implications on the financial and audit profession, hence, researchers should be encouraged to further investigate the future uses and challenges of implementation of full integrated ERP technology.

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