

Analysis and Design of an Effective E-Accounting Information System (EEAIS)

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Abstract. E-Accounting (Electronic Accounting) is a new information technology terminology based on the changing role of accountants, where advances in technology have relegated the mechanical aspects of accounting to computer networks. The new accountants are concerned about the implications of these numbers and their effects on the decision-making process. This research aims to perform the accounting functions as software intelligent agents^[1] and integrating the accounting standards effectively as web application, so the main objective of this research paper is to provide an effective, consistent, customized and workable solution to companies that participate with the suggested OLAP accounting analysis and services. This paper will point out a guide line to analysis and design the suggested Effective Electronic-Accounting Information System (EEAIS) which provide a reliable, cost efficient and a very personal quick and accurate service to clients in secure environment with the highest level of professionalism, efficiency and technology.

Keywords: E-accounting, web application technology, OLAP.

1 Systematic Methodology

This research work developed a systematic methodology that uses Wetherbeis PIECES framework [2] (Performance, Information, Economics, Control, Efficiency and Security) to drive and support the analysis, which is a checklist for identifying problems with an existing information system. In support to the framework, advantages & disadvantages of e-Accounting compared to traditional accounting system summarized in *Table 1*.

The suggested system analysis methodology emphasizes to point out a guide lines (not framework) to build an effective E-Accounting system, Fig -1 illustrates EEAIS required characteristics of analysis guide lines, and the PIECES framework is implemented to measure the effectiveness of the system. The survey which includes [6] questions concerning PIECES framework (Performance, Information, Economics, Control, Efficiency, Security) about adoption of e-accounting in Bahrain have been conducted as a tool to measure the suggested system effectiveness. A Questionnaire has been conducted asking a group of 50 accountants about their opinion in order to indicate the factors that may affect the adoption of e-Accounting systems in organizations in Bahrain given in *Table 2*.

2 Analysis of Required Online Characteristics of (EEAIS)

Main features of suggested e- accounting information system (EEAIS) are the following:

- Security and data protection are the methods and procedures used to authorize transactions, Safeguard and control assets [9].
- Comparability means that the system works smoothly with operations, personnel, and the organizational structure.
- Flexibility relates to the system's ability to accommodate changes in the organization.
- A cost/benefit relationship indicates that the cost of controls do not exceed their value to the organization compared to traditional accounting.

First step of EEAIS analysis is to fulfill required characteristics; some of these measures summarized in *Figure -1*, which should be implemented to ensure effective and efficient system.

3 Infrastructure Analysis

The EEAIS on line web site's infrastructure contains many specific components to be the index to the health of the infrastructure. A good starting point should include the operating system, server, network hardware, and application software. For each specific component, identify a set of detailed components [3]. For the operating system, this should include detailed components like CPU utilization, file systems, paging space, memory utilization, etc. These detailed components will become the focus of the monitors that will be used for ensure the availability of the infrastructure. *Figure -2* describes infrastructure components and flow diagram indicating operation steps. The application & business issues also will be included. Computerized accounting systems are organized by modules. These modules are separate but integrated units. A sales transaction entry will update two modules: Accounts Receivable/Sales and Inventory/Cost of Goods Sold. EEAIS is organized by function or task, usually have a choice of processing options on a "menu." will be discussed in design issue.

These issues are EEAIS characteristics (Security, Comparability, and Flexibility and Cost/Benefits relationship) used to clearly identify main features. Survey about adoption of e-accounting in Bahrain have been conducted to measure suggested system effectiveness and efficiency which includes important questions concerning PIECES, Performance, Information, Economics, Control, Efficiency, Security. A Questionnaire has been conducted asking a group of 50 accountants about their view regarding the adoption of e-Accounting systems in organizations in Bahrain given in *Table 2*. The infrastructure server, network hardware, and used tools (menu driven) that are the focus of the various system activities of e-accounting (application software) also included in the questionnaire to support analysis issue.

Table 1. E-Accounting compared to Traditional Accounting

E-Accounting	Traditional Accounting
1-Time & location flexibility 2-Cost-effective for clients. 3-Global with unlimited access to shared information 4-Self- paced	1 Time & location constraints 2- More expensive to deliver. 3-Local with limited accessed to shared information 4- Not Self-Paced, accountant –centered
5-Lack of Immediate feed-back in asynchronous e-accounting. 6-Non comfortable, anxiety, frustration and confusion to some clients. 7-Increased preparation time due to application software and Network requirement.	5-Motivating clients due to interaction & feedback with real accountant 6-Familiar to both individual & company due to cultivation of a social community. 7- Less preparation time needed.

Table 2. PIECES, Performance, Information, Economics, Control, Efficiency, Security. Questionnaire about adoption of e-accounting in Bahrain

	Questions	YES	NO	Possibly/ Don't Know
P	Do you think that EEAIS implemented automated software intelligent agent standards will improve and maintain high performance accounting systems to ensure consistency, completeness and quality, reinforces and enhance services in your organization.	68%	23%	9%
I	Do you think that EEAIS will enable an excellent information communication between clients & your company?	70%	20%	10%
E	Do you think it is Cost-effective for clients to utilized on line EEAIS?	48%	30%	22%
C	Is EEAIS lack of accuracies, interaction and feedback in online materials? Lack of client opportunity to ask accountant questions directly?	57%	23%	20%
E	Are there chances to improve the organization efficiency's in the absence of specific problems (Time, location constraints, slow response and eliminating paper works)?	74%	16%	10%
S	Is it more secure to adapt traditional accounting approach rather than e-accounting due to on line intruders?	45%	34%	21%

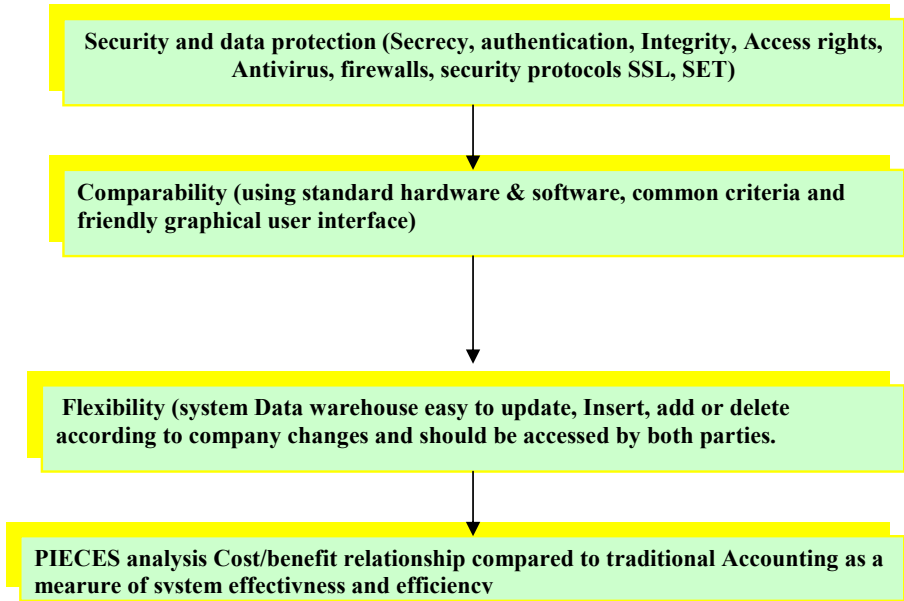


Fig. 1. Illustrates EEAIS required Analysis characteristics guide line

Figure-2 shows a briefing of the Infrastructure for suggested Efficient Electronic-Accounting Information System related to design issue, while *Figure-3* illustrates Design of OLAP Menu-Driven for EEAIS related to data warehouse as an application issue of E-accounting, the conclusions given in *Figure 4* which is the outcome of the survey (PIECES framework). There will be a future work will be conducted to design a conceptual frame work and to implement a benchmark work comparing suggested system with other related works to enhance EEAIS.

4 Application Issue

To understand how both computerized and manual accounting systems work [4], following includes important accounting services as OLAP workstation, of course these services to be included in EEAIS:

- Tax and Business Advisory (Individual and Company)
- Payroll Services
- Invoice Solutions
- Business Start up Service
- Accounts Receivables Outsourcing
- Information Systems and Risk Management analysis.
- Financial Forecast and Projections analysis.
- Cash Flow and Budgeting Analysis
- Sales Tax Services
- Bookkeeping Service
- Financial Statements

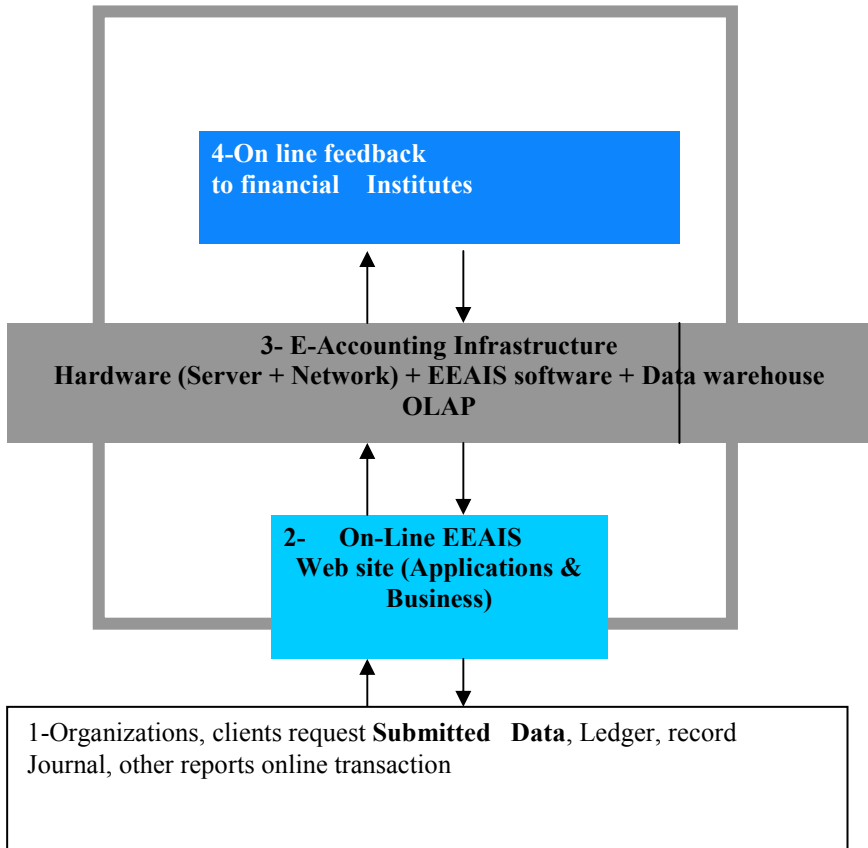


Fig . 2. Infrastructure of Efficient Electronic-Accounting Information System

5 Design Issues

The following will include suggested technical menu-driven software as intelligent Agents and data warehouse tools to be implemented in designed EEAIS.

- Design of the e-accounting system begins with the chart of accounts. The chart of accounts lists all accounts and their account number in the ledger.
- The designed software will account for all purchases of inventory, supplies, services, and other assets on account.
- Additional columns are provided in data base to enter other account descriptions and amounts.
- At month end, foot and cross foot the journal and post to the general ledger.
- At the end of the accounting period, where the total debits and credits of account balances in the general ledger should be equal.

- The control account balances are equal to the sum of the appropriate subsidiary ledger accounts.
- A general journal records sales returns and allowances and purchase returns in the company.
- A *credit memorandum* is the document issued by the seller for a credit to a customer's Accounts Receivable.
- A *debit memorandum* is the business document that states that the buyer no longer owes the seller for the amount of the returned purchases.
- Most payments are by check or credit card recorded in the cash disbursements journal.
- The cash disbursements journal have following columns in EEAIS 's data warehouse
 - Check or credit card register
 - Cash payments journal
 - Date
 - Check or credit card number
 - Payee
 - Cash amount (credit)
 - Accounts payable (debit).
 - Description and amount of other debits and credits.
- Special journals save much time in recording repetitive transactions and, posting to the ledger.
- However, some transactions do not fit into any of the special journals.
- The buyer debits the Accounts Payable to the seller and credits Inventory.
- Cash receipts amounts affecting subsidiary ledger accounts are posted daily to keep customer balances up to date [10]. A subsidiary ledger is often used to provide details on individual balances of customers (accounts receivable) and suppliers (accounts payable).

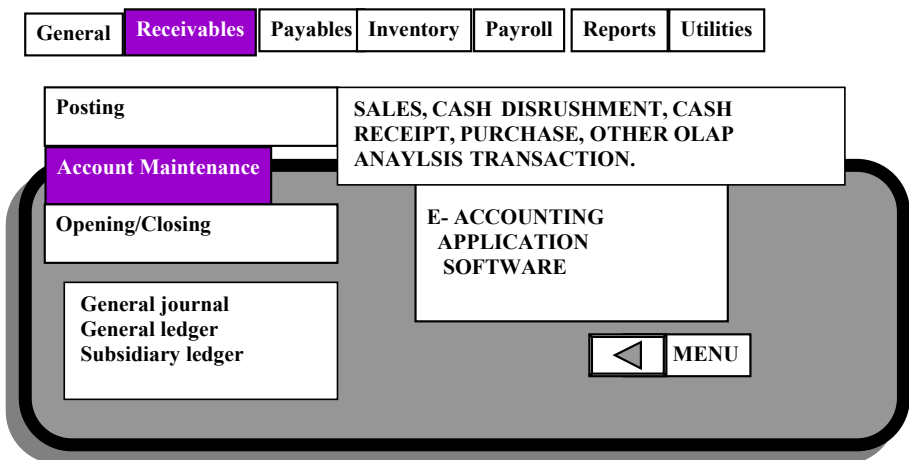


Fig. 3. Design of OLAP Menu-Driven for EEAIS related to data warehouse

6 Summary

This paper described a guide line to design and analysis an efficient, consistent, customized and workable solution to companies that participate with the suggested on line accounting services. The designed EEAIS provides a reliable, cost efficient and a very personal quick and accurate service to clients in secure environment. Questionnaire has been conducted to study and analysis an existing e-accounting systems requirements in order to find a priorities for improvement in suggested EEAIS.

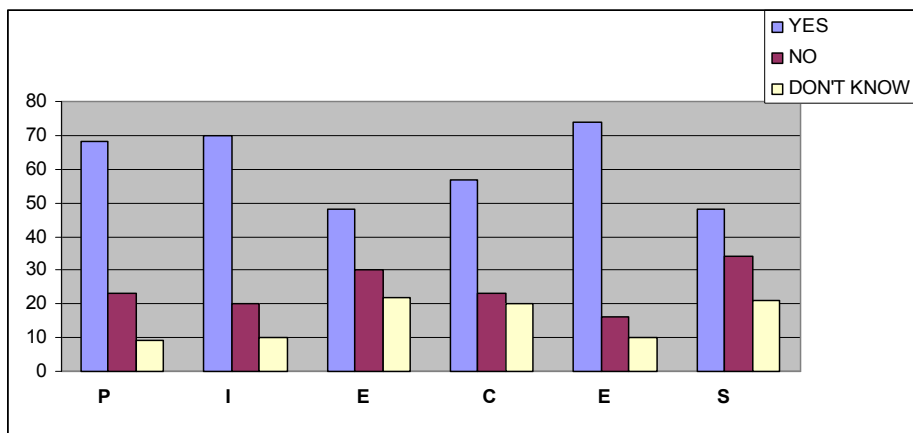


Fig. 4. PIECES Analysis outcomes

The outcomes of the PIECES survey shown in *Figure 4* indicate that more than 60% of accountants agree with the effectiveness of implementing EEAIS. The methodology is used for proactive planning which involves three steps: preplanning, analysis, and review process. *Figure -2* illustrates the infrastructure of EEAIS which is used to support the design associated with the methodology. The developed systematic methodology uses a series of issues to drive and support EEAIS design. These issues are used to clearly focus on the used tools of the system activities, so system perspective has a focus on hardware and software grouped by infrastructure, application, and business components. The support perspective is centered on design issue & suggested by menu driven given in *Figure-3* is based on Design of OLAP Menu-Driven for EEAIS related to data warehouse perspectives that incorporate tools. There will be a future work will be conducted to design and study a conceptual frame and to implement a benchmark work comparing suggested system with other related works to enhance EEAIS.

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