The impact of e-commerce on the accounting profession

"Practitioners need to stay abreast of the changes in the market. They cannot afford to be uninformed as to what is happening in the e-business revolution. Practitioners must understand the overall issues of doing business on the Internet to begin to provide value to clients in this environment."

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Intense business competition, evolving technology, changes in the business environment, and pressure from customers and suppliers are driving companies to overhaul the way they have been doing business and raising interest in electronic commerce.

The electronic commerce technologies are rapidly changing the business culture, including the rules and conditions under which business is transacted. Consequently, auditors and accountants must be cognizant of how technology affects businesses, industries, the legal and regulatory environment, and mostly the accounting profession.

Electronic commerce is simply defined as the process of doing business electronically. There is a need to use electronic transmission mediums to engage in the exchange, including buying and selling, of products and services requiring transportation, either physically or digitally, from location to location. It encompasses automating various business-to-business and business-to-consumer transactions through sound and safe connections.

At present, many types of electronic transactions and a volume of business are conducted electronically. Businesses around the world are increasingly enjoying electronic commerce and sufficient technology for reliable electronic transactions. This already includes retail consumers that use the technology for electronic shopping. This also involves a broad range of banking and financial transactions, and expanding network services, such as the Internet.

As businesses move toward paperless systems and electronic commerce, the number and types of electronic transactions and documents are expected to explode dramatically. However, electronic transactions and documents can be easily altered, deleted, and duplicated. This attribute may cause the integrity of electronic transactions and documents to be later questioned, causing disputes regarding the terms of a transaction, such as a purchase, or the content of a document, such as a contract. However, keeping up with these changes creates a meaningful challenge for the accounting profession.

The start of electronic commerce impacts the core elements of accounting and auditing – the practices, techniques, skill and knowledge requirements, liabilities as well as services offered.

Previously, traditional control models focus mainly on internal controls and processes for assuring its effectiveness. With electronic commerce, the control model drives the world and assurance processes range from internal systems and network administration to reliance on a trust model of second and third parties that may be unknown to the firm (Marcella, 1998). Furthermore, the quantity of transactions and its equivalent financial value are assumed to be of large proportions. Thus the accountants and auditors are challenged to find new and different means of making assurance possible.

Objectives

The objectives of this paper are:
1. to identify new service opportunities for the accounting profession;
2. to determine the competitive advantages of CPAs
3. to determine the necessary skills needed by the CPA;
4. to examine the risks involved in various electronic commerce activities;
5. to know the possibility of non-traditional payment
schemes for CPAs.

6. to identify the general competency requirements for the new assurance services

The Need for Assurance Services

The accounting profession has to reinvent itself to meet the needs of the new wired society (Edwards, 1999). The accountants cannot rest on their laurels while the electronic commerce revolution is going on. There is a need to identify the key skills, knowledge and training that is required of an accountant to be competitive in an electronic business world. The accountant of the future may become the key business advisor to the new world of business, most especially in the electronic world.

This implies new markets for CPAs to provide assurance and other services related to electronic commerce. Businesses employing electronic commerce will not only require assurance that their own systems are secure, but also that appropriate controls exist in supplier and customer organizations to limit access to authorized users and to protect an organization’s confidential information. Moreover, the broad use of electronic commerce introduces the need for new privacy controls.

The American Institute of Certified Public Accountants (AICPA) has defined assurance services as “independent professional services that improve the quality of information, or its context for decision makers”. This definition of assurance services captures various concepts: (1) decision making which requires quality information either financial or non-financial (2) improvement of quality in order to have confidence in the information’s reliability and relevance, and (3) independence with regards to the quality or context of information. In other words, assurance services can capture information improvement, its quality, and enhance its usefulness for decision makers.

CPAs can supply a valuable service by helping to address the risks and promoting the integrity and security of electronic transactions, electronic documents, and the supporting systems.

The CPAs that provide assurance to electronic commerce must ensure that the tools and systems in use are functioning in accordance with accepted criteria for electronic commerce integrity and security.

**Integrity services** provide assurance that the:
- components of a transaction or document as are agreed among the parties and
- systems that process and pile up transactions and documents do not alter those components.

**Security services** provide assurance that the:
- participants to transactions and documents are valid and that such transactions and documents are protected from illicit disclosure and systems that support transaction processing and storage provide appropriate validation and security.

Opportunities for CPAs

One of the distinguishing characteristics of electronic commerce is ambiguity, which can be considered as an opportunity and a problem. Many on-line buyers and sellers may be reluctant to engage in on-line transactions. On the other hand, this becomes an opportunity for CPAs to use their reputation and trust to provide assurances to both parties on the security of on-line transactions.

CPAs are in the inimitable position of having the public trust and the skill set to provide assurances on the safety and security of on-line systems. The ability of the CPA to provide the public with independent assurance on financial information can be applied to on-line transactions. CPAs have been regarded as independent, objective third parties who make honest judgments and appraisals of certain business tasks, not to mention the opinion given on the accuracy of the financial statements.

In order to provide assurance over information systems, accountants need thorough understanding of the systems. They have the opportunity to help their clients in the development and control of agents that are used in its electronic commerce applications. The CPA could become a provider of the following electronic commerce services:

- **The Value-Added Network Service Provider.** In this type of service, the CPA does the review, evaluation and testing of the control, integrity and security pro-
cedures of electronic transactions using high-integrity systems.

The Internet Electronic Commerce Software Package. The CPA renders the services by reviewing, evaluating, and testing the control, integrity and security procedures integrated into a software package employed for electronic commerce and provides assurance to third parties concerning compliance with proper criteria.

The Trusted Key and Signature Provider. It is important to develop and store authentic digital signature on electronic transactions and documents. The CPA could provide assurance that the "trusted provider" abides by proper procedures in establishing the identity of key holders and that there is an appropriate systems on which to maintain and distribute such keys.

The Digital Bank Electronic Payment Card. Several forms of digital electronic payment systems are being developed. The CPA could provide assurance to the issuers of such cards that they cannot be tampered with and to the users of such cards that the electronic payment systems and transactions are protected.

Competitive Advantage

As the technology becomes more sophisticated, it is expected that accountants will compete with technology specialists. They are not CPAs/assurers who provide services on systems, but systems specialists who provide an assurance service.

However, electronic commerce provides new opportunities for both the accounting profession and other technology professionals. The accountants as compared to other Information Technology professionals can:

- Incorporate e-commerce technology skills in performing traditional assurance services;
- Perform additional assurance services and other web-related assurances;
- Provide e-commerce business solutions to assist firms compete in international markets.

Since accountants compete with other technology professionals, the accountants, according to Robert Elliot, should have three competitive advantages:

- Their access to client personnel and the relationship that already exists with the client;
- Their reputation for independence and objectivity;
- Their familiarity with controls integrated in financial reporting systems.

CPAs may have a head start on other possible contenders because of their knowledge of internal controls in assessing the company's financial statements. The competencies needed for control assessment relative to financial statements are very similar to integrity and security control assurance service in an electronic environment. Maybe some of the CPAs lack the computer literacy and related equipment necessary to perform these services but most non-CPA competitors lack the former's knowledge of internal controls and assessment techniques.

Technological Skills

Knowing the basic programs and digital methods used to create the transaction is the only method that can be adopted to trace an electronic transaction. Audit techniques that employ periodic testing and sampling may not be applicable for electronic payment systems. This may result in too long interval to detect unauthorized transactions. The longer the interval the more fraud or erroneous processing may occur.

The members of the accounting profession should have new technical skills in order to compete in the digital economy. The AICPA recognized the need for members of the profession to considerably increase their technology skills. Specific skills-set is required to compete as an independent assurance body in an electronic commerce environment, including an in-depth understanding of the risks related to:

Intentional attacks - Hackers and/or competitors may actively attack a system to obtain access to confidential data, impersonate legitimate customers, steal and resell proprietary information, intentionally corrupt information, set-up "back doors" for future passive surveillance of transaction activity, or similar acts.

Transmission failures - As transactions travel through a network, they generally are subject to numerous processing steps, translations, and store-and-forward processes. These activities introduce risks such as unintentional errors, lost transactions, and duplication of transactions.

Lack of authentication - A fundamental requirement of all commerce (electronic and otherwise) is knowing with whom one is dealing. Electronic messages lack the traditional identifiers and increase the risk that may unintentionally deal with the wrong party, or deal with someone impersonating another party. The use of public networks heightens this risk substantially.

Loss of trust - The authentication risks may be mitigated through the use of digital signatures and other encryption technology. These technologies often require services of a trusted individual or trusted system to verify that keys and digital signatures actually belong to a designated individual.

Theft of identity - Without proper authentication techniques, it will be relatively easy for criminals to assume the identity of a party and conduct a variety of transactions in that party's name.

The study further mentioned that although most members of the accounting profession may currently lack all of the necessary technological skills, they are better positioned than their non-accounting competitors. The accountants' skills include: evaluation of evidence, planning the extent of validation to determine the effectiveness of the internal control systems; and to report the outcome of their undertaking.

CPA firms wishing to offer electronic commerce assurance services will require additional competencies. To provide this
service at a low cost, automated techniques will be needed. Firms will have to develop or acquire software agents, sensors, and other technology-based tools. Some additional skills and knowledge will include information technology and digital communications, encryption and digital-signature principles, and high-volume information storage and retrieval.

Smaller practitioners may offer services to their clients who are required to use one or more Electronic Data Interchange (EDI) systems to satisfy mandatory vendors or customers. Because many small practitioner clients will need to use multiple EDI systems, a single firm will not be able to provide significant assurance services to everyone in the information chain. This will have the effect of requiring special skills provided by niche players for each EDI system. EDI segments of the electronic commerce assurance market should therefore become available to any firm that is willing to develop the competencies necessary to deliver the service.

The CPA providing certain of these services will probably have to invest in hardware, network connections, and software applications. These resources will need to be highly secure and ensure high-integrity processing on a 24-hour basis. This technology infrastructure is likely to involve a high initial investment and continuing investments for maintenance and upgrades.

**Professional Fees**

CPA providers of electronic commerce assurance services may possibly arrange non-traditional payment schemes for their future services:

- CPAs might not charge the party mandating the use of an EDI or other electronic commerce system. They might be paid a fee by the software vendor/installer for each customer who agrees to use the system.
- CPA might receive a variable fee based upon the volume of transactions which ultimately pass through the system.

Transaction-based or volume based pricing, rather than the traditional fee-for-service pricing, provides an opportunity for the CPA to price assurance services in relation to the risk being assumed. As in the case of an insurance company where the risk increases with the number of policy holders and the size of policies, the risk in providing electronic commerce assurance is related to the number of third parties where assurance is provided to and the related volume of electronic commerce. CPAs could adopt pricing structures for these services that are responsive to the risks involved.

**Information Technology.**

Assurance services deal with information. Hence, the profound changes occurring in information technology will shape virtually all aspects of assurance services. Assurance services will take place in an environment of rapid change and increasing complexity.

CPAs need to invest heavily in lifelong learning in order to maintain up-to-date knowledge and skills. It also means learning how to effectively use new developments in hardware, software, communications, memory, encryption, etc., in everything CPAs do as information specialists, not only in dealing with clients, but also in dealing with each other as individuals, teams, firms, state societies, and national professional organizations.

**Specific Competency Requirements for New Assurance Services**

**Audit Curriculum.** The audit curriculum should encompass a much broader range of assurance services. Audit education also needs to include a much wider and deeper exposure to information technology, including information design reliability issues. Finally, and perhaps most significant, audit education needs to adopt a customer focus, which not only would increase the emphasis given to understanding user needs, but would also shift emphasis towards delivery of relevance enhancement services and away from the traditional emphasis on reliability enhancement.

**Continuing Professional Education (CPE).** CPE offered by national and other accounting associations can make a major contribution to improving the
profession’s competencies. A high priority should be given to assisting practitioners in smaller firms, which generally will not have the resources needed to develop comprehensive instructional materials for all of the new assurance services that small firms may offer. Assistance may involve actual course development and delivery or simply identification of currently available sources of instruction offered by other entities.

Conclusion

Many CPA firms have competencies that are naturally suited to performing electronic assurance services. However, they often have to draw on the talents of several individuals within the firm. The services would make use of expertise in internal control, business processes and management, and information technology.

Growth in new assurance services will depend less on franchise/regulation and more on market forces. CPAs need to develop their marketing skills — the ability to see clients’ latent information and assurance needs and rapidly design and deploy cost-effective services to meet those needs — in order to effectively compete for market-driven assurance services.

CPA firms wishing to offer electronic commerce assurance services may require additional competencies from the traditional accounting, audit, and tax skills. To provide this service at a low cost, automated techniques will be needed. Firms will have to develop or acquire software agents, sensors, and other technology-based tools. Some additional skills and knowledge will include information technology and digital communications, encryption and digital-signature principles, and high-volume information storage and retrieval.

There are numerous opportunities for assurance services that the profession may pursue now and in the near future. The new assurance services will require an expanded set of competencies that the profession needs to begin building today. Individuals, firms, academics, and professional organizations need to carefully evaluate the gap that exists between current competencies and those that will be needed as the profession moves into new assurance services. Ultimately, the profession’s ability to close the gap will depend on the individual practitioner’s willingness to make a commitment to an aggressive program of life-long learning.

With the proper technology training, the accounting industry can apply traditional control evaluation methodologies, to have data integrity and security controls’ effectiveness. The accounting profession must be prepared to help design reliable systems and the processes that encompass state-of-the-art technological evaluating controls, such as software agents and electronic sensors.

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Articles

Books
Accounting standards on inventories compared

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Accounting standards are considered as the ground rules in financial accounting. Ground rules are needed in accounting to provide a fair playing field among the preparers and users of financial statements. The adoption of accounting standards will serve as a guide in the preparation of financial reports. It will likewise allow the users of these reports to properly interpret the information contained therein. These standards are developed by standard setting bodies which are usually referred to as councils or boards. One of the accounting standards developed by these standard setting bodies is a standard on the valuation of inventories.

Inventories are considered to be one of the most important asset accounts of a business. In the Intermediate Accounting textbook authored by Dyckman (2001), a study involving 4 different companies was conducted. This study yielded the following information:

<table>
<thead>
<tr>
<th>Nature of Company</th>
<th>% Inventories to Current Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Products</td>
<td>33%</td>
</tr>
<tr>
<td>Apparel</td>
<td>54%</td>
</tr>
<tr>
<td>Office Supplies</td>
<td>65%</td>
</tr>
<tr>
<td>Specialty materials and</td>
<td>35%</td>
</tr>
<tr>
<td>communications</td>
<td></td>
</tr>
</tbody>
</table>

Based on this data, inventories, on the average, account for 47% of total current assets. The office supplies company even had inventories account for 65% of its current assets. At the very least, inventories accounted for 33% of its current assets. Needless to say, inventories is considered as a valuable asset account particularly in a merchandising or manufacturing business where their principal business activity revolves around their inventory.

Proper valuation of inventories, therefore, is a paramount consideration of accountants because it affects both the balance sheet and the income statement. Unsold inventory items are reflected as asset accounts while the cost of sold inventory items are shown in the income statement. Because of the materiality of the inventory amounts, due care must be exercised in the valuation of this asset account.

This paper will compare the accounting standards on inventories adopted by four countries, namely: USA, Russia, India and the Philippines.

Specifically, it will seek to answer the following questions:

- What are the accounting standards on inventories adopted by USA, Russia, India and the Philippines?
- What are the similarities and differences among the inventory standards adopted by the USA, Russia, India and the Philippines?
- What possible actions may be undertaken to refine or improve the Philippine accounting standard on inventories?

This paper will limit its comparison to the following:

1. Definition of inventory
2. Basis of initial recording
3. Cost flow assumptions
4. Year end valuation
5. Provision on inventories for a service provider
6. Disclosure requirement

Overview of inventories

Inventories are asset items held for sale in the ordinary course of business or goods that will be used or consumed in the production of goods to be sold (Kieso, 1998). Examples of inventory accounts are merchandise inventory, finished goods inventory, goods in process inventory, raw materials inventory and factory supplies inventory. The first example of inventory account is used by a merchandising business while the last four inventory accounts are used by a manufacturing business.

Kieso mentions three basic issues in inventory valuation. The first issue is concerned with the determination of the physical goods to be included in inventory. The accounting rule is that goods to which legal title has passed should be recorded as purchases of the fiscal period. The second issue deals with the determination of the costs to be included in inventory. One of the most important types in dealing with inventories concerns the amount at which the inventory should be carried in the accounts. Costs included in inventory are product costs and manufacturing costs. Product costs are those that attach to the inventory and are recorded in the inventory account. These costs are directly connected with the bringing of goods to the place of business of the buyer and converting such goods to a salable condition. Manufacturing costs include direct materials, direct labor and manufacturing overhead costs. Manufacturing overhead costs include indirect materials, indirect labor, and such items as depreciation, taxes, insurance, heat and electricity incurred in the manufacturing process. Period costs such as selling expenses and general and administrative expenses are not
considered as part of the cost of inventories.

The third issue tackles the cost flow assumption to be adopted in assigning the cost of the inventory. Focus shall be made on the different cost flow assumptions.

Cost Flow Assumptions

The four basic costing methods that may be used in valuing inventories are the following:

1. **Specific Identification** – This method calls for identifying each item sold and each item that remain in the inventory. The costs of the items sold are included in the cost of goods sold while the costs of the specific items on hand are included in the inventory. This method may be used only in instances where it is practical to separate physically the different purchases made.

2. **Average Cost** - This method prices items in the inventory on the basis of the average cost of all similar goods available during the period.

3. **First-In, First-Out (FIFO)** – This method assumes that the goods are used or sold in the order in which they are purchased. It assumes that the first goods purchased are the first used or sold. The inventory remaining therefore represents the most recent purchases while the cost of goods used or sold represent earlier purchases.

4. **Last-In, First-Out (LIFO)** – This method assumes that the cost of the total quantity sold or issued during the month will come from the most recent purchases. The cost of the remaining inventory will therefore reflect those coming from earlier purchases.

Gross profit and net income are lowest under LIFO and highest under FIFO. Somewhere in the middle would be the average cost method. LIFO results in the highest cash balance at year end because taxes are lower. These observations are true if prices are rising; the opposite results occur if prices are declining.

**Year-end valuation**

Inventories are also faced with additional issues like decline in inventory value. Irrespective of the costing method used by a company, cost adjustment may be necessary due to changing circumstances. Obsolescence, price-level changes, and damaged goods are examples of factors which may cause the value of inventory to decline. The inventory is then written down to reflect this loss. The general rule is that the historical cost principle is abandoned when the future utility of the asset is no longer as great as its original cost. This approach is also in line with the conservatism principle. That is, when doubt exists about the value of an asset, it is preferable to undervalue rather than to overvalue it.

At year-end, the cost which is established using any of the cost flow assumptions described above is then compared with an amount which reflects the true value of the inventory. The basis by which cost is compared at the end of the year may vary depending on the accounting standard. One approach is to compare cost with market value. In this case, market value is determined by getting the middle value among replacement cost, net realizable value and net realizable value less profit margin. The other approach is simply to compare the cost with net realizable value. Another approach equates market with selling price while another version equates market with replacement cost.

**Accounting standards per country**

What are the accounting standards on inventories adopted by USA, Russia, India and the Philippines? Presented below are brief descriptions of the accounting standards on inventories as adopted by the following four countries:

**USA**

Accounting Research Bulletin (ARB) No. 43 states that inventories are valued at the lower of cost or market. The cost amount is to be determined using FIFO, LIFO, weighted average or standard cost. ARB 43 explains that a departure from the cost basis of pricing the inventory is required when the utility of the goods is no longer as great as its cost. Where there is evidence that the utility of goods, in their disposal in the ordinary course of business, will be less than cost, whether due to physical deterioration, obsolescence, changes in price levels or other causes, the difference should be recognized as a loss of the current period. This is generally accomplished by stating such goods at lower level commonly designated as market. The rule of cost or market, whichever is lower, can be applied in one of three ways, namely: individual items, product groups and total inventory. ARB No. 43 does not specify any particular approach for as long as the procedure is applied consistently from one accounting period to another.

**Russia**

PricewaterhouseCoopers (1999) describes the accounting for inventories in Russia. The Ministry of Finance of Russia issued a standard, Accounting for Inventories, which was developed as part of the reform of the national accounting system. The standard defines inventories as part of assets for sale or to be consumed in the process of production or rendering of services, or for a company’s administrative purposes. Inventories include input materials or supplies necessary for production, finished goods, goods for resale, and other similar items. They also include assets traditionally defined under Russian Accounting Rules as low-value and short-term items, which according to International Accounting Standards, may be approximated by their nature as either expenses or low-valued fixed assets. Work in progress is left outside the standard’s scope.

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Philippines

Statement of Financial Accounting Standards (SFAS) No. 4 Revised 2000 issued by the Accounting Standards Council of the Philippines prescribes the accounting treatment for inventories under the historical cost system. Based on SFAS No. 4, inventories shall include assets that are held for sale in the ordinary course of business; assets that are in the process of production for such sale; or assets that are in the form of materials or supplies to be consumed in the production process or in the rendering of services. On important new provision of this SFAS is the inclusion of inventories of a service provider. In the case of a service provider, inventories will include the costs of the service for which the enterprise has not yet recognized the related revenue.

In the Philippines, inventories should be measured at the lower of cost and net realizable value. Net realizable value is defined as the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale. The costs of inventories should comprise all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition. These costs are defined as follows:

1. **Costs of Purchase** – These costs comprise the purchase price, import duties and taxes (other than those subsequently recoverable by the enterprise from the taxing authorities) and transport, handling and other costs directly attributable to the acquisition of finished goods, materials and services.

2. **Costs of Conversion** – These costs include costs directly related to the units of production such as direct labor, direct materials and an allocation of fixed and variable production overheads.

3. **Other Costs** – These costs include costs that are incurred in bringing the inventories to their present location and condition.

On the other hand, the cost of inventories of a service provider consists primarily of the labor and other costs of personnel directly engaged in providing the service, including supervisory personnel, and attributable overheads.

SFAS No. 4 specifies also the benchmark costing method. The cost of inventories that are not ordinarily interchangeable and goods or services produced and segregated for specific projects should be assigned by using specific identification of their individual costs. Otherwise, the cost of inventories should be assigned using the first-in, first-out (FIFO) or weighted average cost methods. In addition, SFAS No. 4 also allows last-in first-out (LIFO) as an alternative treatment.

For the year end valuation, SFAS No. 4 requires that valuation should be at lower of cost or net realizable value. Inventories are written down to net realizable value on an item by item basis.

The financial statements should disclose the following:

1. The accounting policies adopted in measuring inventories, including the cost method used;
2. The total carrying amount of inventories and the carrying amount in classifications appropriate to the enterprise;
3. The carrying amount of inventories carried at net realizable value;
4. The amount of any reversal of any write-down that is recognized as income in the period;
5. The circumstances or events that led to the reversal of a write-down of inventories;
6. The carrying amount of inventories pledged as security for liabilities.

**Similarities**

In comparing the inventory accounting standards of the four countries, the following points of similarities have been identified:

1. All the four countries initially record inventories at cost. None of them have abandoned the historical cost principle. The cost principle is a very convenient principle to adhere to because it is objective and it is in line with the going concern principle.
2. All the four countries perform year-end valuation of inventories. USA, Russia, India and the Philippines recognizes possible decline in the value of inventories. Inventories are therefore stated in the financial statements at realizable amounts.

**Differences**

The following points of differences have been identified:

1. Although inventories are initially valued at cost, the method used to determine the cost varies from one country to another. USA records inventories initially at cost using any of the following: LIFO, FIFO, weighted average cost method or standard cost. Russia assigns cost to inventories using any of the following: FIFO, LIFO, weighted average cost method and in specific instances, specific identification. LIFO is indicated as an alternative method.

Only two countries, India and the Philippines, specified benchmark treatments in their accounting standards.

2. The definition of inventory varies from one country to another. USA and the Philippines adopts the technical definition of inventories given in textbooks. Russia excludes work in progress and makes a distinction on low value and short term items. The latter is not included in the year end valuation. India, on the other hand, includes immovable properties and loose tools among its inventory account.

3. In the year-end valuation of inventories, the four countries adopted different ways of applying lower of cost or market. In the USA, market pertains to the designated market value which is the middle figure between, replacement cost,