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**Technological Change - A Glass Half Empty or a Glass Half Full: Discussion of  
“Meeting the Challenge of Technological Change,” and  
“Business and Auditing Impacts of New Technologies”**

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Will there still be work for auditors in the year 2016? This is the question James Sylph and Gregory Shields initially posed in their paper “Meeting the Challenge of Technological Change - A Standard Setter’s Perspective.” It is also the question addressed, albeit more implicitly, in the paper by Charles Le Grand, “Business and Auditing Impacts of New Technology.” While both papers agree that technological change will have a dramatic impact on the auditing profession over the next 20 years, their perspectives are quite different. Whereas the Sylph and Shields see technological change as “a glass half empty,” Le Grand views technological change “as a glass half full” in terms of opportunities for the auditing profession.

The difference in these views comes from how each defines auditing. Sylph and Shields take what I will call the “attestation perspective,” going back to the 1973 ASOBAC (A Statement of Basic Auditing Concepts) and its framework for conditions which create demand for auditing. Le Grand, on the other hand, takes what I will call the “assurance perspective” with an emphasis on reliability of systems and improvement in their performance. While these perspectives both describe the traditional external audit of the financial statements, different attributes of the product of the audit process are emphasized.

**Attestation versus Assurance**

The definition of auditing presented in ASOBAC, and subsequently in the majority of auditing textbooks, is as follows:

Auditing is a systematic process of objectively obtaining and evaluating evidence regarding assertions about economic actions and events to ascertain the degree of correspondence between those assertions and established criteria and communicating the results to interested users. (American Accounting Association, 1973).

ASOBAC further qualifies the definition of “auditing” by adding the restriction that “quantifiability is an attribute which subject matter must possess to be auditable.” In this view the product of the audit process is a statement about the quality of the information contained in the assertions (i.e., the information presented in the financial statements either meets or does not meet some quality criteria). Indeed, this definition characterizes quite well the external auditing of financial statements, particularly as practiced in the 1970s, as well as the activity that today we would call “attestation.”

However, the ASOBAC definition is less than satisfying when one moves from the case of the external audit of financial statements to other activities which most would regard as also properly being classified as “auditing.” One need only consider the layman’s image of the auditor as the IRS agent examining a tax return, the person introduced at the Academy Award ceremony, or the one standing by as the balls are selected during the weekly state lottery drawing, to see the limited nature of the ASOBAC definition.

In seeking a definition that would encompass not only these cases, but cases such as internal, value-for-money, management and quality auditing Schandl, in his *Theory of Auditing*, proposed the following simple definition:

Auditing is an evaluation process to establish the adherence to certain norms, resulting in an opinion or judgment. (1978, p. 4)

Schandl notes that while the underlying audit process is the same, these various cases of audit activity do differ as to their purpose. He identifies three general purposes (goals) audit activities may have:

- attention-directing,
- attestation, and
- decision (1978, pp. 81-82).

This recognition that it is the goal rather than the process that distinguishes the various cases of audit activities is important. If, like Sylph and Shields, we are attempting to assess the demand for auditing in the new high-tech environment, we must also consider that there may be a shift among the goals (for example, less demand for attestation audits and more demand for attention-directing and decision audits<sup>1</sup>).

A similar notion of the need to expand auditing from the limited attestation perspective is found in the definition of assurance developed at the 1993 AICPA's Santa Fe Audit/Assurance Conference. Assurance (the new word for "audit") is defined as the expression of a conclusion on the reliability and/or relevance of information and/or information systems (Elliott, 1994, p. 120). This definition has been further modified by the AICPA's Assurance Audit Services Committee to be:

Assurance services are independently performed services that improve the quality of information or its context for decision making. (Lea, 1996)

### **Attestation versus Assurance - What do the customers want?**

In their analysis of the demand for auditors, Sylph and Shields note that technology has changed what the users of financial information (traditionally, the users of the audited financial statements) want and need. Specifically, they argue that technology has led to an increase in the amount and kind of information that might be available for evaluation of organizational success, a shortened time-frame for decisions making by these users, and an increased difficulty in assessing the quality of the information. Such changes have lead many to conclude that the traditional financial statements and the auditor's certification of them are becoming irrelevant or, at least, rapidly diminishing in importance. However, as Sylph and Shields point out in their analysis, there is certainly no lessening of the demand for quality information. What has potentially changed, I would maintain, is the auditor's traditional role.

Technology has changed the auditor's role in two basic respects. First, the auditors (and here I am thinking primarily of the external auditors) have lost their monopoly rights as certifiers of information quality. When the annual financial statements were the primary source of information for evaluating organizations, it was only the external audit to whom one could turn. However, as improvements in information technology have lowered the cost of additional sources of information,

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<sup>1</sup> Decision audits is an ambiguous term. Schandl goes on to define it as evaluative activities to ensure that the process itself will operate with the least possibility of errors or mistakes. This might also be thought of as a "systems" audit.

people such as Robert Elliott have predicted that new players will enter the game, often blurring the distinction between information producer, certifier of information quality, and interpreter (Elliott 1994, p. 108). Already, there are certainly many non-CPA firms that provide a number of attestation services. To see the potential competition one need only consider the numerous consulting and engineering firms, as well as divisions of large publicly traded companies, which offer certification for ISO 9000 and for environmental compliance.

Second, as the advancement of information technology has led to a shortened time-frame for decision making by information users, what may be of more value to users is certification of the quality of the system producing the information rather than the certification of the information itself. In today's fast-paced world, can users wait 30 days before acting on a company's earnings numbers while the auditor goes about collecting evidence to certify the numbers' quality? Wouldn't the users' preference be for immediate assurance about the numbers as soon as the system can generate them?

Will there still be work for auditors in the year 2016? Maybe not for the traditional financial statement auditor, but for those able to audit for system reliability and for performance improvement there should be great demand. The opportunities for the latter type of audit services come through clearly in the second paper of this session which is authored by Charles Le Grand. However, as Le Grand makes clear, while these new technologies create opportunities they also require the auditor to develop new tools and skills.

### **"Oh Brave New World...."**

Le Grand takes us into a world of LANs, VANs, WANs,...AI, ES, EDI; a world of open systems, object technology, WEBs, and CD-ROM... a world of fuzzy thinking and alphabet soup. Does this brave new world need auditors? I certainly would argue that it needs good systems of internal control.

The new information technology has not solved the problem of control. One only has to consider some recent examples to see that the need for a good system of internal control is as great, or greater, in our technologically advanced world as it ever was. Consider the recent Wall Street Journal article on Exide Corp. - "Bilked of Batteries Exide Corp. Says It'll Take a Charge." (Henderson, 1996). The article begins:

Some one stole more than 112,000 car batteries from Exide Corp., one of the world's largest battery makers, and the company said it will take a pretax charge of as much as \$3.5 million to cover the loss. The situation has gotten Exide clobbered on Wall Street. Friday, Exide shares tumbled \$4.25 to a 12-month low....

This is not the type of incident that makes one in the auditing profession fear there will be no work. For the problem at Exide is not just that the batteries were gone; but that the company was unaware for some time that the batteries were missing.

A second example comes from a 1995 report by the Office of the Texas State Auditor on Texas A&M University. The State Auditor's cover letter for the report starts:

At Texas A&M University, management's override of policies and procedures, laws, and channels of communication have eroded the effectiveness of control systems designed to protect resources from misuse and safeguard assets. This breakdown in controls has contributed to poor

decision making, ineffective use of resources, weak oversight of operations, unlawful activities by some members of executive management, increased risks and liabilities associated with the System and University operations and negative publicity....Much of the responsibility for University administrative operations (personnel, purchasing, contracting, etc.) has been delegated to the departments, but management has not held them accountable for the operations.....

The report goes on to give a number of examples of control breakdowns with significant consequences (e.g., a \$120 million co-generation power plant which would be terminated prior to completion, consultant services of \$1 million being received without contracts in place, inefficiencies from duplicate data entry into administrative systems estimated to be costing the University over \$1 million per year). Again, this report is unlikely to compel one to conclude that audits with the goals of attention-direction or decisions are not needed. Internal control remains an issue.

A final example of how the need for assurance about internal control creates additional demand for audits is the area of outsourcing and third party contracting. Whether the increase we see in organizations' outsourcing of internal services is driven by the change in information technology or by other economic factors is not the issue. (Although I do believe there is an association between outsourcing and the rapidly changing information technology environment.) The issue is that such third party contracting requires a significant increase in auditing activity, both in terms of examining the system of controls designed into these arrangements and in terms of being an actual control for monitoring the performance of contracted parties.

In addition to the question of internal control, there is the issue of the actual performance of the new technologies. It is by no means clear that these new technologies significantly increase operational effectiveness and efficiency, at least, not to a point where attention-direction and decision auditing cannot add value. As evidence of this I collected some examples from the class projects completed by my management auditing class this past semester:

- The accounting system of the City of Austin was not able to report cost by programs, but was able to report it only by departments.
- In working with one Texas State agency the students found two payroll accounting systems were being kept because the new Statewide payroll system was unable to provide wage costs information by department.
- In another state agency fixed assets records in the Statewide system were found to be inaccurate (in a very small sample of 15 the error was over \$325,000).
- Another group worked in a very fast growing new company on improving a billing system with a current 20% rework rate.
- In another large organization students found a case where the purchasing clerk could initiate purchases without authorization.

Each of the above cases took place in environments that were relatively sophisticated in terms of information technology, but clearly were not in a world ready to dispense with auditors.

Nor are the above particularly isolated cases. A recent survey conducted by Deloitte & Touche of CIOs (Bodnar 1996), concerning the expected versus actual benefit of new information technology, found that often the results were disappointing. First it is clear that in many organizations the world describe by Le Grand has yet to arrive. The CIOs who responded to this survey still classified 77 percent of their mission-critical applications as legacy systems, systems that use outdated techniques and technology. Over a third reported that they were dissatisfied with the performance of these

systems. However, the new technology does not fare much better. For instance, in the case of one "new technology," client/server architecture, only 33 percent of respondents reported significant actual benefit to these tools. Fifty-seven percent of the respondents expected enhanced system quality; 32 percent actually got it. Forty-six percent expected reduced maintenance costs; only 19 percent got it. Twenty-seven percent expected better documentation; only 15 percent got it.

### **The Promise**

While the new information technologies often fail to meet expectations, there are success stories. Consider the results achieved in the retail industry by firms such as JC Penney and WalMart from their investment in information technology. In the case of one large retailer, the improvements in information technology have allowed the sales return process to be simplified by eliminating the need for segregation of duties. Now, rather than requiring the sales clerk to get approval from a manager for a return, and requiring the customer to provide documentation of the initial sale, the clerk is authorized to credit the customer's credit card account directly for the amount of the return. This increases the efficiency of such transactions as well as significantly increasing customer satisfaction. Control over these transactions is achieved through the computer continuously monitoring credits to accounts and alerting company personnel when unusual activity is encountered. Such CCM and CPAS techniques, to use the Le Grand terminology, clearly are changing the way control is achieved. Yet, as Le Grand points out, it is not clear that these advances lessen the need for auditors.

Surprisingly, the Le Grand paper does not discuss one of the most widespread changes we see taking place in information technology, the implementation SAP R/3 and other integrated systems. Thousands of companies such as Dow, Exxon, IBM, Intel, Dell and Texas Instruments are in the process of investing hundreds of millions of dollars in SAP or similar systems. SAP is a system with a high level of data integration. As data are only entered into the system once and maintained in only one data base, users have an increased responsibility to control and guarantee the integrity of the system. While this shifts the role of central accounting from data capturing to a planning and control function, it does not eliminate the need for auditors. If anything, SAP implementation seems to be increasing the need for auditors as organizations struggle with redesigning their work process to fit SAP and to build in appropriate controls.

### **The New Auditor**

I agree with Le Grand that a new type of auditor will be needed for this brave new world that advancement in information technology is creating. Clearly this auditor will need a much greater understanding of information technology than in the past. An idea of what skills this new auditor need possess can be found in the IIA's "Model Curriculum of Information Systems Auditing," discussed by Le Grand, or the recent guidelines issued by the Education Committee of the International Federation of Accountants (IFAC) - "Information Technology in the Accounting Curriculum." In the IFAC model information technology becomes one of the core competencies of professional accountants. The accountant is viewed as a user, manager, designer and evaluator of information systems. Even a cursory review of the suggested knowledge and skills that the new auditor should acquire in his or her formal education and on-the-job-training reveals a radical change from what one finds in today's graduates of accounting programs or successful CPA exam candidate. Whether these new auditors will be the products of today's academic accounting departments is probably much more in doubt than the existence of work for auditors twenty years from now.

## **Conclusion**

Changes in information technology have decreased, and will continue to decrease, the significance of traditional financial statements and their audits as Sylph and Shields compellingly argue in their paper. In addition these changes in technology have a significant impact on internal control - changing the risks, increasing the importance of internal control and requiring new mechanisms to achieve control objectives. Will there still be work for auditors in the year 2016? Yes, more than enough, provided that there are changes in auditing standards to allow external auditors to provide assurance on "reliability of systems," and that there is a different educational curriculum for the auditor of 2016 whether they be internal or external.

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