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Implementation of Computer Assisted Audit Techniques in Application Controls Testing

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Summary

This paper examines possibilities of implementation of advanced computer assisted audit techniques into verification of efficiency and effectiveness of application controls. Application controls i.e. input, processing and output controls should ensure the completeness and accuracy of records. The main computer assisted audit techniques could be categorized as: test data, integrated test facility, parallel simulation and online audit monitor. There is a possibility of utilization of these techniques in application control testing, but their implementation must be based on cost-benefit analysis since they are time-consuming and mostly must be tailored for each audit client.

Key words

application controls, audit, computer assisted audit techniques

Introduction

Organizations spend large sums of money in upgrading or installing new business application systems for different reasons, ranging from tactical goals, to strategic activities, such as using technology as an enabler of company differentiation in the marketplace. As with any technology that is used to support business processes, transactional applications may pose risks to the organization, which stem from the inherent nature of the technology and how the system is configured, managed, and used by employees. Those risks can have a negative impact on the integrity, completeness, timeliness, and availability of financial or operational data if they are not mitigated appropriately. One of the most cost-effective and efficient approaches organizations use to manage these risks is by using controls that are inherent or embedded into transactional applications. These types of controls are generally referred to as application controls. By combining these controls with manual ones, organization can develop successful control environment.

Due to the importance of application controls to risk management strategies, periodic audits of application controls are needed in order to determine if they are designed appropriately and operating effectively.

1. Application Controls

Auditors begin with consideration of internal controls built in computer system by getting acquainted with general controls. This approach is appropriate since efficiency of specific application controls in great deal depends on existence and effectiveness of general controls over all activities of information system.

While general controls apply to all organization system components, processes, and data, application controls are specific to a program or system supporting a particular business process.

The objectives of application controls are to ensure the completeness and accuracy of records, as well as the validity of the entries made to each record, as the result of program processing. According to traditional categorization, application controls can be in form of:

- Input controls,
- Processing controls and
- Output controls.

Input controls. Organizations need to set controls with aim to prevent erroneous data from being entered into computer system or to detect and remove mistakes from system and recapture the integrity of financial information. Input controls should be designed in such a manner to give reasonable assurance that input data is correctly authorized and entered into computer system. Completeness and accuracy of entered data depends on successful combination of different data check methods. The most important input controls are (Andrić, Krsmanović, & Jakšić, 2004):

- Validity controls,
- Batch totals,
- Check digits and
- Verification controls.

Processing controls. Data processing is inner activity of computer system based on programming instructions. Mistakes in data processing arise due to miscalculations, errors in program algorithms, use of wrong files of records, automatic executions of transactions that are not in accordance with management policy etc. Processing controls provide an automated means of assurance that processing is complete, accurate, and authorized.

Output controls. Output controls address what is done with the data and should compare output results with the intended result by checking the output against the input. Sometimes, output could be in a form of important confidential data, such as a list of payroll or customers. Access to this output by unauthorized individuals could result in loss of assets and credibility. In order to prevent these unfavorable events, organizations should set dissemination procedures only to authorized personnel.

2. Computer Assisted Audit Techniques

Auditors can exercise various tools and techniques (CAATs) based on use of computers. By using advantages of information technologies, auditors can verify internal controls, access records and generate information with productivity and efficiency, which could not be matched with manual audit approach. The most important computer assisted audit techniques are:

1. Test data,
2. Integrated test facility,
3. Parallel simulation, and
4. On-line audit monitor.

Test data. Test data technique is based on auditors' creation of input data that should be processed by client's application. Test data consist of correct and incorrect data. If incorrect data is entered into the system, auditor expects the input rejection. Results of input procedures are compared with expected behavior of application in order to determine whether input controls are in place. Phases of test data technique are depicted in Figure 1.

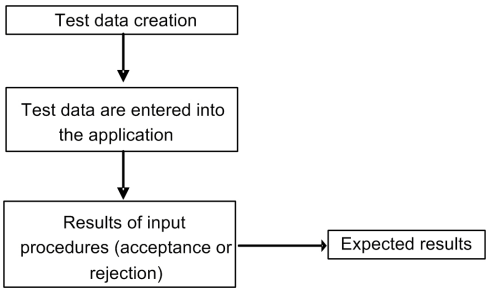

Figure 1 Test data

Auditors feel uncomfortable with the risk that client application during the period could differ from the one tested. In order to mitigate this situation, application of test data technique could be carried out by unexpected visit and copying of client's programs for later inspection.

Integrated test facility. Integrated test facilities are built-in test environments within a system. This approach is used primarily with large-scale, online systems serving multiple locations within the company or organization. Integrated test facility is a variation of test data technique. The main difference is that instead of checking information system while not in use, simulated data are added to client's real data and processed simultaneously. Results are compared with expected (Figure 2).

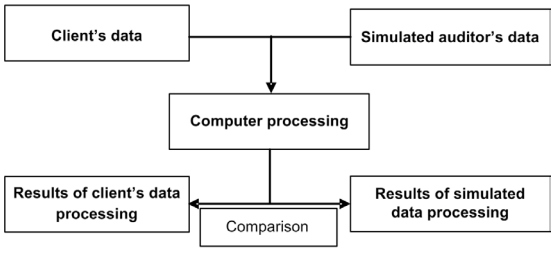

Figure 2 Integrated test facility

In order to avoid contamination of client's real data, procedures for separation and extraction of simulated data from the computer system should be defined before the application of integrated test facility technique and executed upon the end of testing.

3. Parallel simulation

In test data and integrated test facility techniques audit tests are based on simulated data, while in parallel simulation technique auditor uses actual data which is processed with clients' and auditor's program. Results of parallel programs execution are compared and validated (Figure 3).

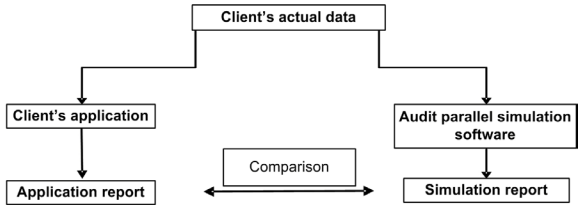

Figure 3 Parallel simulation

The main advantage in utilization of parallel simulation is a possibility than auditor's program could have additional controls embedded, which enables the valuation of effects of nonexistent control procedures. The main disadvantage lies in significant cost of audit programming if written uniquely for one client. Parallel simulation is the best technique for verification of calculations (depreciation, interest, taxes, payroll etc.).

4. Online audit monitor

Online audit monitor provides continuous audit through integration of audit program code into client's transactional application. Its task is to monitor transactions and makes extractions if certain criteria are met (specific transactions, unusual transactions, high risk transactions etc.).

In order to provide integration of audit program code into accounting system, new lines of program code should be added into client's computer program (audit hooks) which should enable the shift of control from client's program to audit code (Figure 4).

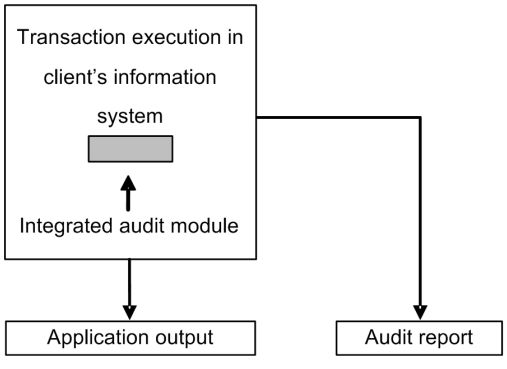

Figure 4 *Online audit monitor* (Bodnar & Hopwood, 2004)

If transaction meets predefined criteria, embedded audit module is activated and two possible procedures can be carried out:

a) Audit log creation or
b) Transaction tagging.

Online audit module is very advantageous since it can be exercised with systems which immediately process transactions without interrupting client's processing routines.

5. Application Control Testing Through Computer Assisted Audit Techniques

Audit objective in connection with application controls is to verify whether application controls satisfy control objectives and, if appropriate, to give recommendations for their improvement.

The sophistication of an organization's IT environment has a direct effect on the overall risk profile. The degree of transactional application complexity will drive the scoping, implementation, level of effort, and knowledge required to execute an application control review.

Computer-assisted audit techniques (CAATs) help ensure that appropriate coverage is in place for an application control review, particularly when there are thousands, or perhaps millions, of transactions occurring during a test period. In these situations, it would be impossible to obtain adequate information in a format that can be reviewed without the use of an automated tool.

Because CAATs provide the ability to analyze internal controls built into operations of computer system, a well-designed audit supported by CAATs testing can result in a reliable conclusion on efficiency and effectiveness of application controls.

Selection of the most appropriate computer assisted audit technique depends on characteristics of tested application control. Following tables gives the overview of recommended CAATs for different input, processing and output controls.

Conclusions

Although application of information and communication technologies in transaction processing results in specific risks, it also gives opportunities for improvement of control procedures.

Many controls can be integrated into functionality of transactional applications. Black box audit approach to transactional applications can no longer be accepted. Auditors cannot make conclusions with reasonable assurance about internal control system and accounting system if application controls were not tested.

Audit procedures for application controls testing can be improved if auditors utilize advanced computer assisted audit techniques. Application of these techniques should be based on cost-benefit analysis. The main restraint in broader use of

computer assisted audit techniques lies in fact that these techniques cannot be used „of-the-shelf“ but they must be „tailored“ to each audit client.

Development of computer assisted audit techniques requires a lot of devoted time, resources and expertise, which could be sustainable only in testing of most significant application controls for which constant monitoring or frequent testing is needed. In reference to financial statements audit, audit engagement should be contracted on a long-term basis in order to benefit from application control testing through utilization of computer assisted audit techniques.

Table 1 Recommended CAATs for various application controls

Domain	Control	Recommended CAATs
INPUT		
Data checks	Reasonableness and limit checks on financial values. Format and required field checks. Sequence checks (e.g., missing items), range checks, and check digits. Validations (e.g., stored table and drop - down menu of valid items).	Test data. Integrated test facility. Online audit monitor.
PROCESSING		
Automated functionality and calculations	Specific calculations conducted on one or more inputs and stored data elements produce further data elements.	Parallel simulation. Online audit monitor.
Audit trails	Automated tracking of changes made to data, associating the change with a specific user. Automated tracking and highlighting of overrides to normal processes.	Online audit monitor.
Interface balancing	Automated checking of data received from feeder systems (e.g., payroll, claims data, etc.) into ledger systems.	Integrated test facility. Online audit monitor.
OUTPUT		
Output accuracy	Output corresponds to processing results.	Integrated test facility.
Access and dissemination of data extraction, filtering, and reporting.	Extract routine outputs and reports are assessed for reasonableness and completeness.	Test data.

References

Andrić, M., & Dejan, J. (2001). Uticaj informacionih i telekomunikacionih tehnologija na reviziju računovodstvenih izveštaja. Anali Ekonomskog fakulteta u Subotici , 475-483.

Andrić, M., & Jakšić, D. (2001). Aplikativne kontrole. Revizor , 15, 34-51.

Andrić, M., Krsmanović, B., & Jakšić, D. (2004). Revizija - teorija i praksa. Subotica: Ekonomski fakultet Subotica.

Bodnar, G., & Hopwood, W. (2004). Accounting Information System. New Yersey: Prentice Hal.

Cascarino, R. (2007). Autor's Guide to Information System Auditing. New York: John Wiley & Sons, Inc.

Global Technology Audit Guide 8 – Auditing Application Controls. (2007). Retrieved May 3, 2009, from The Institute of Internal Auditors: http://www.theiia.org/

Senft, S., & Frederick, G. (2009). Information Technology Control and Audit. Boca Raton: Auerbach Publications.

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