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Leveraging Technology to Enhance Audit Quality and Effectiveness

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Introduction

Increasingly, government entities are dependent on information and communication technology (ICT), particularly internet enabled solutions to implement their policies and achieve their business objectives and outcomes.

Developments in ICT are also affecting audits undertaken by SAIs for two main reasons:

I. the change in the way audit clients are delivering services facilitated by ICT, as indicated above, and
II. the use of audit software to perform efficient audits in this changing environment, and to maintain audit working papers.

In meeting their audit mandate and delivering on their responsibilities, it is unavoidable that SAIs will have an increasing reliance on advanced technologies to support audit evidence gathering, analysis and testing, and to provide sufficient audit coverage. The development of ICT has produced specific tools and techniques that can help auditors to quickly and accurately obtain a greater understanding of the audited environment, gain valuable insights, and test controls and balances.

The idea and practice of using technology to assist in auditing was conceived many years ago. It is far from being a historical curiosity, and today it is not just relevant, but of critical importance.

Information Technology and Auditing

When looking back over the last decade or two of audit, we can see the general direction for information gathering, processing, and analysis has taken a quantum leap, largely benefitting from advances in ICT. The audit objectives however do not change with the introduction of computers.

As the American Institute of Certified Public Accountants noted in its *Evolution of Auditing*, when computer processing was simple, auditors relied upon manual procedures 'auditing **around** the computer' to validate the inputs and outputs.[1] As computer processing became more complex to cover end-to-end business processes, the paper format audit trail started to diminish and has been gradually replaced by electronic records. The 'auditing **around** the computer' approach could no longer provide sufficient assurance. The approach became one of 'auditing **through** the computer' to actually test both the controls and transactions of computer systems.

'Auditing **with** the computer' applies to even more complex computer processes. It entails direct evaluation of computer software, hardware, and processes, which when combined with appropriate testing provides a higher level of assurance when contrasted with 'auditing **around** the computer' for more complex applications.[2]

The development of ICT has changed people's behaviour in exchanging information. The advancement of ICT provides people with multiple methods and channels to obtain and disseminate information: email, Internet, social media, twitter and smartphone apps, just to name a few. Now people want more information faster, in a more concise and accurate way and available from

[1] *Whitepaper – Evolution of auditing*, Byrnes. P, et al, AICPA, 2012
[2] Ibid.

multiple channels. Further, when dealing with government, citizens want to interact, not just passively receive information.

The volume of information we encounter in our daily work has increased exponentially, as we increasingly rely on technology for automatic processing. According to the *Digital Universe Study* conducted by the International Data Corporation (IDC), the global data supply reached 2.8 zettabytes (ZB) – or 2.8 trillion GB – in 2012.[3] It was estimated that in 2013, some 98 percent of information produced worldwide was in digital format (the other two percent was captured in different mediums, such as paper). As a category, digital information only represented 25 percent 10 years ago.

There is a continuous shift of business processes and information content towards electronic methods and digital formats – and from an audit perspective this introduces new and different types of risks. Many of these risks are unique to the ICT environment, and require us to adopt the 'auditing with the computer' approach.

Focus of This Paper

IT auditing has had a relatively short yet rich history when compared to auditing as a whole, and remains an ever changing field.

In this paper, we introduce the ANAO's current practice and experiences on the technology front, including leveraging audit tools to improve the ANAO's effectiveness and efficiency supporting financial statement audits and applying advanced techniques. We also refer to in-depth data analysis to provide valuable insights for our performance audits. The paper also concludes with a description of our strategic direction on how we plan to further embrace technology to respond to some of the future challenges.

The External Environment (Australian Government)

In the last 30 years, Australia has moved from a model of public sector management which centralised authority to a much more devolved model with each agency responsible for the delivery of services and achievement of outcomes as expected by legislative and policy requirements.

There is significant disparity in the size and business complexity of government entities. It is also an important feature of Australian Government that the head of each government entity has discretion and autonomy to determine their operations subject to approaches adopted being consistent with legislative and policy requirements.

Significantly, the Australian Government has adopted a broad approach of using ICT to increase public sector productivity.

As a pre-election commitment, the Government released its e-Government Digital Policy in September 2013, which set out a model of a 'digital by design' public service. The key objectives were to develop efficient, cost effective, user friendly and personalised online services for citizen

[3] *The Digital Universe in 2020: Big Data, Bigger Digital Shadows, and Biggest Growth in the Far East*, Gantz. J, Reinsel. D, IDC iView, 2012

interactions.[4] Virtually all government interactions with the public were to be able to be conducted digitally by 2017[5].

To date, government implementation of ICT solutions has been agency-focused. This characteristic presents challenges to agencies when implementing ICT based service delivery solutions under the whole-of-government approach mandated by the Australian Government. The challenges include computer system interoperability and the efficiency, effectiveness and security of transferring data and sharing information between agencies, people and businesses.

Some of our performance audits have identified these challenges, and observed the effort undertaken by government agencies to overcome them, and also noted various degrees of success and identified a number of issues.

Online public service provision, as promoted by the government, can help businesses save time and reduce administrative burdens. It also increases the requirement for ICT to be a means to improve productivity. A 2013 OECD study noted that Australia was ranked the highest among member countries for businesses to conduct online interactions with public authorities for fully transactional services, such as electronic handling of administrative procedures.[6]

Each ICT initiative, however, brings its own challenges to audit. As more public services move towards the online delivery model, we need to adjust our audit focus and acquire new audit skills to maintain our capability, and continue to produce quality audits.

ANAO's Responsibilities and Objectives

The ANAO provides a full range of audit and assurance services to the Australian Parliament and Australian government public sector agencies and statutory bodies.

Under the *Auditor-General's Act 1997* (A-G Act) and the *Public Governance, Performance and Accountability Act 2013*, the ANAO has the mandate to conduct financial statement audits of the Australian Government public sector entities. The A-G Act also provides the Auditor-General with the power to conduct a performance audit, assurance review, or audit the performance indicators, of an Australian Government public sector entity (or a government business enterprise, if requested by the Joint Committee of Public Accounts and Audit at any time.

[4] *The Coalition's Policy for e-Government and the Digital Economy*, September 2013. http://lpaweb-static.s3.amazonaws.com/Coalition%27s%20Policy%20for%20E-Government%20and%20the%20Digital%20Economy.pdf website accessed on 09 January 2015.
[5] Andrew Robb MP - Federal Member for Goldstein, *Speeches Transcript - Robb & Turnbull - Press Conference ICT Policy Launch*, September 2, 2013, http://www.andrewrobb.com.au/Media/Speeches/tabid/73/articleType/ArticleView/articleId/1562/Transcript--Robb-Turnbull--Press-Conference-ICT-Policy-Launch.aspx website visited on January, 2015
[6] Government at a Glance 2013, OECD

Last financial year (2013—2014), the ANAO issued 260 financial statement audit opinions, produced 76 assurance audit reports and completed 50 performance audit reports that targeted specific government programs and services.[7]

For the relatively small ANAO workforce[8] to deliver such amount of work, the effectiveness of our business operational model is dependent upon partnering with accounting firms on some audits and leveraging technology. The decision to apply technology in our audits and the investment in building ICT audit capability are based on the benefit they provide to the audit overall. The steady increase of requests by our performance audit teams for ICT assistance , in particular requesting in-depth data analysis, reflects the increasing level of recognition within the office of the value added by specialist ICT audit skills to a wide range of audits. For example, currently, 19 out of the 45 performance audits in progress require various degrees of ICT audit involvement.

In line with the Australian Government ICT strategic framework,[9] the ANAO has developed and continuously maintains an ICT strategy that focuses on building the right technology capability, operating environment and culture. The ICT strategy supports the ANAO's strategic statement and business plan and also enables the changes to our business as it transforms into a digital enterprise.[10] In this aspect, the ANAO is on the same trajectory as mainstream Commonwealth Government agencies in leveraging technology to do our job better and more cost effectively.

Meeting the Challenges

The ever increasing challenges to maintain high levels of audit quality and cost effective operations require us to adopt a strategy that is agile and robust in supporting and optimising audit execution in a seamless fashion.

Audit Process Automation

In preparing audit evidence, electronic format is preferable over print copies because it is cheaper to move, process and store, and is easier to share, review and check.

The validity of electronic documents is clearly acknowledged in the *Electronic Transaction Act 1999* and the Commonwealth *Evidence Act 1995*.[11] The Federal Court of Australia states in its *Practice Note CM6,* [12]that digital records are more desirable because the identification, access, search, review and analysis of digital records is more effective and efficient. It also acknowledged that printing electronic documents and photocopying paper documents will generally be a waste of time and money.

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[7] *The Auditor-General Annual Report 2013–2014*, ANAO http://www.anao.gov.au/html/Files/Annual%20Reports/HTML/annualreport_1314/index.html

[8] As at 30 June 2014, the ANAO has 361 staff members.

[9] *Australian Public Service Information and Communication Technology Strategy 2012-2015*, Department of Finance, 2012

[10] *The ANAO Information Technology Strategic Plan 2015-2019*, ANAO

[11] Comlaw, the Australian Government website. http://www.comlaw.gov.au/

[12] *Practice Note CM6*, Federal Court of Australia. http://www.fedcourt.gov.au/law-and-practice/practice-documents/practice-notes/cm6

To support our business needs, the ANAO has implemented a computerised audit management application *(Teammate)* to support automatic workflow for financial statement audit. We have also implemented a document management application *(E-Hive)* to centrally manage audit related documents primarily to support our performance audits.

The *Teammate* software solution provides for the full electronic maintenance of audit files. This technical solution also enforces consistent audit procedures across all financial statement audits through a built-in audit process workflow that was designed to correspond with the ANAO audit methodology. Through reducing manual operations and facilitating timely document sharing, the workflow solution makes it easier for audit managers and signing officers to monitor and track audit execution and to respond to exceptions. It also applies quality controls and simplifies processes that help us to achieve better operational efficiency.

To further enhance Teammate's capability, we also collaborate with other major users, such as the Auditor-General's offices in New Zealand and Canada, to share experiences for mutual benefit.

The need to engage with clients during audit work means that our auditors frequently traverse between the office and multiple client sites to conduct fieldwork. Therefore supporting a mobile workforce is essential. The ANAO has implemented technologies that facilitates secure remote connections to the core information hub for our entire audit workforce, enabling our auditors to work from any location in the country as long as internet communication is available.

Our main electronic channel for external facing information dissemination is the ANAO website. In responding to the steady shift from requests for paper print audit reports to self-serve access of the electronic version, and also the increasing citizen contributions to our performance audits, we are currently implementing a project to transform our internet website (www.anao.gov.au) to a more interactive and user friendly design. We are also using twitter to publicise the release of our reports and we have increased our twitter follower population base from 300 to 1400 in the last 18 months.

Adoption of the above ICT solutions has built a solid foundation for the ANAO to optimise audit operational efficiency and to improve the overall audit quality.

Assist Financial Statement Audit

A central element of the ANAO's financial statement audit methodology is developing a sound understanding of government entities' responsibilities and internal controls, which is underpinned by the 'risk and response' approach defined in both International and Australian Auditing Standards.[13] One of the key elements of internal control contained in ASA is '*the information systems, including the related business processes relevant to financial reporting and communication*' and this requires the audit team to use specialised ICT audit skills for evaluation and testing.

Virtually all Australian government entities use computerised systems to manage their financial related business operations, and this requires a broader involvement of ICT audit in our financial statement audits. We take an integrated approach that involves ICT audit right from the beginning

[13] In particular, ASA315/ISA315: Identifying and assessing the risks of material misstatement through understanding the entity and its environment; and ASA330/ISA330: The auditor's responses to assessed risks. *Australian Auditing Standards*, Australian Auditing and Assurance Standards Board http://www.auasb.gov.au/Pronouncements/Australian-Auditing-Standards.aspx

stage of audit planning and then maintain close engagement through audit execution to final reporting.

At the planning phase, the joint effort between IT auditors and financial statement auditors is directed to identifying and assessing risks of material misstatement through understanding the entity and its environment. During the interim phase, ICT auditors utilise their special skills in testing and analysing the adequacy of key ICT general controls. For the final phase, ICT auditors can assist through conducting integrity testing ICT application based controls aiming at quantify potential issues.

The advances in ICT has also resulted in many software providers incorporating additional functionality that can be utilised to assist the audit process.

Commercial-off-the-shelf (COTS) software products are commonly used by Australian Government entities to support their generic business functions, such as financial and human resources business operations. For example, there are around 20 government agencies that use SAP (a German enterprise resource planning software product) to support their accounting and/or HR processes. In Total SAP carries out about 85 percent of the dollar value of government financial transactions.

In recognition of this situation, the ANAO has published a better practice guide – *Human Resource Information Management Systems Risks and Controls* [14]– to assisting agencies to implement effective and efficient HR and payroll processes. Additionally, we have invested in purchasing a special analytical software tool called '*SAP Assure*' to enhance our financial statement audit capability for testing and analysing the government entities' use of SAP system.

The capability of SAP Assure enables us to conduct in-depth analysis and evaluation of the client SAP system configuration control, as well as extending to structured data interrogations at the transaction level. It can assist auditors to automatically execute a transaction integrity test that covers the entire population – that is, conducting full substantive testing. Apart from gaining operational efficiency through employing appropriate audit tools, we can greatly expand the depth and breadth of audit testing and analysis, which ultimately leads higher level of audit assurance.

By using the SAP Assure tool, the ANAO financial statement audit teams are able to perform a consistent testing approach across multiple government entities and improve the audit coverage of clients' financial activities. This contributes to achieving an appropriate level of audit assurance for these generally more complex audits.

Audit Specific ICT Areas

The proliferation of computer system based business processes has led to the implementation of ICT business solutions that reach wider areas and bring new opportunities and benefits, as well as creating new risk exposures or accentuating old vulnerabilities.

Increased connectivity creates unique ICT risks in respect of such matters as cyber security, data integrity, computer system interoperability between different government entities, ICT system availability and business continuity. To address these risks, government agencies are required to

[14] *Human Resources Information Management Systems Risks and Controls*, the ANAO. http://www.anao.gov.au/~/media/Files/Better%20Practice%20Guides/2012%202013/ANAO_BPG_HRMIS.pdf

take appropriate action. When combined these matters elevate the risks to a strategic level and consequently, the ANAO conducts specific audits in these ICT areas.

The protection of Australian Government ICT systems and information from unauthorised access and cyber-attacks is a key responsibility of agencies, having regard to their business operations and specific risks. Those risks can range from threats to national security through to the disclosure of sensitive personal information.

Managing cyber security is fundamental to the integrity of Australian government administration, and, the ANAO has conducted a cross agency cyber security audit – '*Cyber Attacks: Securing Agencies' ICT Systems*', which was tabled in parliament in June, 2014.[15]

Cyber security is a complex and ever evolving technical sphere that requires the IT auditor to develop a high-level of technical know-how. The ANAO has therefore developed a specialist ICT audit team that is skilled in technical research and innovation, and which draws on external advice as required.

Data Analysis

Fuelled by new technology initiatives, the amount of data available from business operations has increased exponentially. Both business management and audit can leverage this data through data analytics to derive valuable insight drive operational efficiency and improvements in compliance.

Data analytical exercises require varying degrees of technical input. To facilitate data analysis activities, the ANAO has purchased a number of data analytical software and high-performance computer hardware. As previously explained, in supporting financial statement audit, we use SAP Assure to focus on transactional-based analytics to identify exceptions by applying specific business rules-based filters in key areas of risk such as procurement.

The various advantages of data analytics have also lead to its growing use in our performance audit program. Assisted by the acquired tools and ICT special skills, performance auditors can use data analytics methods to sift through massive data volumes and uncover hidden patterns, trends and exceptions/anomalies that may indicate control issues or identify opportunities to improve operational effectiveness. It has the ability to help auditors quickly and accurately hone-in on business areas or transactions of greater audit interest and provide detailed insight to lead to valuable recommendations to our clients.

Data analytics has a wide range of involvement in our audits. In some audits, data analysis is used as a method to supplement our traditional analysis, whilst in other audits it is critical to providing evidence to support the overall audit outcomes.

Effective use of data analytics results in a more focused audit that can pinpoint the specific areas of risk, foster dynamic audit planning and execution that provides a better balance of controls analysis and transactional analytics based on the underlying risks.

A by-product from data analytics is audit report presentation. It can assist us to communicate messages to audiences in a more intuitive way – through effective visualisation of our audit findings

[15] *Cyber Attacks: Securing Agencies' ICT Systems*, ANAO Audit Report No.50 2013–14. http://www.anao.gov.au/Publications/Audit-Reports/2013-2014/Cyber-Attacks-Securing-Agencies-ICT-Systems

– graphs and charts. We can now link our analysis results to publicly available information, for example geospatial databases,[16] to provide audit audiences a graphic image of our audit findings in relation to demography or locations of government services.

Capability Building – the Human Factor

As we focus on the transformative new information technology solutions and its tremendous, high-speed changes, we also understand its impact on the human element—because all data, tools and strategic plans are only as good as the people who use and implement these tools.

The increasing demand for ICT involvement and support has put pressure on us to improve our ICT audit capability. One of the top challenges, as highlighted by a number of professional service firms, is that there are not enough auditors who possess the know how to actually apply current technologies in an efficient and effective way.

Our approach to capacity building is not to train every performance and financial auditor to become an ICT expert, but rather to build a capability that can leverage ICT audit skills as an important complement to assurance and performance audit skills.

In responding to the demand for skilled ICT analysts, the ANAO has expanded the IT Audit branch over the last few years. Leveraging on our existing experience, supplemented with newly recruited specialists and reinforced with advanced tools, the IT Audit branch has developed into a 'centre of excellence'. The evolving role of IT Audit branch as a 'Centre of Excellence' is to harness expertise and innovation with the capabilities to support both financial statement audits and performance audits, and as well as conducting special ICT audits.

Raising the level of ICT awareness and knowledge is fundamental to achieving the outcomes of deploying technology to improve quality and effectiveness. This has required strong leadership to encourage behavioural and cultural change that supports this outcome, our strategy is to continuously engage with performance and assurance audit teams to raise the general awareness of staff in relation to their use of ICT and setting the stage for long-term transformation that can fully comprehend the overall audit outcome.

One element especially critical to enhancing technology in auditing is maintaining awareness of the evolving context. Therefore investing in continuous staff professional development and building a team of specialists is key to maintaining the technical skill and mending any knowledge gap,[17] as well as turning to external expert resources for assistance under certain circumstances. It is also beneficial to continuously evaluate and refine our audit methodology, always aiming at delivering quality audit outcomes, particularly in light of the fast evolving technology.

[16] *Initiatives to Support the Delivery of Services to Indigenous Australians*, ANAO Audit Report No.45 2013–14. http://www.anao.gov.au/~/media/Files/Audit%20Reports/2013%202014/Audit%20Report%2045/AuditReport_2013-2014_45.PDF

[17] *Whole-of-government ICT strategic workforce plan 2010-2013*, Australian Public Service Commission

The Road Ahead

The challenges for auditing in the years ahead come from multiple fronts. On top of the traditional audit assurance required by stakeholders, there are demands for more value adding outcomes from the analysis and insight we bring to our work. The increased scrutiny by the public of the government programs and service deliveries reflects the increasing demand for higher degree of information integrity.

Additionally, the government policy of 'digital by design' for all agencies to achieve better services and cost effective operations also adds to the complexity to our work. Some examples are:

- government agencies are increasingly moving services towards online, which can potentially cause a shift of business delivery mechanism that adds complexities to the environments that we audit. This in turn will require us to adjust and adopt new audit approaches.
- managing effective cyber security will remain a major undertaking for the government. The complex, persistent and constantly changing risk factors in the cyber environment require government agencies to maintain agile and robust defence mechanisms at all time. It also presents challenges to auditors to keep abreast of cyber security developments, such as tools, skills and knowledge, in order to successfully execute audits that have security relevance.
- the government decision to adopt the idea of 'big data', compounded by the whole of government approach, will induce more data exchange and information sharing between government agencies, people and businesses. This will substantially increase the volume of information, the velocity of transactions, and the range and types of data that we encounter during audits. The demand for data analysis will also increase, and will need to be addressed in our future capability building.

All these challenges require us to put more focus on leveraging ICT audit in our future audit work. The service delivery of our work program will require using ICT audit as an enabler and as a key driver in our audit coverage.

In response to the ongoing trend of transformative changes in the public sector, we must take a forward looking approach for technology involvement and capability building. Looking forward, ICT audit should be in a strategic partnership role with our core audit business rather than remaining in a supporting role. This requires us to continually build on our current inclusive and integrated operational model that fosters good communication between audit managers and ICT audit specialists to fully utilise complementary skills and knowledge.

Conclusion

Given the high demand for audit assurance that provides unique insights, and the proliferation of ICT solutions in government operations, ICT topics will take up an increasing share of future audits. It is also expected that auditors will increasingly rely on using technology, such as advanced data analytics to strengthen audits. ICT audit will be a key driver to further improve our audit quality and effectiveness.

Our experiences demonstrate that embracing technology to enhance and extend the reach of our audit effort is an important and strategic undertaking. It requires an effective strategy, forward thinking, innovation, expertise and the right technology. It is important to develop and maintain a strategic approach and continuously refine the delivery model through effective evaluation method to measure and assess the achievements against expectations and anticipate future changes, and will require strong leadership and executive support.