



Department of Accounting
Faculty of Management Studies and Commerce
University of Sri Jayewardenepura, Sri Lanka

**THE EXTERNAL AUDIT FUNCTION IN A DIGITALISED BUSINESS ENVIRONMENT
AND ITS IMPLICATIONS ON BUSINESS PROCESS REENGINEERING: A CASE STUDY
OF A LEADING AUDIT FIRM IN SRI LANKA**

Dananjaya BLM, Samudrage DN

Department of Accounting, University of Sri Jayewardenepura

ABSTRACT

This paper aims to explore how the scope of the external audit function has changed with digitalisation, analyse the changes in working practices within audit firms, assess the extent and implications of the skills gap created by digitalisation among external auditors, and investigate the influence of digitalisation-driven technological advancements on the success of Business Process Reengineering (BPR) initiatives in audit firms. Using a qualitative case study approach, data was collected through structured interviews with manager-level auditors, associate-level auditors from one of the Big Four audit firms and representatives from its client companies. The collected data was analysed thematically. The research reveals that while the core scope of external auditing remains unchanged, digitalisation significantly alters working practices. Notably, Key Performance Indicators (KPIs) have improved as a result of these changes; however, a widening skills gap among auditors has emerged as a new challenge affecting KPIs. These findings hold practical value for audit firm partners and managers, enabling them to establish novel operational standards and goals while proactively addressing the identified skills gap through targeted upskilling initiatives. Ultimately, this study contributes to a deeper understanding of the under-researched interplay between digitalisation, BPR, and the external audit function, shedding light on the critical role of technological advancements in ensuring BPR success within audit firms.

Keywords: Audit Firms, Business Process Reengineering, Digitalisation, External Audit Function, Skills Gap, Working Practices

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✉ blmdananjaya@gmail.com

✉ dileepask@sjp.ac.lk

1 INTRODUCTION

The COVID-19 pandemic has catalysed a significant shift in the business environment, accelerating the 'Work from Home' trend and leading to a rapid digitalisation of operations. This transformation has resulted in an unprecedented increase in the volume of digital content generated globally (Betti & Sarens 2021). As audit firms navigate this evolving landscape, key developments such as 'Big Data', 'Data Analytics', and 'Blockchain Technology' have emerged, fundamentally altering audit practices. Data and analytics are now recognised as crucial drivers of value; nearly 70 percent of C-level executives assert that these tools are vital for future revenue growth, with 55 percent having already adjusted their business strategies to address the challenges posed by big data (KPMG 2015).

These developments have significantly impacted audit firms (Cao et al. 2015). The Big Four audit firms: KPMG, Ernst and Young, PricewaterhouseCoopers, and Deloitte increasingly adopt data analytics to enhance their external audit functions (Liew et al. 2022). This shift has not only transformed the external audit function but has also redefined the role of external auditors, moving them from traditional methods reliant on Microsoft Excel to more sophisticated analytical tools (Liew et al. 2022). According to Lugli and Bertacchini (2022), the focus of audit firms has expanded from significant processes to a comprehensive analysis of all operational processes, necessitating a shift in skill sets for both new and existing external auditors. This evolution has resulted in a pronounced skills gap, as external auditors must cultivate advanced analytical competencies to remain relevant in a rapidly changing environment (Liew et al. 2022).

Furthermore, the emergence of "citizen data scientists" within the auditing profession highlights a critical issue; the encroachment of data science into audit roles, which some argue threatens to "de-professionalise" the field (Salijeni et al. 2019). Citizen data scientists are professionals who, despite lacking formal training in data science, conduct statistical analysis as a part of their job responsibilities. Liew et al. (2022) emphasise that contemporary graduates entering the Big Four audit firms must possess digital and analytical skills to adapt to these changes.

The digitalisation of auditing processes necessitates a fundamental redesign, often called Business Process Reengineering (BPR). This approach involves a radical rethinking and redesigning of business processes to significantly improve performance metrics including cost, quality, service, and speed (Hammer 1990). While previous literature emphasises the role of technological advancements as a critical success factor in BPR (Hammer & Champy 1993, Attaran 2003), there remains a gap in understanding how recent digitalisation-driven technological advancements specifically influence the success of BPR in audit firms.

Considering these developments and challenges, the overarching aim of this study is to investigate the impact of digitalisation on the external audit function and its implications for BPR in audit firms. By addressing this aim, the study will explore how the scope of the external audit function has changed with digitalisation, analyse the changes in working practices within audit firms, assess the extent and implications of the skills gap created by digitalisation among external auditors, and investigate the influence of digitalisation-driven technological advancements on the success of BPR initiatives in audit firms.

The remaining sections of this study are structured as follows: the next section discusses the existing literature and identifies further gaps, the third section elaborates on the research

methodology, the fourth section presents the analysis and discussion, and the conclusion is provided in the final section.

2 LITERATURE REVIEW

This literature review synthesises existing research on the impact of digitalisation on the external audit function, identifies gaps in current understanding, and presents a theoretical framework for empirical investigation. Key concepts explored include digitalisation, big data analytics, the external audit function, and BPR. The review highlights the relationships among these concepts and identifies areas for further research.

2.1 Digitalisation and Audit Functions: Impacts and Challenges

Digitalisation has introduced new risks and challenges within the business environment, significantly affecting both internal and external audit functions. Betti and Sarens (2020) discuss how digitalisation has transformed the internal audit function, emphasising the need for new skills and the increased use of data analytical tools. Their research highlights the changing role of internal auditors, who must now possess a wider range of competencies to navigate the digital landscape. For example, internal auditors must be proficient in data mining, data analytics, and data visualisation to analyse large volumes of organisational data effectively. However, Betti and Sarens (2020) do not extend their findings to the external audit function, leaving a gap in understanding how digitalisation specifically impacts external auditors and their roles.

In a subsequent study, Betti and Sarens (2021) continue to explore the evolution of internal audit practices due to digitalisation. Their research reveals that internal auditors increasingly adopt data analytics to enhance risk assessment and testing procedures. The use of data analytics enables internal auditors to gain deeper insights into an organisation's operations and identify potential risks more effectively. However, the study is limited to the internal audit context and does not address the external audit function. The lack of empirical evidence regarding the external audit function, particularly in less regulated environments like Sri Lanka, underscores the importance of examining how digitalisation influences external auditing practices and the associated skill gaps.

Lugli and Bertacchini (2022) note that advancements in computing power among Big Four audit firms enable comprehensive data analysis beyond traditional sampling methods. This capability allows auditors to analyse entire populations rather than relying solely on samples, thereby increasing the likelihood of detecting fraud. These authors emphasise that the shift in tools used has altered the nature of the problems encountered during audits, highlighting the need for auditors to adapt to these changes. For example, auditors must now possess data manipulation, data analysis, and data interpretation skills to utilise advanced analytical tools effectively. However, while the increased utilisation of analytical tools enhances audit quality, the implications for the external audit function's scope and the necessary skills for auditors remain inadequately addressed in the literature.

The integration of big data analytics into audit practices is increasingly recognised as essential. Liew et al. (2022) highlight the necessity for new accounting graduates to acquire data analytical skills to thrive in the profession. Their research investigates the specific data analytical tools utilised in Big Four audit firms, the rationale for their adoption, and how these tools have changed the requirements for auditors. For instance, auditors must now be

proficient in tools like Tableau, Power BI, and ACL Analytics to perform data-driven audits. However, while these authors focus on the working practices within the external audit function, they neglect to address the changes in the scope of the external audit function itself.

Dagiliene and Kloviene (2018) identify both company-related and institutional factors that incentivise auditors to adopt big data analytics in their work. Company-related factors include the audit firm's size, the client's size, organisational structure, and the presence of professionals with experience in big data analytics. Institutional factors encompass market competition, national audit regulator policies, and educational frameworks. For example, larger audit firms with more resources are more likely to invest in big data analytics tools, while the presence of experienced data analysts within the firm can drive the adoption of these technologies. While this research sheds light on the motivations behind the adoption of big data analytics, it lacks empirical evidence demonstrating how these factors influence changes in the external audit function's scope and working practices. Furthermore, the impact of digitalisation on the auditors' skills gap is not explored.

2.2 BPR in Different Contexts

Research on BPR emphasises various critical success factors that can influence its implementation across different sectors. Ahmad et al. (2007) identified several key factors crucial for the successful implementation of BPR in higher education, including teamwork, quality culture, quality management systems, effective change management, and technological advancements. These authors argue that a strong quality culture and well-defined quality management systems are crucial for driving process improvements in academic institutions. Effective change management is also highlighted as a key factor, as BPR often requires significant organisational transformations.

Similarly, Attaran (2003) asserts that technological advancements are crucial for BPR, as they create value through cost reduction, quality improvement, and integration with customers and suppliers. This author provides examples of how information technology enables process automation, data analysis, and improved communication, ultimately leading to more efficient and effective business processes. Attaran (2003) emphasises that organisations must carefully align their BPR initiatives with technological capabilities to achieve the desired outcomes.

Arredondo et al. (2019) highlight that BPR in the software development process positively impacts cost reduction, time efficiency, and client satisfaction through improved project flow. These authors present a case study of a software development company that implemented BPR principles, such as process standardisation, task automation, and enhanced communication. The results demonstrate that BPR can lead to significant improvements in project management metrics, ultimately benefiting both the organisation and its clients.

Doomun and Jungum (2008) emphasise that BPR is an ongoing process requiring continuous improvement strategies, demonstrating the dynamic nature of business environments. These authors argue that organisations must continuously monitor and adapt their processes to keep pace with changing market demands, technological advancements, and customer expectations. Their research, which applies BPR principles to a call centre, highlights the importance of adopting a flexible and iterative approach to process redesign.

Groznik and Maslaric (2011) argue that BPR in distribution channels should be well-balanced and integrated with technological advancements. These authors present a case study of a

Slovenian retail company that implemented BPR to improve its distribution processes. The study emphasises the need for a holistic approach that considers both process redesign and technology integration. Groznik and Maslaric (2011) stress that organisations must carefully evaluate their existing processes, identify areas for improvement, and then select appropriate technologies to support the redesigned processes.

However, there is a notable lack of research specifically focused on BPR within audit firms, creating a significant gap in the literature. The application of BPR principles to the audit function has not been adequately explored, presenting an opportunity for this study to offer new insights. Although research on BPR in areas like higher education, software development, and distribution channels offers valuable insights and frameworks, the distinct characteristics and challenges of the audit profession necessitate dedicated investigation.

The concept of BPR was pioneered by Michael Hammer, whose influential article, "Reengineering Work: Don't Automate, Obliterate," published in 1990 provides foundational insights into the field. BPR involves a fundamental rethinking and radical redesign of business processes to achieve significant improvements in KPIs, including cost, quality, service, and speed (Hammer 1990).

BPR primarily depends on technological advancements. Hammer (1990) emphasises that the power of modern technological advancements must be utilised to make radical changes in processes to achieve significant improvements. Thus, technological advancements, which have emerged with digitalisation, are considered a critical success factor for BPR.

Accordingly, the literature reveals significant gaps in understanding how digitalisation influences both internal and external audit functions, particularly regarding changes in working practices, skill gaps, and the application of BPR. This study aims to address these gaps by exploring how the scope of the external audit function has changed with digitalisation, analysing the changes in working practices within audit firms, assessing the extent and implications of the skills gap created by digitalisation among external auditors, and investigating the influence of digitalisation-driven technological advancements on the success of BPR initiatives in audit firms in terms of cost, quality, speed, and service. By developing a conceptual framework to guide empirical research, this study will contribute to a deeper understanding of the implications of digitalisation for external auditing in a digitalised business environment, ultimately informing future research and practice in the field.

3 RESEARCH DESIGN AND METHODS

This section mainly focuses on the study's research design and methods. Accordingly, this section discusses the research approach, theoretical framework, empirical site, and data collection.

3.1 Research Approach

This study adopts a qualitative case study approach by selecting one of the Big Four audit firms, referred to as "ABC firm" as the empirical site.

3.2 Theoretical Framework

Building upon the insights gained from the literature review, Figure 1 illustrates the theoretical framework of this study.

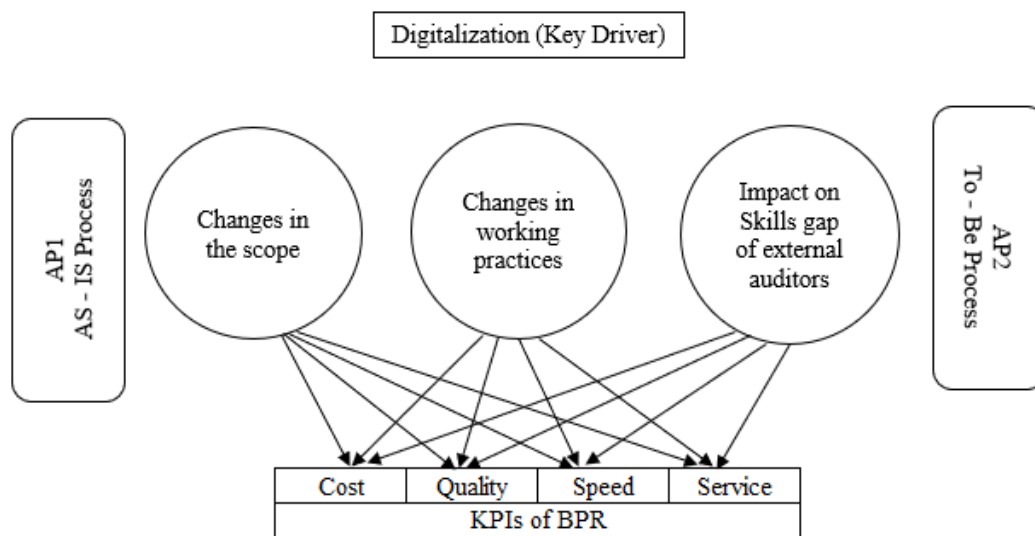


Figure 1: Theoretical Framework

Source: Author Constructed

3.3 Empirical Site

ABC firm was selected as the empirical site to gain deeper insights into this research problem. ABC firm, one of the Big Four audit firms in the world, seems to have adopted the technological and digital advancements discussed earlier in their external audit function, which is their main business function. For instance, AP2 was introduced by ABC firm in 2019 replacing the AP1 software which was the external auditing workflow their auditors used to follow. AP2 has brought together powerful data and analytics capabilities, innovative new technologies, and proven audit workflow to the practice (KPMG 2022). The auditing process under AP2 has brought significant changes to the auditing process with a redesign (KPMG 2021). Due to the reason that ABC firm is currently implementing such a redesigned auditing process, ABC firm was picked out as the research site for this study. Auditing processes under AP1 and AP2 are demonstrated in Figure 2 and Figure 3.

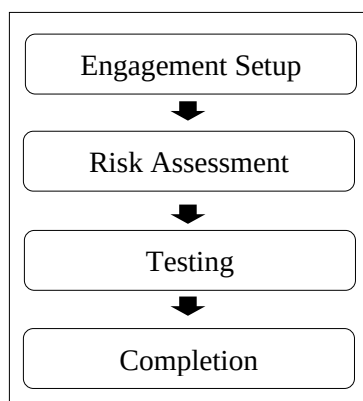


Figure 2: Auditing Process under AP1

Source: KPMG 2021

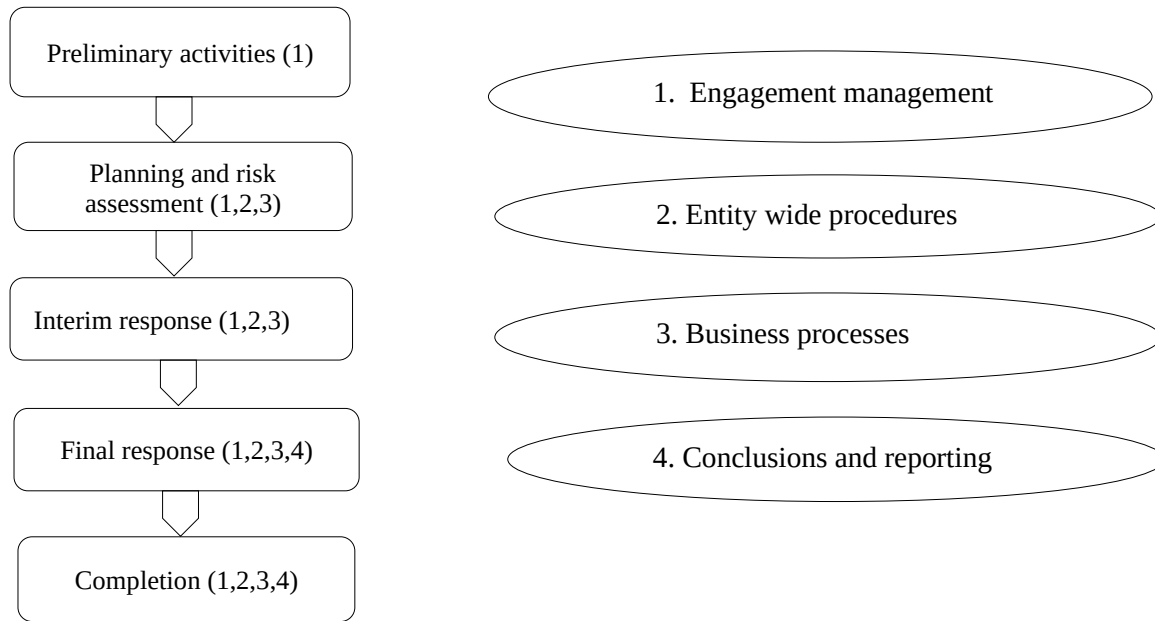


Figure 3: Auditing Process under AP2

Source: KPMG 2021

3.4 Data Collection

The objective of the data collection was to gather the perceptions of associate-level auditors, audit managers, and representatives from client companies of ABC firm regarding the digitalisation and BPR that have occurred within the firm. By including these three groups, the study captures a broad range of experiences and opinions, covering both the execution (Associate-level auditors) and oversight (Audit managers) aspects of auditing, along with client feedback, which is crucial for understanding the overall effectiveness and implications of any process changes. Structured interviews were conducted with associate-level auditors, audit managers, and representatives from client companies of ABC firm. Purposive sampling was employed to select participants for the interviews from each category, focusing on individuals with relevant experience related to process changes.

When selecting associate-level auditors, those with experience in two different processes were chosen to ensure a comprehensive understanding of the changes. Audit managers were selected based on their tenure at ABC firm, while representatives from client companies were chosen based on the duration of their engagement with ABC firm. Additionally, snowball sampling was utilised, whereby some managers and associate-level auditors recommended other colleagues for interviews. For instance, during the first interview with an associate-level auditor, another auditor was suggested for subsequent discussion.

The interviewed managers possessed extensive knowledge of digitalisation and its effects on audit workflows. The associate-level auditors were sufficiently experienced to engage in discussions on the relevant topics. The client representatives had been collaborating with ABC firm for a significant period, particularly regarding financial statement audits.

The sample comprised of three managers from ABC firm, three associate-level auditors, and representatives from three client companies. The interviews with audit managers lasted between 30 and 60 minutes, while interviews with associate-level auditors ranged from 20 to 50 minutes. Interviews with client representatives lasted between 10 and 15 minutes.

The interviews with audit managers and associate-level auditors helped to collect the views of those interviewees on digitalisation, change in the workflow, and the impact of change in the workflow. The interviews with clients were used to either affirm or reject the statements made by managers and associate-level auditors.

Individuals at each level within ABC Firm have distinct job roles and responsibilities. Manager-level auditors primarily focus on planning, supervising, negotiating, and managing, while associate-level auditors concentrate on risk assessment procedures, audit fieldwork, and completion procedures.

The list of interviews undertaken with profiles is shown below in Table 1.

Table 1: List of Interviews Undertaken

Category	Interviewee	Designation	Gender	Experience in the organisation	Duration of recorded interviews	Transcript pages
Manager-level auditors	M1	Associate director	Male	9 years	66 minutes	5
	M2	Project Manager	Male	6 years	60 minutes	6
	M3	Project Manager	Male	5 years	32 minutes	4
Associate-level auditors	A1	Associate 1	Male	2 years	50 minutes	4
	A2	Associate 1	Female	1 year	21 minutes	2
	A3	Associate 1	Female	2 years	24 minutes	3
Clients	C1	Accountant	Male	6 years	11 minutes	1
	C2	Accountant	Male	6 years	15 minutes	1
	C3	Finance Manager	Female	7 years	10 minutes	1

Source: Author Constructed

During the face-to-face interviews, the participants were given a copy of the interview guide to ensure sufficient coverage of the research aim and the optimal use of time. All the interviews were voice-recorded with prior permission from the participants.

To ensure that the privacy of each individual and firm is protected, all names including the firm and their workflows are anonymised throughout this research report.

4 ANALYSIS AND DISCUSSION

4.1 Data Analysis

Thematic analysis was used to analyse the interview data. Thematic analysis is a technique used in qualitative research to analyse the verbal data collected (Betti & Sarens 2020). The thematic analysis process introduced by Braun and Clarke (2006) was followed during the analysis. The results of the thematic analysis are summarised in Table 2.

Table 2: Summarisation of Thematic Analysis

Theme	Sub-theme	Items	Verbatim extracts
T1. Digitalisation and ABC firm	T1.1. Digital technologies applied	Big data analytics Cloud-based software MS 365 IDEA Sentinel Oracle	“Now only we are thinking about big data and analysis” “...enhanced and introduced cloud-based AP2 software “...Microsoft Excel for performing workings and IDEA for sampling” “We use MS Teams for communication” “We have a cloud-based software called Sentinel” “The Oracle system is used for billing”
	T1.2. Means used to implement digital technologies	For risk assessment For analytical procedures For documentation For sampling	“In risk assessment procedures, to generate world check reports, we have a separate software” “The same facilities for analytics are built into AP2 software” “We have moved towards one single platform to document everything” “For sampling, we used another software called IDEA”
T2. The scope of the external audit function	T2.1. Changes to scope	Reasonable assurance No change to the scope Importance given for operating processes	“We are doing the audit only to give a reasonable assurance” “For boundaries to change, the auditing standards should be changed by regulators” “The operating processes have been given equal importance”
	T2.2. Impact on cost, quality, speed, and service	No impact	“No change. No impact”
T3. Working practices	T3.1. Changes to working practices	No change to nature and timing Significant impact on extent Ability to create a model	“The timing and nature of the procedures have not changed” “AP2 itself indicates what minimum audit procedures we should perform” “Everything will be autosaved”

		Documentation concurrently with fieldwork AutoSaving	“We have to do the documentation concurrently when we are doing the audit” “The employees are given a chance to create a dummy and try out the audit procedures”
	T3.2. Impact on cost, quality, speed, and service	Increase in the cost Increase in the quality Increase in speed Improvement in the service	“We have a particular dollar amount to pay” “All the criteria to be met are there on the screen” “We give more focus on the reliability” “They have to do the right thing. Otherwise, the file cannot be closed out” “AP2 itself suggests minimum audit procedures” “No difference in tangibility, reliability, and assurance. Responsiveness has improved” “A small decrease in the time consumed by auditors” “We are closing those out in 14 days” “Any team member can access it quickly” “We have been able to identify numerous defects in controls” “Client can get insights”
T4. Skills gap	T4.1. Impact on the skills gap	Ability to interpret Training is ineffective Recommendations	“Most people don't have that ability to interpret” “The time they have allocated is not enough” “Not that much data analytics” “The training should be organised frequently” “Physical sessions would be better”
	T4.2. Impact on cost, quality, speed, and service	Increase in the cost Decrease in the quality Decrease in the speed Deterioration in the service	“It will impact to increase costs and decrease quality, speed, and service”

Source: Author Constructed

4.2 Findings

4.2.1 Digitalisation and ABC firm

Digital technologies applied: Several trends in digital technologies can be observed within the context of the business environment, including big data, data analytics and blockchain technology (Dagiliene & Klovienė 2018). Among these, big data and analytics have been integrated by ABC firm into their AP2 software, which is utilised to document audit procedures under the AP2 workflow. Other technologies have yet to be incorporated into the auditing workflow.

A Project Manager of this firm said (Int. M2):

“In terms of our industry, I would like to focus on big data. Other things are not used that much currently. Here, in AP2, this is an all-in-one platform. Data analysis can also be considered a main task that we, as auditors, must perform during our audit procedures. AP2 has advanced capabilities like journal entry analysis, sampling, and predictive analysis related to big data analytics.”

However, an Associate Director of ABC firm expressed concerns regarding the current state of digitalisation as (Int. M1):

“I think we are still not fully immersed in digitalisation. We are only beginning to consider big data and analysis. At the moment, we have software, but these are not yet fully integrated. Even though new software has been developed globally, it is not utilised in the Sri Lankan context. Implementing these technologies poses challenges for trainees, as they may not possess the necessary skills during their first two years. By the time they gradually improve, many tend to resign. Furthermore, there is a readiness issue in client companies”

As every informant indicated, the AP1 software used in the AP1 workflow had to be installed on individual laptops and required a connection to a virtual private network to access files. Without this connection, audit files could not be accessed. In contrast, AP2 has emerged as cloud-based software that can be accessed from anywhere without the need for a private network. Int. M2 stated:

“The advantage of AP2 is that it is cloud-based. The previous software required a connection through a private server, which was difficult to manage and often led to interruptions. Now, we can simply connect to the internet and use it.”

In addition to AP2, other tools such as MS 365, IDEA software, Sentinel system, and Oracle system are utilised in the auditing process. An Audit Associate stated (Int. A2):

“Currently, we primarily use three tools: Microsoft Excel for calculations, AP2 for documentation, and IDEA for sampling and data analysis.”

Means used to implement digital technologies: The digital technologies discussed are employed at every stage of the audit process. Int. M1 explained:

“We can use these technologies at the planning level, testing level, and completion level. Before commencing an audit with a client, it is verified whether the firm is independent of the client company and whether there are any risks associated with starting an engagement. If any key management personnel have been involved in corruption or other crimes, the engagement will not be accepted.”

At the planning stage, the firm generates two reports called “Sentinel”. Furthermore, a form called “Know Your Client” is prepared, which requires generating another report known as the “World-Check Report.” Various software tools are utilised for these actions. Int. M1 stated:

“In risk assessment procedures, to generate World Check reports, we have a separate software. After that, we have a cloud-based software called Sentinel. It is used to see whether we can accept the audit globally.”

After completing these preparatory steps, auditors perform analytical procedures. Under the AP2 workflow, auditors are not required to engage in separate software for analytics, as the necessary tools are integrated into the AP2 software. Int. M1 stated:

“The analytical procedures we can perform are not limited to standard variance analysis. We can set expectations for interest income and conduct analyses accordingly. Previously, we used IDEA for analytical procedures, but now those capabilities are built into AP2 software.”

Documentation has also evolved, with all documentation now being completed in a single file created within the AP2 software. Int. M2 stated:

“We have transitioned to a single platform for documentation. At the end of the day, we have only one file.”

However, while branches of ABC firm in other countries utilise AP2 to allow clients to upload supporting documents, this feature is not yet available in Sri Lanka. Another Project Manager of this firm noted (Int. M3):

“In Australia, clients can directly upload supporting documents to our files without needing to send emails. This shift allows for seamless interaction.”

The integration of digital technologies extends to sampling as well. Although IDEA software was previously used to select samples in the AP1 workflow, this functionality is now built into the AP2 software. Int. M2 remarked:

“In AP2, we can perform sampling directly within the software, eliminating the need for an additional platform.”

4.2.2 The scope of the external audit function

Changes in the scope: The overall objective of an independent auditor is to provide reasonable assurance rather than absolute assurance (International Auditing and Assurance Standards Board 2007). This principle sets the boundaries for the scope of the external audit function. According to the informants, the scope of the external audit function remains unchanged as long as the audit standards are not amended by regulators. Int. M1 stated:

“We cannot conduct a 100% audit. That is the maximum level we can achieve, but it is not feasible. This is also permitted by auditing standards. Additionally, we are not entirely responsible for detecting fraud. When we begin an audit, we assume that management has conducted their operations correctly. If it is evident that management has not acted appropriately, there is no need for an audit. Moreover, the boundaries are established by auditing standards. For any changes to occur, the auditing standards must be modified by regulators. Hence, there is no change in the scope.”

However, in contrast to the AP1 workflow, the AP2 workflow places greater emphasis not only on the financial reporting process but also on other operational processes to identify potential risks. Int. M2 noted:

“The operating processes are now given equal importance, resulting in higher documentation requirements.”

Impact on the cost, quality, speed and service: Since there has been no change to the scope of the external audit function, the impact on KPIs such as cost, quality, speed, and service is negligible. Int. M1 stated:

“The scope remains the same, so there is no significant impact on cost, quality, speed, or service. We continue to provide the same level of assurance to our clients.”

4.2.3 Working practices

Changes to working practices: The results of the thematic analysis indicate that digitalisation has significantly transformed working practices. The primary change is the transition from AP1 software to AP2 software for documentation. Furthermore, the impact on the nature, timing, and extent of audit procedures performed has become a mandatory consideration. The nature, timing, and extent are the main elements of any audit procedure. The auditor shall design and perform further audit procedures whose nature, timing, and extent are based on and responsive to the assessed risks of material misstatement at the assertion level (International Auditing and Assurance Standards Board 2009).

According to the informants, the nature and timing of procedures have not changed significantly due to the workflow shift resulting from digitalisation. Int. M1 explained:

“In terms of nature, I do not see a drastic change. The nature refers to whether we are performing tests of details or substantive analytical procedures. With AP2, we now have a minimum requirement for substantive procedures, whereas previously, that focus was not as pronounced. Other than that, there has been no change in nature. Timing refers to whether we perform audit procedures at the interim level or year-end, and there has been no change in timing.”

An Audit Associate of the firm added (Int. A1):

“For common audit procedures such as control procedures and substantive procedures, we perform them in the same manner as we did in the AP1 workflow. Therefore, the nature of the audit procedures has not been impacted.”

However, the extent of audit procedures has been affected due to the workflow change. The AP2 software now automates sampling, minimising the risk of over-sampling or under-sampling. Int. M1 stated:

“Extent refers to the quantity of evidence we collect, such as sample size. In AP2, there are proper guidelines for logically selecting samples, and the software itself can perform sampling. This eliminates the risk of over- or under-sampling.”

Furthermore, auditors are now allowed to create a model file in the AP2 software to practice procedures until they become familiar with them. Int. M2 explained:

“Employees have the opportunity to create a dummy file and practice audit procedures. If that process is satisfactory, we can proceed to the production phase. We initiated this in March 2021. Earlier, we were at 25%, then 50%, and now we are at 75% implementation of this platform. We expect to reach 100% in the upcoming year.”

Importantly, auditors must document their work concurrently with fieldwork, as they are not permitted to take more than 14 days to close a file after issuing the audit report. In contrast, the previous workflow allowed auditors ample time for documentation even after the audit report was issued. Int. M2 stated:

“We must document concurrently while conducting the audit.”

Additionally, in the previous AP1 software, auditors had to manually save their work after completing each screen. In contrast, the cloud-based AP2 software automatically saves all documentation. Int. M2 explained:

“In the previous version, we had to document and manually save something. Now, since AP2 is cloud-based, everything is auto-saved. Even if your browser crashes, when you reload it, what you are typing will still be there. It is user-friendly, with filtering options and project plans. When we assign deadlines, notifications and reminders are sent.”

Impact on the cost, quality, speed, and service: The cost has increased due to the fees charged by the global headquarters for the AP2 software. The cost rises with the number of files opened and the number of users added to each file. Int. M1 stated:

“We need to spend more since we have a specific dollar amount to pay for each file we open. Therefore, the cost has increased.”

Int. M2 remarked:

“The costs are significantly higher. We have to pay a fee to the global head office, and data charges are also elevated.”

Int. A1 added:

“When we were using AP1, costs were relatively lower. With AP2, we must pay in dollars to our global head office. Given the current currency rates, costs have doubled, making it very expensive.”

In contrast, the quality of audits has improved for several reasons. The ability to view the company's overall picture, the guidance and criteria available on each screen of the software, and the enhanced reliability from prompts on information collection all contribute to this improved quality. Int. M1 stated:

"The main benefit is that we can see the company's overall picture. For smaller audits, we can perform traditional procedures and still gain insights."

Int. M1 also noted:

"Quality has also increased. For example, when performing procedures for estimates, all criteria that must be met are displayed on the screen. No one can skip those steps, highlighting the importance of thorough documentation."

According to Ismail et al. (2006), audit service quality can be measured using four dimensions: tangibility, reliability, responsiveness, and assurance. Tangibility refers to the physical appearance of the audit firm, including available facilities. Reliability pertains to the ability of the audit staff to perform promised services accurately and timely. Responsiveness refers to the willingness of the audit staff to assist clients and provide prompt service. Assurance conveys trust and confidence.

From the clients' perspective, the dimensions of tangibility, reliability, and assurance have remained consistent since the introduction of the AP2 workflow, but responsiveness has improved. A client of ABC firm, who is working as an Accountant stated (Int. C1):

"There is no significant change in tangibility, reliability, and assurance. However, responsiveness has increased. The interaction between auditors and our company has improved, and the audit team is much faster now."

Both auditors and clients interviewed noted an increase in speed. The primary reason cited by manager-level auditors is the requirement to close files within 14 days after issuing the audit report. Additionally, the ease of accessing files in the AP2 software has contributed to this increased speed. Int. M1 explained:

"Some clients previously provided minor information after the issuance of the audit report. However, this is no longer possible, as AP2 does not allow changes to working papers after the report is issued. Now, we must close files within 14 days. Initially, this may be challenging, but once accustomed to the process, it becomes more manageable."

4.2.4 Skills gap

Impact on the skills gap: According to the informants, the skills gap has been enlarged a little by the circumstances created by the AP2 workflow and the lack of training. As the audit managers said, the auditors lack the analytical and interpreting skills that are much needed in the AP2 workflow. Int. M1 stated:

"With the analytical tools inbuilt into the AP2, auditors should possess the ability to interpret. But they don't have that ability."

Int. M2 added:

"Skills like analytical skills are needed."

Contrary, auditors have come across several issues in the implementation of the AP2 workflow. Additional pressure, inability to adjust to the complexity, and lack of proper training are the main concerns raised by the associate-level auditors. Int. A2 explained:

"Next thing is that after we add a Process Risk Point (PRP), we cannot remove it. So many popup messages come out. And it takes so much time to correct. It makes a lot of trouble. It is a waste of time."

Int. A1 expressed concerns about the training, stating:

"I don't think trainings are enough. When someone joins ABC firm, they would just arrange 5 days of training and it is a tough schedule. And it is hard to absorb things that fast. When it comes to my training, I was an intern for 6 months and then I joined as a trainee. There it was not that hard for me but for other newcomers it was hard. And usually when it comes to other organisations give more pieces of training. For example, my friends who joined other banks and organisations tell me that they were provided with nearly one or two months of training."

In particular, training has not covered any analytical skills sufficiently. Int. A1 noted:

"They teach only the documentation ways. Not that much data analytics."

Informants, especially the associate-level auditors, came up with some suggestions to make the training efficient and effective. Organising trainings frequently, increasing the number of sessions, using well-experienced staff to teach and conduct the sessions, and arranging physical training rather than virtual training are the main suggestions they came up with.

Impact on the cost, quality, speed, and the service: The analysis indicated that while the workflow changes led to several positive outcomes, the resulting skills gap has adversely impacted cost, quality, speed, and service. Int. A1 stated:

"Definitely, it will increase costs and decrease quality, speed, and service."

Additionally, Int. A2 remarked:

"The lack of proper training means that we often struggle to meet deadlines, which ultimately affects the quality of our work and client satisfaction."

The findings indicate that the skills gap created by the implementation of the AP2 workflow has negatively impacted the audit firm's performance in terms of cost, quality, speed, and service. This is consistent with prior research suggesting that the lack of necessary skills among auditors can lead to decreased audit quality and efficiency (Betti & Sarens 2020, Liew et al. 2022). The findings highlight the importance of providing comprehensive training to auditors to ensure they possess the required analytical and data interpretation skills to utilise the new technologies introduced by the AP2 workflow effectively.

4.3 Discussion

The analysis presented above, and the findings reveal how the change in workflow has affected the scope of the external audit function, working practices, and skills gap, and how those changes impacted KPIs such as cost, quality, speed, and service to determine the success or failure of the BPR attempt.

Firstly, the findings indicate that ABC firm has embedded only big data and analytics into the AP2 software, while other digital technologies like blockchain are yet to be adopted. This is consistent with the trends observed in the business environment, as highlighted by Dagiliene and Kloviene (2018). Apart from these, the firm is utilising MS 365, IDEA software, Sentinel system, and an Oracle system.

Secondly, digital technologies are employed for planning activities, risk assessment procedures, analytical procedures, testing work like sampling, and documentation. This aligns with the assertion made by Attaran (2003) that technological advancements are crucial for BPR, as they create value through integration with customers and suppliers.

Thirdly, the findings indicate that the scope of the external audit function has not changed due to this transformation. This suggests that the boundaries set by auditing standards, as discussed by the International Auditing and Assurance Standards Board (2007), remain intact.

Moreover, since there is no change to the scope, the impact on cost, quality, speed, and service is negligible. This finding contradicts the BPR metrics proposed by Hammer (1990), which emphasise dramatic improvements in critical performance measures such as cost, quality, service, and speed.

Further, the results indicate that working practices have changed significantly. Even though the nature and timing have not changed, the extent of audit procedures has been affected due to the AP2 software's ability to avoid over- or under-sampling. This finding aligns with the International Auditing and Assurance Standards Board's (2009) assertion that the auditor shall design and perform further audit procedures whose nature, timing, and extent are based on and responsive to the assessed risks of material misstatement at the assertion level. The findings also suggest that all four KPIs have been positively affected by the changes in working practices. This validates the prior literature on BPR, which emphasises that technological advancements make BPR a success (Hammer 1990).

The skills gap has been enlarged due to the AP2 workflow and lack of training. Auditors have faced issues such as additional pressure, inability to adjust to complexity, and lack of proper training. This finding is consistent with the research by Betti and Sarens (2020) and Liew et al. (2022), which suggests that the lack of necessary skills among auditors can lead to decreased audit quality and efficiency. Even though other changes seemed positive, the impact of the skills gap negatively affected cost, quality, speed, and service. This highlights the importance of providing comprehensive training to employees to ensure they possess the required skills to effectively utilise new technologies introduced through BPR initiatives. If management fails to do so, the BPR attempt may become a failure, as emphasised by Hammer (1990).

In summary, while the changes to working practices positively impacted KPIs, the skills gap created by the AP2 workflow and lack of training negatively affected the firm's performance.

This underscores the critical role of employee skills in the success of BPR initiatives, as supported by literature.

4 CONCLUSION

This study employed qualitative research methodology and a case study approach, focusing on ABC firm, to investigate the impact of digitalisation on the external audit function and its implications for BPR. The main objective was to explore how the scope of the external audit function has changed with digitalisation, analyse the changes in working practices within audit firms, assess the extent and implications of the skills gap created by digitalisation among external auditors, and investigate the influence of digitalisation-driven technological advancements on the success of BPR initiatives in audit firms.

The findings indicate that ABC firm has embedded only big data and analytics into the AP2 software, with other digital technologies, such as blockchain, yet to be adopted. In addition to these technologies, the firm utilises MS 365, IDEA software, Sentinel system, and Oracle system for various activities, including planning, risk assessment, analytical procedures, testing work like sampling, and documentation. The limited adoption of digital technologies reflects the challenges faced by audit firms in developing countries, where the integration of advanced technologies can be hindered by resource constraints and a lack of skilled personnel (Liew et al. 2022).

Crucially, the findings suggest that the scope of the external audit function has not changed as a result of this transformation. Consequently, since there is no change to the scope, there is also no impact on the cost, quality, speed, and service provided by the firm. This aligns with the assertion made by the International Auditing and Assurance Standards Board (2007), which emphasises that the fundamental objectives of an audit remain constant unless regulatory changes occur.

However, the results indicate that work practices have changed significantly. Although the nature and timing of audit procedures have remained consistent, the extent of audit procedures has been affected due to the AP2 software's ability to avoid over- or under-sampling. This finding is consistent with the International Auditing and Assurance Standards Board (2009), which states that auditors must design and perform procedures that are responsive to the assessed risks of material misstatement.

The findings also reveal that all four KPIs: cost, quality, speed, and service have been positively affected by the changes in working practices. This supports existing literature on BPR, which emphasises that technological advancements are critical for successful BPR initiatives (Hammer 1990). However, the study also identified a significant skills gap that has been exacerbated by the AP2 workflow and a lack of adequate training. Auditors reported facing additional pressure, difficulty adjusting to the complexity of the new system, and insufficient training, which aligns with previous research indicating that a lack of necessary skills can lead to decreased audit quality and efficiency (Betti & Sarens 2020).

The negative impact of the skills gaps on cost, quality, speed, and service underscores the importance of providing comprehensive training programs to ensure that employees are equipped with the necessary skills to navigate the digital landscape effectively. As highlighted by prior literature, without proper training and support, the potential benefits of technological advancements may not be fully realised, leading to ineffective BPR attempts (Hammer 1990).

To address these challenges, several recommendations can be made at both the policy and managerial levels. At the policy level, CA Sri Lanka should develop comprehensive training programs focused on digital skills and data analytics for auditors, promote the adoption of a broader range of digital technologies, establish regulatory frameworks to encourage digital integration and facilitate collaboration between audit firms and technology providers.

At the managerial level, audit firms should invest in ongoing training and development for their staff, create a supportive environment that encourages learning, enhance communication with clients regarding digital tools, implement feedback mechanisms, and encourage cross-functional training. These recommendations aim to bridge the skills gap and ensure that auditors are well-prepared to meet the demands of an increasingly digitalised audit environment.

Moreover, the study extends the existing literature on audit practices by exploring how BPR impacts auditing processes within firms. It provides empirical evidence on the relationship between BPR initiatives and audit effectiveness and efficiency, adding depth to the understanding of how process improvements can influence audit quality, cost, speed, and service. This integration offers a new perspective on how firms can enhance audit practices through radical process changes.

This study has limitations that should be acknowledged. First, the qualitative nature of the research means that the findings cannot be generalised across the industry. Administering a questionnaire to a larger sample of accounting and auditing firms would contribute to the generalisability of the findings.

Second, the research primarily considered the perspectives of managers and staff within the audit division, neglecting the viewpoints of personnel in other divisions. Additionally, only the auditing process has been examined in the context of BPR, while other processes and services within an accounting firm remain unexplored. Future research could investigate these aspects as well.

Third, the divergence between the Big Four audit firms and other audit firms regarding the impact of digitalisation has not been addressed. Future studies could incorporate a quantitative approach to compare the experiences of Big Four firms with those of smaller firms in terms of digitalisation and BPR. Further, the institutional and firm-related factors influencing the decision to adopt or reject digital technologies have not been investigated. Furthermore, other critical success factors beyond IT were not considered in this study. Factors such as top management commitment, leadership, changes in management systems, and a collaborative working environment may also play significant roles in the success or failure of BPR initiatives.

Finally, future research could explore the differences in changes to practices across various countries in light of digitalisation. Additionally, conducting a cost-benefit analysis of BPR, which has not been discussed in this research, would provide valuable insights for practitioners and scholars alike.

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