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eXtensible Business Reporting Language Data Assurance Challenges and Strategic Approaches: A Study in the Malaysian Business Reporting System Context

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Abstract

The eXtensible Business Reporting Language (XBRL) functions as an independent, open platform that facilitates efficient information transmission over the Internet, improving business information utilization. Despite its widespread adoption and numerous benefits, unresolved assurance issues undermine its effectiveness, revealing a significant research gap. This study explores the complex landscape of XBRL data assurance challenges within the Malaysian Business Reporting System (MBRS). Utilizing a qualitative case study methodology, the research highlights key challenges in XBRL data assurance and presents strategic, innovative solutions. Through semi-structured interviews and document analysis, insights from diverse stakeholders are captured, revealing the development of artificial

intelligence-enhanced audit software aimed at improving the quality of XBRL filings in Malaysia. Despite its potential, awareness of this advanced software among preparers remains disappointingly low. This research serves as a valuable resource for practitioners and researchers, offering an in-depth analysis of XBRL data assurance challenges and pioneering solutions, thereby making a significant contribution to this critical field.

Keywords: XBRL, Data Assurance Challenges, Malaysian Business Reporting System (MBRS), Stakeholder Insights, Artificial Intelligence (AI).

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Introduction

The emergence of disruptive technologies has significantly transformed the field of accounting, particularly in the context of financial reporting technology (Fernandez & Aman, 2018; Fernandez et al., 2024). In this era of digitization, the eXtensible Business Reporting Language (XBRL) has become a revolutionary tool for enhancing the efficiency and accuracy of business reporting. XBRL facilitates the electronic communication of business and financial data globally, ensuring transparency and consistency, and making data more accessible and reliable. Despite its widespread adoption, the application and assurance issues of XBRL in specific contexts, such as the Malaysian Business Reporting System (MBRS), remain underexplored. The MBRS, initiated by the Companies Commission of Malaysia (CCM), is a digital submission platform that enables the electronic submission of Annual Returns (AR), Financial Statements (FS), and Exemption Applications (EA) in XBRL format (Uyob et al., 2023). The introduction of MBRS represents a significant shift toward a more automated and streamlined business reporting process in Malaysia, aligning with global trends in digital financial reporting (Ahmi et al., 2019). However, this transition is not without challenges, particularly concerning data assurance in XBRL filings.

Despite the advantages offered by XBRL, past research has unearthed flaws, discrepancies, and potential assurance challenges within XBRL submissions. Consequently, these errors riddled XBRL documents have become a significant source of concern for a wide range of stakeholders. The available evidence strongly indicates that quality issues persist within these submissions, warranting ongoing attention and scrutiny. Previous research has brought attention to concerns about data integrity, which exist and can potentially lead to errors or fraud (Debreceny et al., 2020; Hoitash et al., 2021). Lidia (2020) further claimed that XBRL information contains errors and diminishes data quality in financial statement

submissions to regulators. The effectiveness of XBRL in the MBRS context is crucial for ensuring the reliability and quality of business reporting in Malaysia. Understanding the assurance challenges and identifying strategic solutions within this specific setting is imperative for optimizing the benefits of XBRL, and contributing to the enhancement of business reporting standards in the country. This research is poised to explore these dimensions, offering insights and recommendations for addressing XBRL data assurance challenges in the MBRS context, thereby contributing to the advancement of digital business reporting in Malaysia.

Assurance measures are critical for ensuring that the information uploaded through the XBRL platform is accurate and free from errors. The accountant responsible for this task is assumed to be capable and possess sufficient technical accounting knowledge. In a recent study conducted in the United Kingdom (UK), Lidia (2020) found that concerns about the level of assurance needed when auditing the integrity of digital reporting were raised by 11 out of 17 respondents. Regulators and industry experts recognized the need to explore alternative technological solutions to address these emerging concerns. Consequently, the demand for Inline XBRL (iXBRL) technology began to gain traction as a direct response to the evolving landscape of assurance issues within the XBRL framework. As a result, UK regulators transitioned from XBRL to iXBRL, which provides enhanced assurance features and is considered an improvement in addressing assurance challenges compared to the previous XBRL system. However, this study focused on the implementation of iXBRL in the UK context, which is more advanced than XBRL adoption in Malaysia. Although Ilias et al., (2021) emphasize the significance of XBRL data assurance in ensuring authenticity and fostering confidence in financial information submissions, empirical evidence and strategic solutions in the Malaysian context still need to be more extensive. Therefore, the assurance of data quality issue seems relevant to future XBRL implementation in Malaysia. This current study aims to investigate the challenges related to XBRL data assurance and propose strategic solutions to address them from the Malaysian unique scenario. It is more conducive for exploring a phenomenon with little previous knowledge when XBRL implementation was not fully mandated by the regulator, considering Malaysia as a unique case. Section 2 delves into the literature review on XBRL assurance, followed by Section 3, which discusses research findings. Finally, Section 4 concludes this study by emphasizing the implications and future directions in addressing XBRL data assurance issues in the Malaysian context.

Literature Review

The Adoption of XBRL as Digital Reporting

The scope of this XBRL study is to focus solely on the context of CCM as the choice of this specific context is deliberate, where CCM holds a vital role as the pioneering regulator in Malaysia's digital reporting landscape among a wide array of business entities in Malaysia.

CCM has developed a 2-tier taxonomy proposed in the XBRL reporting format for use by Malaysian companies called the MBRS. The first is a taxonomy for financial statements by public companies and their subsidiaries, associates of or jointly controlled, based on specifications in the Malaysian Financial Reporting Standard (MFRS). Meanwhile, the second one is the taxonomy for private companies based on specifications by the Malaysian Private Entities Reporting Standard (MPERS). The use of MBRS has become mandatory for AR since September 2018, while the submission of FS and EA remains voluntary until a later announced date.

Based on MBRS requirements, there are dual roles of preparers upon the submission of XBRL files that are lodger and maker. The Company Secretary of an organization plays an essential role as a lodger who has the right to submit the XBRL document in the MBRS portal. Concurrently, the maker, often an Accountant acts as an Assistant to the Company Secretary and is entrusted with the preparation of the XBRL document for submission. Both roles, although distinct, operate in tandem to ensure the seamless handling and submission of essential documents. Therefore, the responsibility of keying in the correct information into the XBRL system now lies with the MBRS lodger and no longer with the CCM personnel as previous practice through submissions made over the counter. Any wrong information submitted by the preparers will be penalized by the CCM (SSM, 2020).

In the newly introduced system, the responsibility of submitting the XBRL zipped file to regulatory bodies falls solely on company secretaries, regardless of their level of accounting proficiency. However, many of these company secretaries face challenges in this process, primarily due to their limited background in accounting practices. This lack of understanding, particularly when inputting financial data into the platform, significantly increases the risk of errors in the submissions. Unfortunately, these errors have the potential to raise data assurance concerns within the XBRL files uploaded to the MBRS platform (Ilias et al., 2020; Uyob et al., 2019). It is crucial to recognize that these errors may originate from the preparers themselves, highlighting the need for proactive measures to address them. These measures should focus on improving both accuracy and compliance throughout the XBRL submission process, particularly within the framework of the MBRS.

The XBRL Data Assurance

The purpose of XBRL assurance is to ensure the integrity of the information in XBRL-based documents, and assertions must comply with XBRL taxonomy, a requirement stipulated by regulatory bodies. The notion of XBRL assurance was first highlighted by Boritz and No (2008), who elaborated on errors made during XBRL filings. Equivalent to the management assertions for financial audits, Srivastava and Kogan (2010) emphasized that the assurance process for XBRL-instance documents would be ad hoc and inconsistent without a proper conceptual framework for assurance.

A framework of assertions for providing assurance on XBRL-instance documents, along with a tagging process, has been developed to fill the research gap (Plumlee & Plumlee, 2008) and to enhance AICPA guidelines. However, the framework introduced by the study has been criticized for being overly complex, and auditing the tagging process may receive more attention than warranted (Trites, 2010). Trites (2010) further argued that future audits should focus on individual items, such as data-level assurance, the content of the assurance report, and the method of reporting, rather than solely on the tagging process. A comprehensive XBRL assurance, akin to a financial audit, is impractical due to its complexity, time demands, and high costs. However, Trites agreed that Agreed-Upon Procedures (AUP) on selected XBRL taxonomies should be conducted as part of the assurance requirement. In summary, external XBRL assurance provisions must adopt a model similar to modern financial auditing. The focus on the process that transforms a financial statement from paper form into an XBRL filing suggests that if XBRL assurance is to be effective, it must shift from assuring each individual XBRL filing to concentrating on the mechanism that performs the conversion.

Concern about assurance includes the nature and degree of such assurances, lack of guidance, definition of XBRL filing errors, materiality, and techniques, as well as procedures for provid-ing assurance. These should be theoretically identical in content to the original reports and tra-ditional HTML filings, and there is no mandate that these filings receive any form of assurance from the external auditor. Therefore, two different sets of report formats exist: one audited us-ing the HTML or PDF format and the other using the XBRL format distributed to the regulator. For XBRL to be a useful tool for users of business information, the data contained in XBRL files must be reliable and accurate. In producing accurate, highly reliable, and high-quality da-ta, the assurance element is paramount. Debreceny et al. (2020) agreed that assurance of XBRL data disclosed to stakeholders is highly demanded, where the financial statement published in XBRL-tagged data is relevant, complete, accurate, and fairly presented in the auditor's opinion to render it reliable. In some developed countries, XBRL assurance is mandatory. For example, in the Netherlands, an XBRL-instance document audit for financial reporting submission to regulators has been mandated since 2016 (Geijtenbeek, 2017).

Challenges for XBRL Data Assurance

The absence of assurance for XBRL filings could potentially increase litigation risks for auditors and lead investors to place excessive reliance on unaudited XBRL data (Hoitash et al., 2021). They suggested that researchers persist in investigating the advantages and disadvantages of assurance, including audits of particular tag characteristics, tag utilization, or the overall preparation process. Furthermore, the absence of data assurance enforcement hinders preparers' efforts to audit XBRL-tagged data, which consequently leads to data quality issues. XBRL adoption and implementation will not become widespread until the current problem of data quality is resolved, as it is crucial for better-informed decision-

making processes. Hoitash et al. (2020) have consistently found that, up until today, no mandatory form of assurance from the external auditor is required for interactive XBRL filings forwarded to U.S. regulators, namely the Securities and Exchange Commission (SEC). They further claim that, due to the absence of a mandatory requirement for XBRL data to be audited, the submission of financial information in XBRL format will most likely contribute to errors in XBRL data and create risks associated with using XBRL. Consequently, the low demand for assurance by preparers is due to the absence of regulatory penalties.

This view is consistent with Perdana (2016), who argued that the data quality issue remains un-resolved as it requires regulatory commitments. However, Janvrin and No (2012) claimed that, due to liability concerns, auditors are not interested in assuring XBRL submissions as well as the XBRL process. Conversely, Zailani (2018) further argued that if the enforcement of data assurance by the auditor is made mandatory in XBRL implementation in Malaysia, the addi-tional compliance costs borne by preparers will become a burden. Meanwhile, the preparation requires providing a sense of comfort or assurance that the information in the audited financial statements has been properly tagged and uploaded into the MBRS platform. Nevertheless, this study does not provide empirical evidence on users' experiences in the XBRL data assurance context. Similar to the Malaysian context, due to the absence of auditing requirements and standards for XBRL, practitioners have raised concerns about whether data provided in the XBRL format is reliable and free from errors compared to the manually uploaded (human) ver-sion (SSM, 2020).

Lack of Software Embedded with XBRL function for XBRL Data Assurance

In the context of MBRS, it is notable that many company secretaries primarily utilize corporate secretarial software and have limited familiarity with accounting software due to their constraints in accounting knowledge. The readiness of the market plays a pivotal role, as the adoption of XBRL depends on market dynamics and demands. It is essential to recognize that the perceived lack of awareness surrounding XBRL among preparers in Malaysia stems from the absence of significant demand for XBRL technology within the practitioner community. Potential measures to address this issue may include allowing additional time for the preparation of financial statements in the XBRL format, making data freely accessible for future use, and providing incentives for the acquisition of accounting software equipped with the CCM taxonomy. If these incentives were offered, preparers would be more inclined to acquire accounting tools and software.

Perdana et al. (2019) highlighted that assurance control measures for taxonomy selection, formatting, and editing must be embedded in accounting software to mitigate or avoid errors. However, a common obstacle is related to software tools and their technical issues. In Singapore, a few companies provide accounting software with embedded XBRL GL. A recent study claimed that the lack of experts in the XBRL system, the need for various efforts, and

the lack of required hardware and software are among the barriers to XBRL implementation by Jordanian organizations (Qushtom, 2021). However, this study focused on decision-making tools used by users rather than discussing assurance issues among practitioners in greater detail. Janvrin and No (2012) claimed that accounting software containing XBRL is burdensome, as all three respondents who initially purchased bolt-on software reported information technology infrastructure problems, such as the need to change server settings to obtain the official XBRL taxonomy to load into the software. Additionally, the company needed to upgrade the memory on the target personal computer upon purchasing a stand-alone package. Finally, the company had trouble uploading information directly from its financial report into the newly purchased software.

Further, in the Australian context, Perdana et al. (2018) agreed that there is a lack of IT compa-nies providing accounting software embedded with XBRL taxonomy for preparers, particularly for small companies. They concluded that XBRL implementation in Australia has not occurred despite claims of significantly improved regulatory reporting efficiency, due to the lack of sup-port from software developers. Similarly, the Malaysian accounting professional body, the Ma-laysian Institute of Accountants (MIA), stressed that the lack of tools and software available in the market to help auditors carry out audits hinders XBRL implementation in Malaysia. As far as they are concerned, it is almost impossible to find an IT company that provides software packages incorporating XBRL functions in Malaysia. Ilias et al. (2021b) have pointed out a cru-cial aspect regarding the integration of XBRL tools and software into the MBRS platform. They noted that, in recent years, there has been a gradual emergence of software and tools equipped with XBRL functionality. However, it is important to highlight that software developers remain uncertain about the seamless integration of XBRL taxonomy into their software solutions, par-ticularly for the efficient preparation of XBRL-instance documents. It is worth noting that the interview conducted by Ilias et al. in 2015 and the landscape of XBRL development in Malaysia have continued to evolve. As a result, the exact status of XBRL integration into software tools and its overall development in Malaysia remains somewhat uncertain.

Methodology

This qualitative case study focused on the MBRS platform to achieve its objective. Given the exploratory nature of this study, a qualitative approach is deemed most appropriate as it allows for an in-depth exploration of the experiences of various stakeholders involved in the XBRL filing process (Creswell, 2013). This methodology permits the exploration of the complexity and specificity of the XBRL data assurance landscape in Malaysia, allowing for the identification of both the issues in data assurance and the potential strategic solutions to address these issues. Data collection included primary sources such as interviews with the regulator, preparer, industry expert, and software developer, as well as document reviews. The purposive sampling method was used to select participants for this research. Participant

selection was based on their potential to provide detailed data (Patton, 2002) and aimed to select specific units to produce the most relevant and rich data, as proposed by Yin (2003). Since the knowledge and evidence were contextual, the interview design involved a semi-structured question format to allow for flexibility in the study (Aman & Kasimin, 2011; Kasimin et al., 2013).

The diverse group of participants offered a unique perspective on XBRL implementation within CCM. Participant 1, a pioneer leader of the XBRL project at CCM, played a vital role in developing the MBRS system from the ground up. Participant 2, representing the preparer perspective, holds a dual role as a maker and lodger of submissions and serves as a council member in a professional body overseeing company secretaries. Furthermore, Participant 3, an industry expert and Assurance Leader at a Big 4 audit firm, actively contributes to CCM's taxonomy development and holds the esteemed role of a certified MBRS trainer. Finally, Participant 4, a software developer, has created audit software with integrated XBRL functionality for seamless file submissions via MBRS. These interviews, recorded and transcribed, along with document reviews, provide valuable insights into the challenges and strategic approaches derived from interviews conducted between 2022 and 2023. The interviews varied in duration and were meticulously recorded using voice recorders, and subsequently transcribed for analysis. In alignment with Creswell's (2013) recommendations, this study also incorporated documents including CCM websites, annual dialogues, and permitted handouts from developers as valuable data sources for a more comprehensive understanding of the research landscape. During the interviews, research notes were taken to record interpretations made when assembling the findings. Table 1 below presents the details of the interviewed participants.

Table 1. Participants in the face-to-face interview

Participant	Designation	Date	Duration	Code
Regulator	Leader of the XBRL team	26 August 2022	1 hour 15 min	Informant 1
Preparer	Company Secretary	3 February 2023	1 hour 7 min	Informant 2
Industry Expert	Head of Financial Services and Advisory	18 June 2023	1 hour 3 min	Informant 3
Software Developer	Chief Executive Officer	3 August 2022	1 hour 45 min	Informant 4

Based on Miles et al. (2015), descriptive coding was developed according to the researchers' understanding to fit the proposed study context and previous studies. This process offers coding accuracy as well as a clearer understanding of data from the multiple perspectives of the interviewees. The transcripts were uploaded to ATLAS.ti software version 9 for the first step, which is open coding. Figure 1 below illustrates a segment of the coding process using ATLAS.ti to ultimately arrive at the desired theme.

Figure 1. Coding process using ATLAS.ti

Source: Author

Subsequently, this process involved analyzing the collected data through the development of thematic patterns. It employed a methodology rooted in axial coding, followed by selective coding, guided by Corbin and Strauss (1995). These themes were not formulated in isolation; this research fortified them with references drawn from the extensive literature review. For instance, prior research has drawn significant attention to challenges related to data accuracy, as evidenced in the work of Fitri (2022). However, it becomes increasingly apparent that addressing data assurance issues necessitates regulatory commitments, as highlighted by Perdana (2016) and Qushtom et al. (2021). Despite the urgency of the matter, it is worth noting that a comprehensive software solution to address these assurance challenges is noticeably absent, reaffirming the conclusions drawn by Ilias et al. (2021b). The chosen theme was supported with references from the literature review, as depicted in Table 2 below.

Table 2. Sample of Coding for Analysis

	Definition and reference	**Coding**
XBRL Data Assurance Challenges	Data quality, validation, consistency, and the overall reliability of XBRL submissions (Hoitash et al. 2020)	• Data quality & integrity • Lack of regulation in XBRL data assurance
Lack of Software Embedded with XBRL Function	Limited availability of applications that have built-in capabilities to process financial data using the XBRL (Ilias et al. 2021b)	• Lack of expertise in software • Lack of demand in software XBRL data assurance

Results

The following subsections present the interviewees' viewpoints regarding data assurance issues from the perspectives of the regulator, preparers, and software developers. Based on previous literature, the researcher developed specific themes derived from the participants' practices as well as the shared documents. Discussions of the preliminary findings are presented in the following section.

XBRL Data Assurance Challenges

Present regulations do not mandate the assurance of XBRL submissions, and this could pose a substantial challenge to its practicality because of potential quality issues (Hoitash et al., 2021). They further claim that to fully harness the advantages that XBRL offers to the capital markets, regulatory bodies should contemplate making XBRL filings subject to assurance requirements. On the other hand, in the Netherlands, assurance of XBRL filings is mandatory (Geijteenbeek, 2017). He further supports arguments on auditing XBRL data by stating that if the regulator does not make the assurance compulsory, nobody will do it, since a mandatory requirement will lead to successful enforcement. However, in the Malaysian context, the regulator strongly believes that the system is reliable for detecting any errors; thus, no further mandatory assurance requirement is needed for the time being. They only rely on the algorithm set by the system; thus, no further checking is required, as highlighted by Informant 1:

"…I think no such thing of auditing or checking the information key in into the XBRL platform again. We trust the system because the system has the ability to detect errors and will not allow the preparers to proceed if they wrongly key in the figure and they can only click the submit button if the figures tally and is correct…"

Thus, the regulator believes that the information keyed into the XBRL platform is free from errors as the system immediately saves the information as long as the debit and credit amounts tally. However, Farewell and Pinsker (2015) argued that the information uploaded by humans may contain errors regardless of whether the amounts tally. Moreover, in the Malaysian context, the absence of XBRL auditing requirements and standards stipulated by the dedicated regulator has led to practitioners raising concerns about whether data provided in the XBRL format is reliable and free from errors. Informant 3 added the following:

"...of course we need to know whether the information in the XBRL platform is free from errors or not but if you ask an auditor out there they will definitely say they do not want to do redundant work. It's kind of double work when you have an audited copy, but you have to audit again. It can be considered as non-value-added activity. Why should we audit again the audited data, because the responsibility to submit lies with the company secretary as a lodger, not the auditor? So, if you look at the process, should another process be undertaken to ensure

that XBRL reporting, expect against audited financial statement. Unless SSM require company to do external audit on XBRL format then auditor will come to the picture to provide the service. That should be the way because the current way does not include that requirement, so nobody wants to do it. Whether that is to be done or not. Another option is rather than you go through that process is there a system solution that can translate numbers in the financial statement into XBRL format. Then someone has a good check whether it is correct. That's another option you have."

However, according to the regulator, the assurance issue should be tackled by other regulatory bodies too because it is presumed that regulating the external audit of an XBRL document falls under their jurisdiction. For example, their responsibilities are to encourage the preparers to use and become familiar with the XBRL submission platform called MBRS; however, the assurance should be introduced and enforced by other regulators, such as Bursa Malaysia or the Securities Commission, which is more powerful in monitoring and controlling entities, especially listed companies. It was further stressed by Informant 1 that:

"…I have to admit that assurance is really important, but it should not come from us, because we are not accounting professional bodies. All we do is prepare a platform for preparers to submit their financial reports in the XBRL format instead of the traditional PDF format. I think public-listed companies in Malaysia, they obliged and are more concerned with the requirements set by Bursa Malaysia or the Securities Commission. So, if the reports keyed into the XBRL format must be checked first to ensure the accuracy, the preparers will for sure listen to them not us…"

Lack of Software Embedded with XBRL Function

In the UK context, Alkhatib et al. (2019) found that small private companies are more likely to adopt SBR initiatives when they perceive benefits in using tools like web filing and commercial filing software. However, in the UK, the implementation has shifted to iXBRL, whereas in Malaysia, XBRL is still in use. Furthermore, in Malaysia, the development of a system solution to convert data found in financial statements into the XBRL format, as mentioned by Informant 3 earlier, has also been discussed in previous literature (Ilias et al., 2021b). They agreed that there are limited tools and software in Malaysia to ease the preparers' workload. However, the study does not provide empirical research and is uncertain about how the XBRL taxonomy can be embedded into the software to ensure the smooth preparation of the XBRL instance document. Therefore, there is a need to ensure that the XBRL taxonomy can be embedded in the accounting software. This software can facilitate the FS preparation and conversion of the report into an XBRL instance document before submitting it to CCM. However, the software developers need to ensure that the accounting software is aligned with CCM's XBRL taxonomy to assist the maker and lodger in the preparation of FS through the XBRL platform. Due to the triggers of the assurance issue, the

software developer took the initiative to convert the challenge into an opportunity. They developed software using an artificial intelligence (AI) function to overcome the issue of assurance in XBRL filing. This was mentioned by the software developer (Informant 4) regarding the auditing of XBRL data:

"...I was first aware of this data assurance issue on XBRL from the article issued by the accounting professional body, the MIA. From there I got the idea to come out with a solution for the assurance issue without employing human effort. Thus, I utilized AI as a solution embedded into my latest audit software. I was once an auditor, so I can feel the pain. Why should we burden humans if robots can do it for us? In the eyes of the auditor, they themselves have too much burden on audit and yet we want to squeeze their expertise to do checking of audited financial data (laughs). So, I came out with one solution to build an audit software function by clicking the validate button, and all the information keyed into the XBRL format will be automatically verified and checked, so it's free from error. Believe me, it's just by three simple clicks and way cheaper than hiring humans to audit for you."

Based on the interview with the participants, this study found that the XBRL function is more suitable if embedded into the audit software rather than the accounting software because financial information from the accounting software is yet to be audited while financial information from the audit software is basically audited information. However, regardless of the accounting software used by the preparers, the financial information saved as a PDF file extracted from the accounting software can be integrated into the audit software as well, but it requires basic configuration from the software developer. Since all the information from the audit software is fully automated through AI validation, it is unnecessary to manually key in the information again in the mTool template provided by CCM. By simply clicking the XBRL function, the software algorithm helps convert data from a standard PDF format into an XML-based XBRL format. This will ensure the accuracy of the information where a robot's work is more reliable than a human manually inputting the information into the XBRL platform. As the findings highlighted by Informant 4:

"… We acknowledged the issue of data assurance faced by the preparers while keying information into the XBRL platform because information processing remains highly manual, resulting in error-prone and time-consuming. Therefore, by using this audit software after the audit work is completed, the user can convert the PDF file into XBRL format and submit it to MBRS. I can say it is awesome when all users need to do is simply click the three simple steps instead of the headache of filling in manually into the SSM platform and believe it or not the cost is just RM50 per conversion. Using audit software is more suitable than accounting software. Because we prepare audited reports using audit software, once we complete the audit, this software is able to transform the file into XBRL format. No need to key or re-key into the MBRS platform. All we need to just upload the XBRL file to the platform. Because we learn from our Singapore experience. Convenient right?"

This finding contradicts Perdana et al., (2019), who stated that the XBRL function should be embedded in the accounting software (referring to the effort taken by the companies), however, the findings indicate that the Malaysian software developer has taken the initiative to embed the XBRL function into the audit software instead of the accounting software. This solution is presumed to be less time-consuming and cost-effective since per conversion will be charged RM50 instead of outsourcing the manual filing to an expert, which would cost clients up to RM500 per filing. This solution was also deemed to reduce the preparer's burden in terms of filing preparation to the regulator (CCM), as mentioned by Informant 2 below:

"… as for my client, I charge them roughly RM500 depending on the level of difficulty in doing their job. But the clients keep complaining to me that they have to incur additional costs rather than last time they submit over the counter only. I do not know whether the price is affordable, but my friend also charges a similar price..."

In contrast, Ilias et al. (2021) claimed that XBRL taxonomy can be embedded in the accounting software to facilitate the preparation and conversion of the financial statement into an XBRL instance document, and if the software is available in the market, its price would be very high. However, the researcher found that XBRL should be embedded into the audit software rather than the accounting software because a complete audit report generated from the audit software rather than the accounting software is an unedited financial statement. Findings also contradict previous literature, whereby the cost of using software is way cheaper compared to preparers doing it manually or outsourcing it to an expert. Informant 4 mentioned the following:

"… We are aware that nowadays audit software developers are brilliant, they can come out with reliable software in the market and updated based on the requirement of regulatory bodies. The taxonomy of XBRL was made an open taxonomy that any information will be made publicly available, and the taxonomies allow for extension. Like us, we have a connection with a programmer who worked in SSM, so they will update us if there are any changes in their latest version on the XBRL platform, mTool within 24 hours. That is our advantage, so we are aware of where and when to update our latest version of the software to be relevant in the market. We also collaborate with the Malaysian accounting body, the MIA as a platinum sponsor on events organized by them so they will help to promote our product to the preparers. Because you know accountant and auditor will be confident if you mentioned the MIA name…"

The findings of this study also shed light on the pivotal role played by the MIA in influencing preparers to adopt the newly introduced software and its functions. This aligns with previous research conducted by Aman and Mohamed (2017), who emphasized the regulatory influence of professional bodies on the adoption of digital tools within the accounting profession. MIA's proactive stance in promoting these innovations indicates the

broader shift toward embracing digital transformation in the accounting field. Building upon these insights, it is crucial to delve into the latest innovation in the concept of integrated automation, as illustrated in Figures 2(a) and 2(b). In the current landscape shown in Figure 2(a), the company secretary traditionally assumes the dual responsibilities of both lodger and maker of XBRL submissions. However, this approach exposes the process to various risks (Hoitash et al., 2020, 2021). These risks encompass inadvertent errors that may occur during manual data entry and the potential for intentional data manipulation to present inaccurate financial figures. Such vulnerabilities underscore the need for a more robust and automated approach to data submission, as proposed in Figure 2(b).

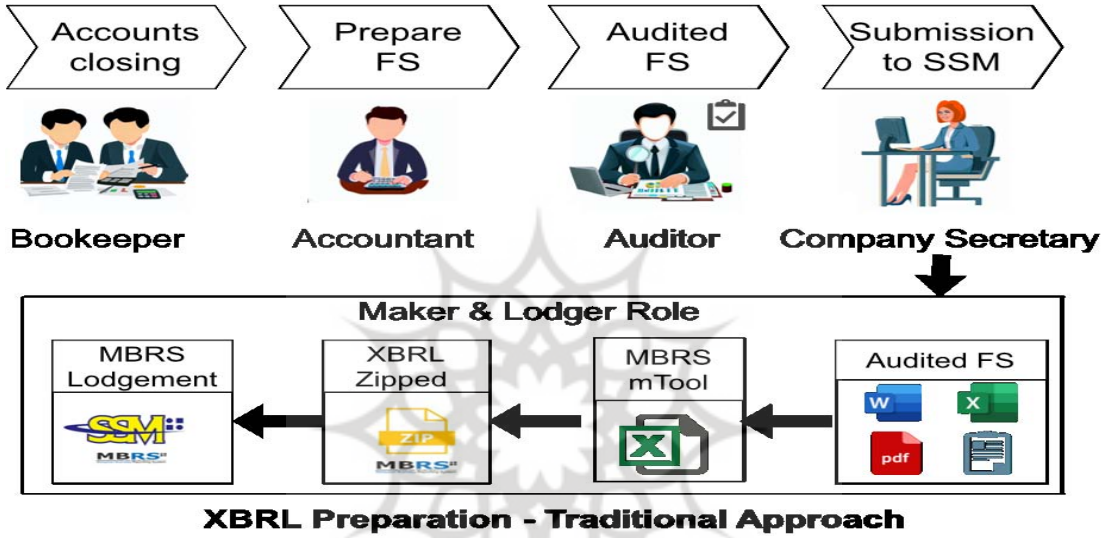

Figure 2(a). XBRL Preparation under Traditional Approach

(Source: Author)

Strategic Approaches to XBRL Data Assurance

In developed countries, governments have shifted from using XBRL to adopting iXBRL as one of the solutions to address data assurance challenges. iXBRL offers advantages because it combines easily readable financial statements with embedded XBRL tags. This approach simplifies the interpretation of financial data, benefiting both humans and automated systems (Lidia, 2020; Hoitash et al., 2021). As Malaysia continues to use XBRL, local software developers have adopted a strategic approach to tackle data assurance issues, as illustrated in Figure 2(b) below. This approach involves integrated automation to enhance data accuracy. Initially, accountants undertake pre-audit digitalization, followed by digital audits conducted by auditors. Subsequently, the audited data is sent to the company secretary, who then submits the AutoXBRL zip file to the MBRS platform.

This will help the company secretary, who lacks accounting knowledge, avoid spending excessive time inputting every single item into the platform. The company secretaries no longer bear the burden of manually inputting data into XBRL. Instead, audited financial

statements are automatically converted into the XBRL format after completing the auditing process. Subsequently, the XBRL zip file is sent to the company secretary for submission to the MBRS platform. This method guarantees data accuracy and adds an extra layer of assurance, ultimately improving the quality of financial reporting. It eliminates the need for manual data input, as seen in the previous approach depicted in Figure 2(a). Therefore, as depicted in Figure 2(b), through the utilization of integrated automation, preparers can significantly reduce the likelihood of inputting incorrect information or intentional errors because audited financial statements will be converted automatically through the system.

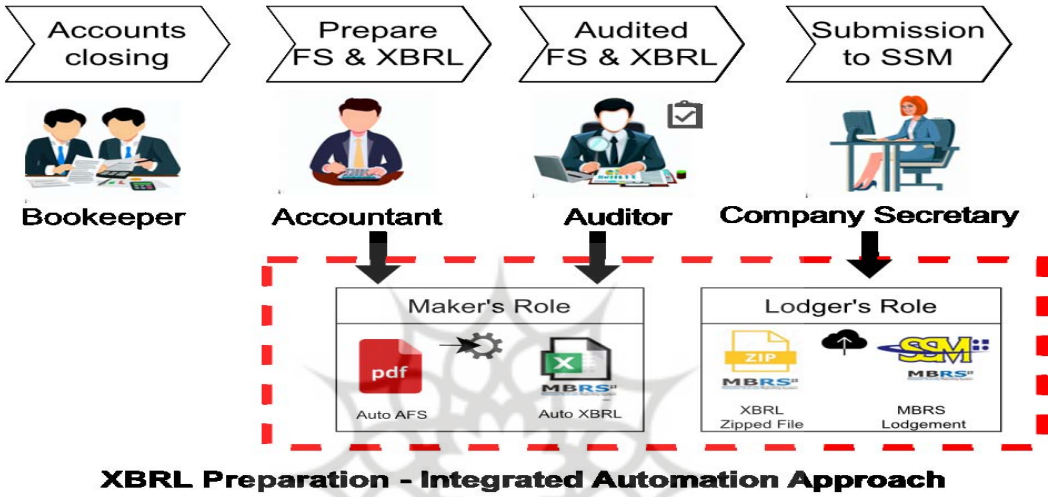

Figure 2(b). XBRL Preparation under Integrated Automation Approach

(Source: Author)

Conclusion

This study makes several noteworthy contributions to the existing body of literature. Firstly, it enhances our academic understanding of data assurance within XBRL implementation. This research is unique as it focuses on the submission of financial reports to the XBRL platform, which is applicable to all companies, aiming to foster a standardized business reporting environment in Malaysia. This approach diverges from previous studies, which predominantly centered on the context of the capital market (Alkhatib et al., 2019; Fitri, 2022; Pinsker & Felden, 2016) and financial institutions (Alsharayri & Al-Arabiat, 2021; Mousa & Pinsker, 2020). Findings indicate that the data assurance issue has been addressed by various software developers in Malaysia by introducing solutions to help convert audited reports in PDF format into the XBRL format for producing instance documents for filing purposes. Thus, it offers valuable recommendations to regulators and preparers concerning the adoption of newly developed software designed to enhance data quality through the utilization of available AI technology, thereby ensuring data accuracy. This shift exemplifies the power of technology, as highlighted by Aman (2021) and Fernandez and Aman (2021), particularly the utilization of AI.

Despite the existing validity function within CCM's system, which only accepts submissions if the entered amounts match, this software significantly reduces the need for human intervention while maintaining a cost-effective approach for preparers. However, the findings reveal a discrepancy between the perspective of the software developer and the initial challenges encountered by preparers. For instance, while the MBRS platform was intended for use by company secretaries and accountants acting as preparers, the software was designed with auditors in mind. Consequently, there is a possibility that the preparers did not receive adequate information about the software or were unaware of its existence, leaving unresolved data assurance issues. Furthermore, it is worth noting that the adoption of this software solution was voluntary, and there was no mandatory requirement imposed by the regulator. Future research should delve deeper into assessing the effective utilization of the software by preparers to gain a comprehensive understanding of its impact on addressing data assurance concerns. Despite the advent of sophisticated audit software embedded with artificial intelligence functionalities aimed at enhancing the quality of XBRL filings, a potential gap exists in its adoption due to possible low awareness among preparers. Conducting a comprehensive survey or empirical study to quantitatively evaluate the awareness and readiness of preparers in leveraging such advanced audit software could be considered for future research.

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Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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