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AUDIT ISSUES AND CONTENT
ANALYSIS OF AUDIT PRACTICES
ASSOCIATED WITH CORPORATE
FINANCIAL REPORTING
ON THE INTERNET

Richard Fisher
Peter Oyelere
Fawzi Laswad

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Commerce Division
PO Box 84
Lincoln University
CANTERBURY

Telephone No: (64) (3) 325 2811
Fax No: (64) (3) 325 3847
E-mail: fisherr@lincoln.ac.nz

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Abstract

The use of the Internet as a channel for the dissemination of corporate information is a recent and fast growing phenomenon. Indeed, it is likely that it will become the principal medium for the distribution of financial information to users. The use of the Internet for financial reporting creates unique opportunities and challenges for the auditing profession. Notwithstanding the significance and urgency of the related auditing issues, relatively little research has been conducted in this area. This study seeks to identify the key audit implications of Internet financial reporting, based on a comprehensive review of the academic and professional literature, and to obtain empirical evidence concerning the nature and extent of audit-related web practices through a content analysis of New Zealand listed company websites. The literature review highlighted issues relating to the role and responsibility of auditors for information placed on corporate websites; the potential for inappropriate association of the auditor's report with unaudited information located at the auditee's website, or information linked to/from external websites, and the inappropriate omission of the auditor's report from the website; the appropriate audit procedures; and the nature, timing, form, and content of the auditor's report on the Internet. The results of the content analysis of auditor web-related practices reveal several significant concerns for the auditing profession in relation to the presentation, context, and content of the auditor's report in a web-based environment. Given the currency and significance of the issues raised in this paper, and the lack of current guidance by accounting professional bodies, the results of this study are likely to be of particular value to practicing accountants, accounting regulators, and accounting research.

Key words: Internet, World Wide Web, Audit, Assurance, Financial Reporting, Content Analysis

JEL classification: M41

Contents

List of Tables	i
1. Introduction	1
2. Literature Review	2
2.1 Financial Reporting on the Internet	2
2.2 Auditing Issues Associated with Corporate Financial Reporting on the Internet	6
2.2.1 The Role and Responsibilities of Auditors in Relation to Corporate Financial Reporting on the Internet	6
2.2.2 Association of the Auditor's Report with Unaudited and/or Incomplete Financial Information; and the Omission of the Auditor's Report	8
2.2.3 Audit Procedures	10
2.2.4 The Format, Content and Timing of the Auditor's Report	12
2.3 Responses of Professional Bodies	14
3. Research Design	17
4. Results	20
5. Discussion and Conclusion	26
References	29

List of Tables

1.	Collection Instrument	18
2.	Presentation of Financial Information on the Web	21
3.	The Presentation and Context of the Auditor's Report on the Web	23
4.	The Content of the Auditor's Report on the Web	25

1. Introduction

The use of the Internet as a channel for the dissemination of corporate information is a recent and fast growing phenomenon. In addition to corporate, marketing, and customer support information, many companies are choosing to make available financial information on their corporate websites, often under the banner of investor/shareholder relations. This global trend is confirmed by an increasing number of studies¹ and parallels the recent rapid growth in online investing and electronic commerce.

It is likely that in the near future, the Internet will become the principal medium for the distribution of traditional financial reports to users. The IASC recently stated that:

“... in our view, it is likely that in the next five years or so, business reporting to stakeholders will move almost entirely from the current primarily print-based mode to using the Web as the primary information dissemination channel, with the print-based mode as secondary channel.” (Lymer et al., 1999, p.4)

In several jurisdictions, including New Zealand, many reporting entities already offer their users the option of either being sent traditional hard-copy financial statements by mail or being provided with access to an electronic version on the Internet. Indeed, in the US, the Securities and Exchange Commission (SEC) announced in February 2002 that it intends to propose changes in corporate disclosure rules that includes requiring public companies to post their reports on their websites at the same time they are filed with the (SEC, 2002).

The use of the Internet for financial reporting creates unique opportunities, challenges and implications for the auditing profession. Despite the significance and urgency of the audit issues associated with Internet financial reporting (IFR), little research has been conducted in this area, with the notable exception of Debreceeny and Gray (1999). Further, few professional accounting bodies have taken steps to identify and address the relevant issues. Based on a review of the professional and academic literature, this study seeks to identify the

¹ Such studies have examined Internet financial reporting practices in New Zealand (Fisher, Laswad, and Oyelere, 2000; McDonald and Lont, 2001), UK (Craven and Marston, 1999), US (Ashbaugh, Johnstone and Warfield, 1999), Austria and Germany (Pirchegger and Wagenhofer, 1999), US and Canada (Trites, 1999), US, UK and Germany (Deller, Stubenrath and Weber, 1999), Sweden (Hedlin, 1999), Spain (Gowthorpe and Amat, 1999), in addition to an International Comparison (Lymer et al., 1999).

key audit implications of Internet-based financial reporting, and, through a comprehensive content analysis of corporate websites in New Zealand, provide critical insights into extant external auditor practices in relation to this new medium for financial reporting.

The results of this study are of particular relevance to the accounting profession, standard-setters, and accounting academics. With the exception of recent UK and Australian auditing guidelines, there are currently no professional auditing pronouncements addressing the significant auditing issues associated with Internet financial reporting, despite its widespread practice. Standard-setters will be able to refer to the results of this study in determining appropriate responses to the growing IFR phenomenon. Further, given that IFR may eventually supplant traditional GAAP-based hard-copy financial statements, it is imperative that academics and other instructors of accounting become familiar with the relevant issues in order that they may begin to modify their research programmes and course syllabi accordingly.

The remainder of this paper is organised as follows. Section 2 identifies emerging audit issues from the development of Internet-based financial reporting, and reviews empirical research and professional guidelines. Section 3 overviews the research method employed in the study, while section 4 presents the results of the content analysis of corporate websites. Discussion and conclusions are provided in section 6.

2. Literature Review

2.1 Financial Reporting on the Internet

Robert Elliot's insightful article in 1992, *The Third Wave Breaks on the Shore of Accounting*, predicts that the information era will necessitate significant changes to business models, organisational structures, and business information needs. To meet the new demands of business decision-making in the information era, changes are also being required of accounting - both to internal and external reporting. Elliot believes that wide area networks (WANs) and relational databases would be the two most critical technologies available to accountants for responding to the challenges of the information era. Since Elliot's article, the Internet has moved from being a technology of largely academic interest, to one which pervades business and society globally. The Internet can be thought of as an extreme form of

WAN, consisting of a global network of networks, and may also be used to provide a gateway to corporate databases.

The Internet is having a profound impact on external financial reporting. Many corporations have established websites on the Internet and a substantial proportion of these use them to efficiently distribute financial information to corporate stakeholders. A recent New Zealand study (Fisher et al., 2000) revealed that 56 per cent of listed New Zealand companies have corporate websites, and of those, 73 per cent use them to disseminate financial information. A recent update by McDonald and Lont (2001) indicates a further growth within a short period in the display of financial information on the Web. Similar trends have been observed internationally: UK (Craven and Marston, 1999), US (Ashbaugh, Johnstone and Warfield, 1999), Austria and Germany (Pirchegger and Wagenhofer, 1999), US and Canada (Trites, 1999), US, UK and Germany (Deller, Stubenrath and Weber, 1999), Sweden (Hedlin, 1999), Spain (Gowthorpe and Amat, 1999), and an International Comparison (Lymer et al., 1999).

The benefits arising from the provision of financial information on the Internet have been discussed at length by a number of authors (e.g., McCafferty, 1995; Louwers, Pasewark and Typpo, 1996; Green and Spaul, 1997; Trites and Sheehy, 1997; Fisher et al., 2000). These benefits include:

(1) Improved cost efficiency

- The reduction of production and distribution costs associated with paper-based annual reports.
- The reduction of incidental requests for paper-based reports from non-shareholder financial statement users.

(2) Improved user access to information

- Allows flexible non-sequential access to information through the use of hyperlinks.
- The ability to provide specific information to users that meets their specific information needs.
- The opportunity for providing more information than available in the annual report.
- The opportunity to provide real-time information.

- The ability to provide information in an interactive manner with the ability to search the content of the reports by using key words.
- Improving the accessibility of information that results in more equitable information dissemination.

In the near future, it is likely that the Internet will become the principal medium for the distribution of financial reports to users. The US Securities and Exchange Commission (SEC) supports the view that the use of technology such as the Web enhances the efficiency of capital markets through the rapid dissemination of information to financial markets in a more cost efficient, widespread, and equitable manner than traditional paper-based methods (SEC 1995, FASB 2000). Further, it stated that as more investors have access to and use the Internet, the Commission will consider encouraging the use of the Internet as a prime dissemination tool (SEC 2001).

Few countries currently regulate the disclosure of financial information on the Internet.² It is not surprising, then, that the previously mentioned studies surveying actual corporate web practices have revealed considerable variation in the nature, extent, format, and quality of financial information disclosed on the Web. For instance, the types of financial disclosures appearing on corporate websites have included comprehensive annual reports; interim, summary, and/or partial financial statements; financial highlights; and other selected financial information. Financial information is typically published on the Web in either Hypertext Mark-up Language (HTML)³ or Adobe Acrobat's Portable Document Format (PDF)⁴, and may also be augmented with data analysis tools, sophisticated graphics, and/or streaming audio and video.

² The 1999 report commissioned by the IASC, *Business Reporting on the Internet*, notes that in France, the Commission des Opérations de Bourse (COB) has regulated corporate web disclosure in a similar fashion to the long-standing regulation of the French national Minitel system (Lymer et al., 1999). The report also notes that the Toronto Stock Exchange in Canada has published guidelines for corporate reporting on the Web (pp. 57-58).

³ HTML has been described as the *lingua franca* of the Web (Lymer et al., 1999, p. 26). It essentially permits the 'tagging' of the content of a page in order to describe how it should appear through the recipient's Web browser software, e.g., should text be indented?, should it be in large font and bolded?, etc. HTML supports the hyperlinking of text and/or other objects within a page or between pages in order to facilitate on-screen navigation. Links are also possible to non-HTML resources, such as downloadable programs, email addresses, etc., even if they are located on other servers accessible through the Internet.

⁴ PDFs are created with Adobe's Acrobat software. This application converts scanned versions of hardcopy documents or electronic versions of certain non-PDF documents to PDF. The resulting PDF documents preserve the look and content of the original documents making them useful for the purposes of document exchange. Once created, they can be conveniently distributed through email, Web pages, and other media. PDF files created with Acrobat version 5 now incorporate many of the hypertext linking abilities of HTML documents, and are now even searchable using certain popular Internet search engines, such as Google (<http://www.google.com>).

As pointed out in the Institute of Chartered Accountants of England and Wales' report, *The 21st Century Annual Report*, “[c]orporate reporting has traditionally been regulation-led with innovations arising principally from new accounting standards and, less frequently, changes in legislation” (ICAEW, 1998, p.2). The fact that technology and other factors, such as globalisation and notions of accountability, are currently driving changes in financial reporting practices reflects a fundamental change in the process of accounting development. Whilst external drivers, such as technology, help ensure the ongoing relevance of the accounting product, the speed with which they are revolutionising accounting makes it difficult for regulators to keep pace. For example, in the absence of formal relevant professional promulgations, the adoption of the Web for corporate disclosure has seen the US SEC initiate more than 200 web-related enforcement actions as of March 2001 (Hodge, 2001), and recently establish an office (the Office of Internet Enforcement) dedicated exclusively to web surveillance and enforcement.

As is the case with IFR, no national professional body has yet issued formal standards, which address the specific auditing issues associated with this popular practice⁵. This paper seeks to identify such issues, in order that professional bodies and regulators may develop well-informed policies, regulations, and standards in response to these issues.

A review of the extant literature, reveals a number of factors specifically associated with IFR that may have significant implications for auditors. These factors include the following:

- corporate disclosure over the Internet is currently unregulated and the application of some regulations and laws to the Internet environment are not yet well developed;
- the conversion/transposition process involved in publishing information onto the Internet is susceptible to error;
- information on the Internet is exposed to access and modification by unauthorised users both external and internal to the reporting entity;
- information on Internet has the potential to be very fluid in nature. Information can be published, modified, or deleted remotely or locally at virtually any point in time without leaving any evidence of these actions ever having taken place;
- information from external sources (e.g., websites, ftp sites, etc.) can be easily incorporated into a corporate website through hyperlinks; and

- users are demanding both greater timeliness in corporate disclosure, and greater depth and breadth of disclosure (particularly non-GAAP information).

These factors have potentially wide-ranging implications for the audit profession internationally. Issues of concern include:

- the role and responsibility of auditors for information placed on corporate websites;
- the potential for an inappropriate association of the auditor's report with unaudited information located at the auditee's website or information linked to/from external websites, and the inappropriate omission of the auditor's report from the website;
- the appropriate audit procedures; and
- the format, content and timing of the auditor's report on the Internet.

The following section of the paper elaborates on each of these auditing issues.

2.2 Auditing Issues Associated with Corporate Financial Reporting on the Internet

2.2.1 The Role and Responsibilities of Auditors in Relation to Corporate Financial Reporting on the Internet

IFR raises questions about the role and responsibilities of auditors in relation to corporate financial reporting on the Internet. Do the external auditor's duties extend to examining/monitoring annual reports that are placed on corporate websites? If so, what are their responsibilities with regards to unaudited financial and non-financial information, which may also appear on the websites?

With the production of traditional audited financial statements, the hard-copy and dated auditor's report is supplied to the preparer for incorporation into the final printed annual report. The auditor would normally be expected to check the conformance of the audited accounts with the final printed annual report. Conceptually, if one considers terms such as

⁵ The Australian Accounting Research Foundation and the UK's Auditing Practices Board have issued guidance notes concerning auditor issues associated with IFR, and these are discussed in a subsequent section of this paper.

‘publishing’ and ‘document’ in their broadest sense⁶, the reporting process is not significantly different when the annual report is to be published on the corporation’s website - the company is simply employing an alternative medium for communication. Accordingly, there would appear to be a strong argument for auditors being responsible for checking that audited financial statements correspond with those published on corporate websites. Interestingly, the US profession seems to have adopted an alternative view. Bagshaw (2000, p. 22) states that in the US, “current thinking does not regard financial information on websites as constituting ‘published’ information at all. Auditors are therefore not required to read financial information on websites, nor are they required to consider its integrity or completeness, even if the auditor’s report is published with the information”. Clearly the courts may take a different interpretation in due course. In particular, if users’ expect the audit process to include such steps and the auditors do not provide appropriate disclaimers.

If the premise is accepted that auditors’ responsibilities towards published financial statements are similar regardless of the medium of communication, then auditors may also be responsible for ensuring the consistency between web-based audited financial statements and other information published on corporate websites. New Zealand’s auditing standard AS-518: *Other Information in a Document Containing an Audited Financial Report*, for example, indicates that auditors should read other information included in documents containing the audited financial statements, such as traditional print-based annual reports, to identify whether there are material inconsistencies with the audited financial report. The standard makes it clear that the term ‘document’ is not to be interpreted as only meaning the annual report: “This standard is equally applicable to other documents and regardless of the nature of the document that contains an audited financial report, the auditor has a responsibility to read the other information to identify whether there are any material inconsistencies with the audited financial report” (AS-518, para 3). Similar auditing standards exist in other countries, such as UK (Auditing Practice Board Standard 160 *Other Information in Documents Containing Audited Financial Reports*) and Australia (AUS 212 *Other Information in Documents Containing Audited Financial Reports*).

A contrary view is adopted in the US. Interpretation No. 4 of Statement of Auditing

⁶ Such interpretations are not unreasonable given recent moves by various governments to introduce legislation designed to reduce the uncertainty regarding the legal effect of electronic information, and to allow certain paper-based legal requirements, such as a requirement for writing, a signature, or the retention of documents, to be met by using electronic technology. Examples include the UK’s Companies Act 1985 (Electronic Communications) Order 2000, and New Zealand’s Electronic Communications Bill which was tabled in October 2000.

Standards (SAS) No. 8 (*Other Information in Documents Containing Audited Financial Statements*) indicates that auditors do not have a responsibility to read information contained in electronic sites or to consider the consistency of such information with the audited financial statements which appear in conjunction with that other information (AICPA, 1997).

Printed documents, such as traditional hardcopy annual reports are static in nature. Once printed, alterations are difficult to make without considerable effort and cost. However, a characteristic of web-based documents is the ease, speed, and efficiency with which they may be added, modified, or deleted. For example, real time stock price information may be incorporated into a web page such that it is updated on a near continuous basis. In a sense, then, corporate websites contain ‘living’ documents. In this environment, it could be argued that just as an auditor has a responsibility to consider other information for consistency with web-based audited financial statements at the time such financial statements are first published on the Internet, so too does the auditor have a responsibility to ensure that consistency is maintained subsequent to publication. Clearly the latter requirement would be an onerous one for auditors. Possible audit responses to this responsibility are discussed in a later section.

Should auditors be responsible for providing assurance to users concerning such ‘other information’ appearing along side audited financial statements on corporate websites? This would appear to be outside the scope of the traditional financial statement audit, just as it would in relation to other information appearing in a printed document which includes audited financial statements. However, providing assurance regarding ‘other information’, or indeed other aspects of the client’s website (e.g., controls, security, etc), could legitimately be offered as a separate engagement.

2.2.2 Association of the Auditor’s Report With Unaudited and/or Incomplete Financial Information; and the Omission of the Auditor’s Report

A common feature of corporate websites is that unaudited information is incorporated with audited information in such a way that it is difficult for users to distinguish between audited and unaudited information. Specifically, the use of hyperlinks between different documents on corporate websites allows quick navigation between documents but also contributes to a blending of information (Hodge, 2001). Web-based documents lack the physical distinctiveness of hard-copy documents, which affects recall and also contributes to a

blending effect (Hodge, 2001). From the auditors' perspective, there is a risk that such blending will lead to users inappropriately perceiving unaudited information as audited, and consequently ascribing more credibility to it than is warranted.

'Ring fencing' audited information may be useful in mitigating the blending problem on the Web. This may be achieved in a number of ways. First, audited information could be made more visually distinctive from unaudited information. The use of labeling, borders, or watermarks have all been mooted (Hodge, 2001). Second, 'intermediate' pages can be displayed upon entering and leaving audited sections of the website, warning users that they are changing zones. Third, the use of a different file format for encoding the audited accounts, such as Acrobat's PDF. Last, Debreceeny and Gray (1999) suggest either applying a digital signature to the annual report, which will indicate the area of the website that has been audited; or by placing all audited web pages on the auditor's website.

Empirical evidence of the 'blending' of unaudited and audited information by users is provided in a recent laboratory study. Using a sample of MBA students, Hodge (2001) found that subjects who viewed a website employing hyperlinks between audited and (optimistic) unaudited documents, rather than viewing similar information presented in hard-copy form, were more likely to misclassify unaudited information as audited. Further, these subjects also assessed the credibility of the unaudited information as higher than those reviewing the hard-copy documents. Those subjects who assessed the unaudited information as more credible also judged the firm's earning potential to be higher. Hodge (2001) also found that a simple notifying aid ("Audited" vs "Not Audited") mitigated some of the previously mentioned blending effects.

The use of hyperlinks from web-based audited financial information to content on external websites, such as analysts' reports, may exacerbate the blending problem, and expose preparers and auditors to legal liability. For instance, the SEC have stated that companies can be liable for the external hyperlinked information, if they are deemed to have 'adopted' (endorsed or approved) such information. Whether the company has adopted the information will depend on factors such as the *context of the hyperlink* (e.g., what the company has said or implied about the hyperlink); the *risk of confusion* (e.g., the presence or absence of precautions against investor confusion about the source of the hyperlinked information); and the *presentation of the hyperlinked information* (e.g., company's efforts to direct an investor's attention to particular information by selectively providing hyperlinks) (SEC, 2000).

Insufficient information can obscure important facts and create potential problems for auditors. For example, if only excerpts of the audited financial statements or summary audited financial statements are published together with an auditor's report on the Internet, then there is risk that a misleading view may have been presented. Similarly, the publication of a full audited annual report without an auditor's report may again obscure important information, and consequently prove misleading. Company law in the UK (Section 240 of the Companies Act 1985) specifically addresses these issues, by requiring that whenever statutory accounts are published, they must always include the corresponding auditor's report; and when non-statutory accounts are published, they must always exclude an auditor's report. However, as is the case in New Zealand, not all jurisdictions have such requirements incorporated into their companies' legislation.

Empirical evidence of selective omissions of information pertaining to audited financial statements was revealed in a US study by Ettredge et al. (2000). Their study found that companies receiving going concern modifications in their auditors' reports were more likely to omit the auditor's report from their websites than companies receiving unmodified audit reports. This phenomenon has been observed in New Zealand. For example, it was recently reported that a delisted company suffering financial difficulties, Power Beat International, failed to include with their on-line financial statements auditor's reports relating to several financial periods. These audit reports purportedly had going concern qualifications (Robb, 1999).

Concern over the omission of auditors' reports was also noted in a UK study (Hussey et al., 1998). The researchers in this study surveyed 63 UK FTSE companies publishing financial information on the Web in 1998. Their analysis revealed that where detailed accounts were published, 15 per cent of companies omitted an auditor's report and gave no indication whether the information had been audited. This situation was found to be even more common with respect to the following forms of web-based financial information: interim financial statements (18%), preliminary financial information (24%), summary financial statements (25%), and financial highlights (92%). These results indicate that users may frequently be unsure whether financial information appearing on corporate websites are audited.

2.2.3 Audit Procedures

Many of the issues raised in the preceding sections have potential implications for audit procedures. This section considers the nature of these procedures.

Section 2.2.1 above indicated that, as with hardcopy financial statements, the auditor should assess the correspondence of the electronic version of the financial statements published on the client's website with the audited version of the financial statements. Further, section 2.2.1, made an argument for auditors taking ongoing responsibility for reading other information contained in client websites in order to consider the consistency of such information with the web-based audited financial statements both before and after publication of the latter. This would seem to require that auditors seek to be informed of all material changes to web content in a timely manner, and to perform 'spot check' website reviews on an ongoing basis. Automated tools could be used by the auditor to facilitate such continuous review. For example, resources are currently available on the Web which allow auditors to be automatically notified of any changes to specified web pages. For example, Pumatech offers a service called Mind-it®, which allows monitoring of specified pages for any changes, or any changes to key words, numbers, or even specified text.

Annual reports and other information published on corporate websites may include an array of multimedia features, such as animations and streaming audio and video. Whilst such features provide companies with an opportunity to better improve communication of information to users relative to traditional print media, their improper construction may distort information and potentially mislead website visitors. In a web-based environment, auditors may have to consider whether information communicated using such multimedia technology is materially consistent with accompanying audited financial statements. However, no authoritative guidance currently exists to assist auditors in such a determination. Debreceeny and Gray (1996) and Steinbart (1989) have noted the lack of research and guidance with respect to the audit of non-financial and non-narrative information.

As with the traditional print-based distribution of financial statements, auditors would not appear to have any responsibility for testing the security and controls surrounding the publication process. The testing of security and controls over website construction and ongoing operation and update, could, however, form part of a separate assurance engagement.

Section 2.2.2 discussed circumstances in which the design of corporate websites may lead to an inappropriate association of the auditor's report with unaudited and/or incomplete financial information; or the inappropriate omission of the auditor's report. It would seem appropriate that auditors communicate their expectations with regards to these issues to management at an early point in the engagement, perhaps via the engagement letter. Further, the auditor should make subsequent enquiries and perform checks during the course of the audit to ascertain the techniques that management are employing to minimise the possibility of inappropriate associations between audited and unaudited information or the inappropriate omission of the auditor's report.

2.2.4 The Format, Content, and Timing of the Auditor's Report

Financial reporting on the Internet necessitates consideration of the nature and content of the auditor's report. Empirical studies show a diverse range of current audit reporting practices on the Web. Debrecey and Gray (1999) conducted a survey concerning the web reporting practices of the 15 largest companies in the UK, France, and Germany. They found that 44 out of the 45 sample companies maintained websites, and of those, 36 incorporated financial statements. The researchers focused their attention on the 17 companies that presented their financial statements in HTML format. Auditors' reports were included on the Web for 10 out of the 17 companies. None of the ten companies' auditors' reports included scanned auditors' signatures. Further none of ten companies' financial statements contained hyperlinks to their corresponding auditors' reports. All of the auditors' reports were located on the companies' websites and only four auditors' reports contained links to the financial statements.

FASB's BRRP report includes a 1999 survey of the web practices of the Fortune 100 companies. An interesting finding was that 22 per cent of the auditors' reports located online included hyperlinks (usually to notes mentioned in the auditors' reports). The authors commented that "[s]ince the auditors did not deliver their reports with built-in hyperlinks, the companies must have added them later. This will be an interesting topic for audit regulators to ponder" (FASB, 2000, p. 26).

Specific issues arise when auditors publish their reports in an electronic format. For example, auditor's reports presented on the web are exposed to manipulation from sources both internal and external (e.g. hackers) to the client. Further, the electronic nature of the auditor's report file can make such manipulation difficult to detect. As is evident from Debrecey and Gray's

(1999) study, most audit reports appear to lack even a scanned image of the auditor's signature, making auditor's report authentication problematic.

Problems associated with the integrity and authentication of the auditor's report can be dealt with using standard cryptographic techniques commonly used over the Internet. An auditor can digitally sign an auditor's report (or indeed a complete audited annual report) by attaching a digital signature file with the web-based auditor's report. This attachment would have been encrypted using the auditor's secret key (private key) and can only be decrypted using the auditor's publicly-known key (public key)⁷. The information encrypted by the auditor in the signature file would be the result of a hashing function (algorithm) that would have been performed on the auditor's report file by the auditor. To verify the web-based auditor's report, the user of the auditor's report would obtain the auditor's public key via a digital certificate issued by some trusted third party, such as a certificate authority, and decrypt the digital signature. If the user then performs the same hashing function on the web-based auditor's report that the auditor had used in producing the digital signature, the user should come to the same hash result as included in the digital signature. Any difference in result would signify a discrepancy between the auditor's version of the auditor's report, and that obtained from the client's website. Assuming no discrepancy and that the auditor's private key had not been compromised (discovered by another party), the user would have confidence that that the report had come from the audit firm, as only the auditor's private key could have been used to generate encrypted information that could subsequently be decrypted using the auditor's public key. Digital signatures and certificates can be processed by most recent versions of common web browsers, such as Netscape® Communicator and Microsoft® Internet Explorer.

Other alternative techniques to assist in the authentication of the auditor's report, include locating the auditor's report on a server controlled by the audit firm, and the use of digital watermarks embedded in digital images, such as scanned images of the auditor's report and/or signature (Debreceeny and Gray, 1999).

Whether the conventional auditor's report format is the most appropriate format for the new web environment report requires further consideration. Alternatives to the conventional full

⁷ This asymmetric key system is commonly referred to as public key cryptography. Interested readers may wish to refer to Kogan et al. (1999) or American Bar Association Section of Science and Technology Information Security Committee (2002) for further information concerning the use of public key systems in the commercial environment.

report include an icon, such as that used for *WebTrust*, or a drop-down box on each relevant page (Elliot, 1994).

The content of the report may need to be altered to limit the risk that it is mistakenly associated with unaudited information appearing on the corporate website. For example, the scope of the audit could be communicated in the auditor's report by specifically naming or hyperlinking the financial statements subject to audit (or page number references if the financial statements are in PDF format).

Other modifications to the content of the traditional auditor's report may be necessary. For instance, cautionary comments by the auditor concerning the general risks of relying on Internet financial reports may be considered warranted, as might clarification of management's and the auditor's role with respect to the corporate website content and security. Further, given that corporate websites are accessible globally, auditors may also wish to clarify which versions of generally accepted accounting principles and generally accepted auditing standards are applicable to the audited accounts.

2.3 Responses of Professional Bodies

Two national accounting bodies, in Australia and the UK, have issued promulgations relating to the reporting of financial information on corporate websites. Also, the IASC has issued a related discussion paper.

In late 1999, the Auditing & Assurance Standards Board of the Australian Accounting Research Foundation became the first national accounting body to produce an authoritative statement on the auditing implications of electronic presentation of financial statements, when it issued the guidance statement, *AGS 1050 Audit Issues Relation to the Electronic Presentation of Financial Statements*. AGS 1050 states that the reporting entity is responsible for the electronic presentation of financial statements on its website, and for ensuring adequate security and control. The guidance statement recommends that these responsibilities should be communicated in the engagement letter and auditor's report. AGS 1050 indicates that assurance provided by the auditor over aspects of the client's website, other than the financial statements, represents a separate website assurance engagement and, consequently, do not form part of the audit of financial statements.

With respect to audit procedures, AGS 1050 states the auditor should communicate with management regarding matters relating to the electronic presentation of the audited financial statements, such as:

- management’s responsibility for the website and its content;
- legal provisions relating to the distribution of the financial reports;
- nature, extent, and format of financial information provided on the entity’s website;
- steps taken to reduce the likelihood of the website content being misleading or the likelihood of an inappropriate association between the auditor’s report and unaudited information;
- the structure of the website (e.g., the use of hyperlinks to/from audited financial information or auditor’s report); and
- security and integrity of the electronic financial report.

The guidance statement states that the auditor should consider whether these matters impact on the wording or format of the auditor’s report, and, in extreme cases, whether permission for the electronic presentation of the auditor’s report is to be denied. Importantly, it is clearly stated that after the financial report has been published, the auditor has no obligation to make any inquiry regarding the financial report, unless the auditor becomes aware that the auditor’s report is being used inappropriately.

With respect to the auditor’s general responsibility to read other information contained in a document containing audited financial statements, AGS 1050 indicates that “the legal framework for electronic documents is not yet well established regarding what constitutes an ‘electronic’ document ...” (para 37) and that therefore the auditor should use professional judgement in this regard.

AGS 1050 recommends that the web-based auditor’s report include the following additional information:

- Specific reference to the audited statements by name;
- A statement that the auditor’s report does not provide an opinion on any other information hyperlinked to/from the audited financial report; and
- A statement recommending that readers who are concerned with inherent risks arising

from electronic data communications should corroborate web-based financial statements with hard-copy versions.

Where a reporting entity includes less than complete financial statements, e.g., financial highlights, summary financial statements, etc., AGS 1050 recommends that management incorporate a cautionary note in their website indicating that the extracts cannot be expected to provide a complete understanding of the entity's financial situation.

The UK Auditing Practices Board's recent Bulletin 2001/1 *The Electronic Publication of Auditors' Reports* (2001) adopts a similar view to that found in AGS 1050. For example, it unambiguously ascribes management with responsibility for the maintenance and integrity of the corporate website. Bulletin 2001/1 does, however, suggest some additional audit procedures. For instance, it recommends that auditors should enquire whether directors have obtained a copy of the Institute of Chartered Secretaries and Administrators' (ICSA) guidance document, *Electronic Communications with Shareholders: A Guide to Recommended Best Practice*, and whether this guidance has been followed in connection with information presented on corporate websites. Further, Bulletin 2001/1 suggest that auditors retain a printout or disk of the final electronic version of the audited financial statements for future reference.

With respect to the auditor's report, Bulletin 2001/1 suggests the following additions to the traditional hard-copy auditor's report:

- Management's responsibility for the maintenance and integrity of the website, and that work carried out by the auditors does not involve consideration of these matters;
- Disclaimer of responsibility for changes to financial statements subsequent to their initial publishing on the website;
- The fact that legislation in the local country governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions;
- Specific identification of the other information on the website read by the auditor in order to consider whether it was consistent with the audited financial statements; and
- Specific identification of the financial statements covered by the auditor's report.

Although not an authoritative statement, the IASC's 1999 discussion paper, *Business Reporting on the Internet* (Lymer et al., 1999), contains several recommendations concerning

auditor responsibilities, which may influence future pronouncements of the IASC. The discussion paper develops a code of conduct, *Standards for Web-based Business Reporting – A Code of Conduct for Current Application*, which it believes should be the foundation of a mutual agreement for use of the Web for business reporting. In particular, it suggests that auditors of listed companies should ensure that reporting entities conform fully to the ‘code of conduct’ where they claim to do so or that any deviations are noted in the auditor’s report (p. 67). Further, auditors should actively monitor the entity’s website for significant changes to information between periodic audits, and note, by changing the auditor’s report, any changes that could bring into question the continued validity of any auditor’s report on the data (p. 67).

The preceding literature review identified various audit-related issues. To evaluate the extent of such audit issues in relation to IFR practices, it is important that a content analysis of such practices is conducted.

3. Research Design

Based on the review and analysis of the audit issues discussed in the preceding section, we developed the web collection instrument shown in Table 1. This instrument was used to identify the nature and extent of audit-related web practices on the corporate websites of listed New Zealand companies. The instrument is structured to enable the capture of data relating to the format and location of the auditor’s report, content of the auditor’s report, and inappropriate association of audited and unaudited information on the Web.

Listed companies that are categorised as ‘issuers’ under New Zealand company legislation are required under sections 209 and 210 of the Companies Act 1993 to send shareholders an annual report incorporating audited financial statements, or, if the shareholder has elected to waive their right to receive an annual report, just the financial statements with auditor’s report, not less than 20 working days before the annual meeting of shareholders. New Zealand’s Financial Reporting Act 1993 also requires that issuers send copies of their financial statements and auditor’s report to the Registrar of Companies within 20 working days after the date for signing (s 18(1)). In addition to an annual report, listing requirements of the NZSE include disclosure of a half yearly report containing interim financial information, which may or may not be audited. There is currently no requirement for listed

companies in New Zealand to publish financial information, such as that found in the annual report, on the Internet. In New Zealand, there is no central depository for electronic reporting comparable to the Electronic Data Gathering, Analysis and Retrieval System (EDGAR) site maintained by the US SEC.

Table 1
Collection Instrument

Format and location of the auditor's report

- a) What file format is used (e.g., PDF vs. HTML vs. other)?
- b) Where is report located (e.g. corporate website vs. auditor's website)?
- c) How do users find the audit report (e.g. is it listed in a table of contents/menu)?
- d) How easy is it to locate the audit report (e.g., it is given the same prominence as the audited financial statements)?
- e) Is cryptography used (e.g., digital signature)?
- f) What is the form of the signature (e.g., scanned handwritten vs. typed text)?
- g) Is the audit firm logo included ?
- h) If the logo is included, is it hyperlinked to the auditor's website?
- i) What background and/or watermark is used (if any)?
- j) Is the audit report's background and/or use of borders consistent with those used in the audited financial statements?
- k) Are there any other distinguishing factors concerning the audit report format?

Content of the auditor's report

- a) Is report an exact duplication of wording of hard-copy report or is it customised to Internet environment? If not, how does it differ?
 - i. Does the auditor's report include any disclaimers or specific/general warnings pertaining to any of the website?
 - ii. Does the auditor's report clarify the auditor's role/responsibilities with respect to website and its contents?
 - iii. Does the auditor's report highlight which jurisdiction's GAAP and/or GAAS are/is relevant?
- b) How does report refer to the audited financial statements (e.g., page references vs. hyperlinks)?
- c) Are there any other links to/from audit report?
- d) Does the auditor's report comply with ICANZ Auditing Standards (e.g., AS-702: The Audit Report on an Attest Audit)?
- e) Is the audit report qualified and/or is there an emphasis of matter?

Inappropriate association of auditor's report with unaudited/incomplete financial information or the omission of the auditor's report

- a) What sort of financial information is the auditor's report associated with (e.g., accompanies full annual report, and/or other financial information, such as interim financial statements)?
- b) Is each page of the audited financial statements designated 'audited' in any way (e.g., use of term 'audited' in title, use of a watermark, icon, etc., indicating that financial statement audited)?
- c) Are intermediate warning messages displayed when entering/leaving the audited annual report?
- d) Are audited financials statements presented without an audit report?

As at 15 August 2001 there were 211 companies listed on the New Zealand Stock Exchange (NZSE). Several methods were used to ascertain whether each listed company maintained a corporate website, and if so, the address of that site.

First, the NZSE website (<http://www.nzse.co.nz/companies>) was consulted. This site provides links to listed company websites. Next, for those companies where no web address was indicated on the NZSE website, searches using the <www.metacrawler.com> search engine were carried out. Finally, the remaining companies were contacted by telephone to find out whether or not they have established corporate websites and if so obtain web addresses. The use of multiple sources was considered necessary given the speed of developments regarding website establishment among companies. Out of the 211 listed companies, 123 were found to have websites.

Once identified, each listed company's website was visited and the entire site imported into either Adobe Acrobat or, where this was not possible for technical reasons, Microsoft FrontPage, and subsequently saved onto a compact disk. This procedure was undertaken for several reasons. The WWW is a dynamic environment and the content of corporate websites is very fluid, so the compact disk archive of corporate websites represents a snapshot of the websites at a single point in time. Consequently, the compact disk enhances the reproducibility of the study's results; allowed the corroboration of the results of the initial application of the website collection instrument by the researchers not involved in the instrument's initial application; and provides a basis for future longitudinal studies of aspects of corporate website content.

Table 2 provides some descriptive information concerning those corporate websites of listed companies that were found to contain financial information. In total, 81 companies were found to provide comprehensive annual financial statements, while 53 displayed comprehensive interim financial statements. Disclosure of summarised financial statements (which are not required under New Zealand GAAP) or other financial information extracted from the financial statements were found to be a less prevalent practice. Fifty companies displayed financial information which was not extracted from the financial statements, such as stock information, dividend history, and statistical summaries.

While most companies appeared to restrict the location of financial information to their own websites, four companies had links to other websites, which contained financial information

about the companies. For instance, two companies had links to their financial statements located on <http://www.globalregister.co.nz>, an independent website dedicated to disseminating information about New Zealand listed companies.

Interestingly, not all 84 companies providing comprehensive web-based financial statements included the auditor's report. The fact that five omitted the auditor's report is likely to be of concern to the accounting profession and securities regulators. With respect to summarised financial statements, 11 out of 18 websites containing such information also incorporated a corresponding auditor's report. Unlike the situation with comprehensive financial statements, accounting regulators may be concerned that auditors' reports are being associated with less than comprehensive financial information.

4. Results

Table 3 presents the results of the content analysis which relate to issues associated with the presentation and context of the auditor's report.

The format of the auditor's report generally mirrored that of the financial information. Table 3 clearly indicates that the most prevalent format was PDF, although a small number of reports were in HTML, Microsoft Word, or JIFF formats. Many of the companies that adopted the PDF file format (23 that published comprehensive accounts, and 1 that published summarised accounts) used Acrobat's file security features to grant users rights to download and print the auditor's report, but not the ability to modify them.

Table 3 shows that the four companies indicated in Table 2 to have links to comprehensive financial statements located on external websites, also have auditor's reports on those sites. Although not shown in either table, two of the four external websites are third-party websites not under the control of the reporting companies (i.e., <http://www.globalregister.co.nz>). As discussed earlier in section 2.2.2, one could argue that such external hyperlinks can be taken to mean endorsement of the information targeted by the hyperlink. Consequently, the auditor should regard information appearing on the third party's website as if it is being presented directly by the reporting entity. The fact that a third party, that is not in a contractual relationship with the auditor, has control of the presentation of both the audited financial information and the auditor's report, could represent a significant risk to the auditor.

Table 2
Presentation of Financial Information on the Web

	Comprehensive financial statements		Summarised financial statements*	Other financial information		
	Annual	Interim	Annual	Extracted from F/S** and F/S displayed	Extracted from F/S and F/S not displayed	Not part of F/S
Companies publishing financial information on their websites	84	53	18	25	2	50
Location of information:						
- Corporate website	80	53	16	25	2	33
- Other linked site	4	0	0	0	0	17
Provide audit report	78	0	11	0	0	0

* All companies that published summarised financial statements also published comprehensive financial statements.

** F/S = Financial Statements

Navigation to the auditor's report was not easy in many cases. Most companies made available audited financial information in one or a few large PDF files. As hyperlinking capabilities in PDF files is only available in the more recent versions of Adobe Acrobat and Acrobat Reader, most companies' PDF files do not make use of this feature. This makes navigation to the auditor's report tedious. Table 3 indicates that 61 companies presented comprehensive financial statements with auditors' reports in this manner.

Table 3 reveals that not all auditors' reports incorporated the auditors' signatures, as is required by AS-702: The Audit Report on an Attest Audit. A total of 67 of the 78 auditors' reports associated with comprehensive financial statements included the auditors' signatures, while only seven out of eleven auditors' reports linked to summarised financial statements incorporated the auditors' signatures. No evidence was found of the use of digital signatures by auditing firms in New Zealand.

The audit firm's logo is an important means by which the auditor may assist the user in distinguishing the auditor's report from all other information in the financial statements, which are sourced directly from the company. Surprisingly, a considerable number of auditors' reports (34 auditors' reports related to comprehensive financial statements, and 8 related to summarised financial statements) had no audit firm logo. Further, those audit firms that did display their firms' logos, did not take the opportunity to hyperlink the logo back to the audit firms' website, thus forgoing an opportunity to add further independence and credibility to the auditors' reports.

Watermarks and backgrounds to electronic documents may also be used to distinguish the auditor's report from its subject matter. Table 3 reveals that little effort is made to employ such features.

Links from the audit report were only used in one instance, where the auditor's report included hyperlinks to the financial statements subject to audit. Hyperlinks to the auditor's report included only hyperlinks from tables of contents. There was no evidence that management of any company attempted to associate non-audited quantitative or qualitative information with the auditors via a hyperlink to the auditor's report.

With respect to the audited financial statements accompanying the auditor's report, none of the comprehensive or summarised financial statements appeared to contain hyperlinks to information contained on external websites. This fact would be of some comfort to accounting regulators. However, none of the audited financial statements which were accompanied by auditors' reports, used techniques such as watermarks to clearly highlight that information that had been audited. Perhaps the common use of a different file format (PDF) for the audited accounts from the rest of the corporate website, was considered an adequate method of differentiation by the companies concerned.

Table 3
The Presentation and Context of the Auditor's Report on the Web

	Comprehensive annual financial statements	Summarised annual financial statements
Electronic format of auditor's report:		
- PDF	69	11
- HTML	1	0
- HTML and PDF	5	0
- Other	3	0
Companies that secure their PDF financial information from unauthorised alteration	23	1
Location of auditor's report:		
- Corporate website	74	11
- Alternative website	4	0
Navigation to auditor's report:		
- Table of contents hyperlink within annual report	10	11
- Table of contents hyperlink outside annual report	7	0
- No hyperlink direct to auditor's report	61	0
Scanned signature on audit report	67	7
Digital signature with audit report	0	0
Audit firm Logo:		
- Logo with link	0	0
- Logo with no link	44	3
- No logo	34	8
Presence of watermark for audit report	0	0
Financial information and audit report background:		
- Same	77	11
- Different	1	0
Links to/from audit report:		
- Links from audit report	1	0
- Links to audit report	17	0
Link to external unaudited website within the audited financial statements:		
- Yes	0	0
- No	78	11
Websites in which audited financial statements used borders, watermarks, backgrounds, or the term "audited" to distinguish audited from unaudited information	0	0

Table 4 presents the results of the content analysis which relate to issues associated with the content of the auditor's report. Only two companies' websites included audit reports that had been specifically modified for the web environment. Both sites displayed these modified auditor's reports for both comprehensive and summarised financial statements. As can be seen in Table 4, both reports are modified for the same issues. Indeed, both companies have head offices in Australia and have adopted the recommended auditor's report wording found in the Australia's AGS 1050. Specifically, they indicate that the directors' are responsible for the integrity of the website, and that the auditors have not been engaged to provide assurance over website integrity; the auditor's report only refers to the statements identified in the auditor's report; the auditor's report does not provide an opinion on any information that may have been hyperlinked to/from the financial statements; and that if users are concerned about the inherent risks arising from electronic data communications, they should consult the hard-copy financial statements. The relatively few number of auditor's reports that contain such statements highlights the fact that a considerable number of audit firms are unnecessarily exposing themselves to legal liability.

Table 4 shows that two auditor's reports that were associated with comprehensive financial statements used an inappropriate method to highlight the specific financial statements and notes subject to the audit. The two auditors' reports referred to financial statements by page number, whereas only HTML audited financial statements were published on the two companies' websites. To avoid confusing users of the auditors' reports, the two companies could have either named the specific financial statements and/or provided hyperlinks thereto.

Table 4
The Content of the Auditor's Report on the Web

	Comprehensive annual financial statements	Summarised annual financial statements
Audit report refers to matters relating to electronic presentation of audit financial information	2	2
Matters referred to:		
- Directors' responsibility for integrity of website	2	2
- Clarification of auditor's role with respect website	2	2
- No opinion provided on information hyperlinked to/from financial statements	2	2
- Refers users to hard-copy financial statements if concerned with inherent risks of electronic data communications	2	2
- Warning regarding domestic GAAP/GAAS differing to overseas GAAP/GAAS	0	0
Method of identifying the financial statements to which the auditor's report relates appropriate for website?		
- Yes	76	11
- No	2	0

5. Discussion and Conclusion

Based on an extensive review of the academic and professional literature, this study identified and discussed the relevant auditing issues relating the relatively new practice of financial reporting on the Internet. Further, empirical evidence of auditor practices was obtained through a comprehensive content analysis of listed company websites in New Zealand, in order to provide critical insights into extant external audit practices

A number of factors associated with the practice of internet financial reporting were identified which may have significant implications for auditors. Such factors included the unregulated nature of corporate disclosure over the Internet; risks of conversion/transpositional errors; risks of unauthorised access/modification of accounting information; the fluid nature of information on the Internet; the ease with which external information can be incorporated into websites through hyperlinks; and increasing demands from users for greater timeliness, breadth, and depth of corporate disclosures.

These factors were found to give rise to a number of issues for the auditing profession. These issues were found to relate to the role and responsibility of auditors for information placed on corporate websites; the potential for an inappropriate association of the auditor's report with unaudited information located at the auditee's website or information linked to/from external websites and the inappropriate omission of the auditor's report from the website; the appropriate audit procedures; and the nature, timing, form, and content of the auditor's report on the Internet.

The content analysis of corporate websites in New Zealand revealed a number of concerns for the auditing profession. A number of companies were found to publish audited financial reports without the corresponding auditor's report. This makes it difficult for users to determine whether the published information has been audited, and whether the auditor's report has been selectively withheld by management. Several instances were found of auditors' reports being incorporated with financial information on a third-party's website. The potential lack of control over the association between the financial information and the auditors' reports arising from this situation would be of concern to auditors.

A surprising number of electronic auditors' reports failed to incorporate scanned signatures making it difficult for users to make an assessment concerning the authenticity of the auditor's report document. Further, no audit firm made use of digital signatures. Digital signatures have much potential for auditors, as they offer the ability to simultaneously authenticate and ensure users the integrity of signed documents.

Somewhat surprisingly, no audit firms located their auditor's reports on their own websites. Locating auditor's reports on the auditor's website gives the auditor greater control over the presentation and security of the report, and additionally, helps to distinguish it from the audit subject matter. It may also increase the perceived independence of the auditor.

Little effort was made by reporting entities to make the audited information distinctive from the unaudited information, apart from using a different file format (typically PDF) for the former information. Increasing the distinctiveness of audited information, perhaps through the use of borders, backgrounds, watermarks, and alerts to users, helps mitigate the possibility of the two types of information being blended (Hodge, 2001). This is essentially a design issue that is ultimately the reporting entity's decision, but one which auditors should have an interest in influencing where appropriate.

Few audit firms modified the content of their traditional hard-copy auditor's report for the new reporting environment. Only two highlighted the relative responsibilities of management and the auditors for the integrity of the website. Clearly, auditors who don't modify their auditors' reports are at risk of legal liability.

These findings have immediate implications for the accounting profession and regulators. Authoritative pronouncements are needed to increase the awareness of issues associated with financial reporting on the internet and to standardise audit responses thereto. As auditors appear to be struggling to adapt to the new reporting environment, for example by not adopting technology available to them, such as digital signatures, a case could be made for further education of auditors in the area of information technology generally, and data communications, in particular.

Given the currency and significance of the issues raised in this paper, and the lack of current guidance by accounting professional bodies, the results of this study are likely to be of particular use to practicing accountants, accounting regulators, and accounting academics.

In the longer term, we believe that new audit-related IFR issues will arise. For example, user demand is likely to dictate the disclosure of more timely information, perhaps moving towards continuous real-time disclosure and the disclosure of more disaggregated and diverse information (Elliot, 1994). Both of these demands suggest that traditional GAAP-based hard-copy financial statements will become less significant to users (Trites, 1999; FASB, 2000).

The implications for auditors of continuous reporting are many. In such an environment, the auditor will need to place more emphasis on preventative controls and real-time detective controls. Audit technology employed will need to also become more continuous, perhaps involving embedded audit modules which constantly monitor and report exceptions in real-time. As the reporting cycle becomes shorter, the relevance of the traditional auditor's report is also brought into question. Should the auditor's report be "short interval" (i.e., issued daily or weekly, etc.); "evergreen" (i.e., always available and dated); or a "report on demand" (i.e., dated as at the time of the user request) (CICA, 1998)? The technical proficiency of the auditor will clearly be critical to the conduct of such an audit. Questions concerning the skills and competence of the auditor may also be raised in relation to the expansion of the auditor's subject matter brought about by the expected user demand for more diverse and disaggregated information.

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