

Business Reporting on the Internet: Development of a Disclosure Quality Index

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Abstract

The rapid growth of the internet has significantly influenced business reporting practices and accounting communication of companies. Studies of internet business reporting apply various indexes to measure disclosure practices. However, existing indexes suffer weaknesses in the scope covered, which is mainly limited to financial disclosure. The present study develops a new index—the Internet Business Reporting Quality (IBRQ) index—to measure the quality of internet business reporting practices. Detailed consideration was made about weights in the index. Results from multi-rater reliability test indicate that the index is a valid and reliable instrument. The index was also reviewed by prominent researchers. The IBRQ index addresses a significant gap in the literature.

Key words: financial reporting; business reporting; internet; reporting quality index; IBRQ

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1. Introduction

The rapid growth of the internet provides tremendous benefits to society. Relevant to this study, this technology has significantly influenced the financial reporting practices and accounting communication of companies. Davey and

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Homkajohn (2004) reported that a number of companies have disseminated financial information through the world wide web since 1995. In the early stages, companies used internet technology mainly for marketing, but today many companies utilize the advancement of the web to disseminate financial information to shareholders. In the near future, this practice is expected to grow to the extent that financial reporting will move entirely from a print-based to an internet-based medium, which will serve as a primary information distribution channel (Lymer, 1999).

2. Internet Business Reporting

The nature of financial reporting started to change to meet investors' needs. The changes were influenced by several factors. Among these, the emergence of new technology, particularly the internet, has shifted the way information is being presented, communicated, and disseminated. It is undeniable that internet technology plays a significant role in disseminating corporate information to dispersed shareholders all over the world. According to Beattie (2005), a company that distributes corporate financial news and performance information using internet technologies such as the web is said to practice internet business reporting (IBR). Oyelere et al. (2003) classified a company as practicing IBR when it provides a comprehensive set of financial statements or financial highlights extracted from financial statements (including partial or summarized financial statements) on their website.

At present, financial disclosure on the internet is mostly voluntary in nature. Nonetheless this information has an impact on financial decisions made by stakeholders, including shareholders, auditors, and regulators. This impact can be considerable because the financial information disclosed on a company's website can be accessed by many people anywhere in the world. However, in the absence of global regulatory standards, the present situation necessitates the cooperation of national and international organizations to ensure that corporate financial information is of the highest quality. Therefore, in an effort to rectify this situation, the present study intends to develop a valid and reliable index to measure quality of internet business reporting.

3. Research Instrument

To measure the quality of business reporting practices over the internet, the present study utilizes content analysis. Gray and Haslam (1990) suggested that data about external reporting activities of companies may be obtained through a systematic inquiry into the content of annual reports of companies using content analysis. Krippendorff (1980) defined content analysis as a research technique for making valid inferences from data based on their content. Weber (1988) viewed content analysis as a method of sorting texts or contents of written texts into various groups based on appropriate criteria. In fact, there are many studies that employed content analysis to measure disclosure activities of companies, such as Hooks et al.

(2002), Geerings et al. (2003), Hamid (2005), Marston and Polei (2004), and Alsaeed (2005). For the current study, a systematic inquiry was conducted of all information presented on a company’s website to collect empirical observations about company reporting activities.

Gray and Haslam (1990) stated that content analysis would depend on the development of an index. This implies that the index is a useful research tool in this context. In fact, many studies have developed and used indexes to assess, compare, and explain differences in the level of information disclosed in printed annual reports and on websites; see for example, Singhvi and Desai (1971), Baker and Haslem (1973), Benjamin and Stanga (1977), Chow and Wong-Boren (1987), Pirchegger and Wagenhofer (1999), Xiao et al. (2004), and Davey and Homkajohn (2004), and Celik et al. (2006). The next section reviews relevant indexes in the literature and discusses the rationale for the new index proposed in this study.

3.1 The Rationale for a New Index

In this study we propose a new quantitative index to measure the quality of business reporting on the internet by the top 50 largest companies from five countries: the US, the UK, Singapore, Thailand, and Malaysia. Detailed information on the list of companies from each country is presented in Table 1. This section discusses the rationale for the development of a new index to quantify the quality of business reporting practices on the internet. The next section focuses on the basis for the development of a new index and elaborates on its structure.

Table 1. Sources of Companies Websites

No	Countries	Source	Links
1	US	Fortune 500	Via CNNMoney.com at: http://money.cnn.com/magazines/fortune/fortune500/2007/full_list/index.html
2	UK	London Stock Exchange	http://www.londonstockexchange.com/en-gb/ Email by: Historic Price Service at: products@londonstockexchange.com
3	Malaysia	Bursa Malaysia	http://www.bursamalaysia.com/website/bm/listed_companies/list_of_companies/
4	Singapore	Stock Exchange of Singapore	http://www.ses.com.sg/ Email by: Listing on SGX at listings@sgx.com
5	Thailand	Thailand Stock Exchange	http://www.set.or.th/en/ Email by: Technical Support at webadmin@set.or.th

In reviewing literature pertaining to IBR practices, a diverse set of scoring indexes were discovered. Table 2 lists previous indexes that have been used by various researchers and highlights the scales used, types of attributes or items assessed, and its contributions and limitations.

Table 2. List of Existing Indexes on Internet Business Reporting

No	Author(s)	Scales	Item Assessed	Contribution	Limitation
1	Davey and Homkajohn (2004)	-binary -weighted	-content of the website -timeliness -technology -user support	-very objective measures -allocates weights for each attribute -gives higher scores for the use of technology -scores in percentages	-does not clearly separate the financial and non-financial data -does not analyze detail items in each attribute -is not based on IBRS
2	Hamid (2005)	-checklist index -categorical -dichotomous index	-investor relation -background information -financial information -share price -shareholders information -ratio analysis -press releases -contact detail	-detailed attributes for investor relations	-does not assess website design
3	Oyelere et al. (2003)	-binary checklist -no weights	-appropriateness of annual report format and location of annual report -content of the annual reports	-analyzes audit implication on websites -analyzes the audit report presented in website -provides a new focus of IBR-auditing -covers format of audit report presented on websites	-limited to audit related information -only based on checklist

No	Author(s)	Scales	Item Assessed	Contribution	Limitation
4	Bollen et al. (2006)	-nominal -weighted	-uses index developed by Geerings et al. (2003)	-assigns weights based on weights suggested by Beattie and Pratt (2003)	-less concerned with website design
5.	Khadaroo (2005)	-checklist -binary	-general webpage -specific attribute	-further divided specific attributes to: - presentation of investor relation - information on BOD -financial reports -provides list of items in each attributes	-no distinction between financial and non-financial data
6.	Celik et al. (2006)	-dichotomous score -no weights	-general item -investor relation item -annual report -other items not in annual report	-clearly classifies reporting format -details items of each attribute -is based on checklist issued by FASB	-no clear distinction between financial and non-financial data -applies very broad categories
7.	Khan (2007)	-checklist on existence	-financial and non-financial data	-very simple measurement of IBR	-very limited scope of assessment -covers only financial and non-financial

As summarized in Table 2, some existing indexes provide detailed attributes or items to be assessed and others merely provide a simple checklist. We also found that most indexes were developed primarily to assess the financial information disclosed on companies' websites. Some indexes further classified details of financial information, e.g., financial highlights, financial review, summary of archive data on balance sheets, income statements, cash flow statements, and notes to the account. Some indexes focused on specific components or attributes in considerable detail, such as timeliness of shareholders' information on the corporate website, user support, and disclosure format for the information presented. An example of format includes portable document format (pdf), hyper text markup language (html), and eXtensible business reporting language (xbrl). Additionally, some indexes use weights to calculate the total score to show the degree of importance of particular attributes or items in the index while others use unweighted or dichotomous scores.

In spite of contributions made by various existing indexes as shown in Table 2 to measure business reporting practices on the internet, these indexes also suffer a number of drawbacks. For example, there may be no clear distinction between the assessment of financial data and non-financial data. Further, few indexes consider website design as an attribute in the index. The consideration of website design in any internet business reporting index is critical because a website with information organized in a logical and easy-to-navigate layout is essential to providing general access to the information content.

In addition, existing indexes pay more attention to the financial content of the website and less to other information, including non-financial information such as the corporate governance report, management team information, annual general meeting (AGM) information, and auditor information. Even indexes that focused on financial information did not specify individual attributes of financial statement presentation based on the requirement of International Financial Reporting Standards (IFRS) or the revised International Accounting Standards (IAS) 1.

Moreover, almost all existing indexes restrict attention to stage 1 and 2 features of reporting quality proposed by Hedlin (1999). Hedlin (1999) argued that there are three stages in the development model in reporting over the internet. Stage 1 involves establishing web presence, stage 2 uses the internet as a medium to communicate financial information, and stage 3 signifies more advanced utilization of internet technology, including multimedia presentation, an online share registry, voting in the AGM, online trading, marketing, and xbrl format for financial reporting.

Considering these limitations of existing indexes, there is a clear need to develop a new comprehensive index to quantitatively measure the quality of business reporting over the internet. In this paper, we propose a new index—the Internet Business Reporting Quality (IBRQ) index. The IBRQ is divided into two broad categories: website design and website content. In contrast with most existing indexes, the IBRQ incorporates website design as a fundamental component of the index in assessing the quality of business reporting over the internet. The assessment

of web content is further separated into financial and non-financial data. We follow the method of some existing indexes and weight these components. To develop a reliable set of these weights for each attribute in the IBRQ, a set of surveys was designed to obtain responses from users of financial statements.

In addition, the IBRQ also considers stage 3 features of the internet reporting development model highlighted by Hedlin (1999), which involves content that cannot be provided in print-based reports. The IBRQ includes measurements on the disclosure of financial statement items determined based on IFRS requirements. This aspect alone represents an important advantage of the IBRQ over existing indexes.

Arguments may arise on the use of accounting standards to assess information presented in financial statements as redundant with the information contained in the audit report. This argument may be justified, as the auditor's opinion in the audit report may be mainly limited to paper-based financial statements and not the extended financial statements on the website. In addition, it is important to note that for some companies, particularly those using html formats; the presentation of financial statements on the website is not necessarily similar to those of paper-based reporting. However, it is beyond the intended of the proposed index to analyze the accuracy and consistency of information presented online relative to paper-based reports. The next section elaborates on the development of the IBRQ.

3.2 Basis of Development for the IBRQ Index

To ensure that the IBRQ index is developed with priority given to preserving and maintaining its reliability and validity, an extensive literature reviewed was performed including references by professional accounting bodies. As highlighted earlier, the IBRQ index is proposed predominantly to measure the quality of business reporting practices on the internet. Therefore, it is critical for the present study to provide a clear and concise definition of quality for internet business reporting practices. Such a definition may serve as a root for the current study to ensure that the index developed is able to measure quality as defined in the study. The definition of quality of internet business reporting proposed by Louwers et al. (1998) is adopted.

Louwers et al. (1998) noted that the quality of information presented on companies' websites, like that of paper-based information, is of paramount importance. They indicated that a website will be considered high quality if it is able to anticipate all the information required by users in four key areas. The first key area is breadth, which refers to the quantity or comprehensiveness of information at a particular point in time. Different users may be interested in different levels of information disclosed. For example, retail investors may be interested in only financial highlights, while financial analysts may require detailed financial information. This is consistent with Wallace and Nasser (1995), who argued that the more detailed the information disclosed, the greater the expected quality of disclosure. This was further supported by Botosan (1997), who agreed with the proposition made by Wallace and Nasser (1995) by claiming that quantity is related to quality. The next key area that reflects quality is depth, which denotes the number

of periods or historical information that is available on companies' websites. Financial data from multiple periods may help users to perform trend analyses, which may help them to make informed decisions. The third key-area is frequency, which refers to the number of times information is released in a given period on the websites. This factor is important because some users prefer to have monthly or quarterly reports rather than annual reports. The last key area is timeliness, which refers to how up-to-date or how new the information is. Louwers et al. (1998) indicated that some businesses send important information over the internet as soon as they have it. For example, some companies are likely to make an announcement simultaneously to all shareholders through email and at the same time hold an analyst press conference online. This timely information may significantly influence the decision made by the potential or existing investors as well as other stakeholders. The IBRQ index is developed with consideration to each of these four key areas as they are related to the quality of internet business disclosures.

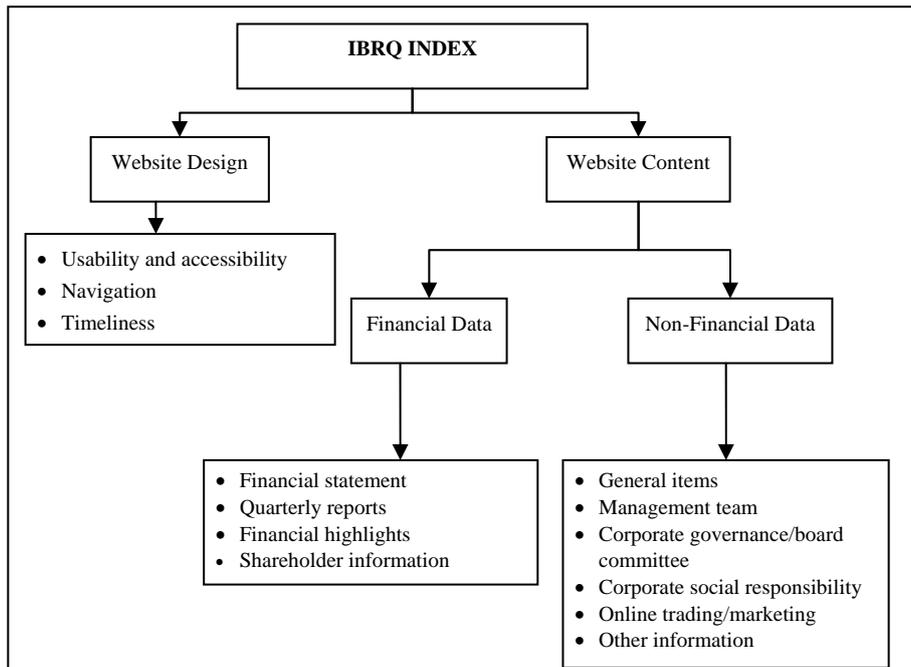
Another factor that needs to be considered in the development of the IBRQ index is the structure of the index itself. In determining the structure of the index, the present study used the guidelines and framework issued by the Investor Relations Society (IRS), known as the Investor Relations Best Practices and Website Guidelines (2006). With reference to such framework, the structure of the index was divided into two main components: website design and website content. The attributes measured under website design are usability and accessibility, navigation, and timeliness. Website content was divided into financial and non-financial data. Further details about the structure are explained in the next section.

An extensive literature review was performed to identify potential items to be measured under each attribute. This approach is consistent with Hooks et al. (2002). They reported that many researchers prefer to obtain user group input for weighting the index but not in the selection of potential items to measure under each attribute. For the purpose of identifying the potential items, the work of other researchers were examined and several were considered to be the most relevant, such as Davey and Homkajohn (2004), Celik et al. (2006), Hedlin (1999), Geerings et al. (2003), Bollen et al. (2006), and Smith and Peppard (2005). In addition, the items utilized by the Financial Accounting Standard Board (FASB, 2000) in their study also served as a basis for selecting items to be measured in the index. As the index also measures financial data, the revised IAS 1 was used as there is no IFRS on presentation of financial statements as of May 2007.

3.3 The Structure of the IBRQ Index

The IBRQ index has been developed with the primary objective to measure the quality of internet business reporting practices of publicly listed companies. Basically, the index consists of two main parts. The first part is concerned about the key factors of website design and the second part is focused on the information content disclosed in companies' websites. Web content is further divided into two main components: financial information and non-financial information. Figure 1 illustrates the structure of the IBRQ index.

Figure 1. The Structure of IBRQ Index



3.3.1 Website Design

The first component of the index is website design, which concerns the manner and style in which the web content is presented to users. Web design is a vital area because a user’s experience when he or she visits a company’s website may strongly influence their impression of the company and help form more informed decisions. Good web design is not only a good practice for the company to maximize utilization of web content but also to delivering maximum benefit to users. In assessing the website design of a particular company, there are three key points taken into consideration: usability and accessibility, navigation, and timeliness. These points are discussed below.

Usability and Accessibility

Usability and accessibility refers to the ease of access to information for all users and how friendly the website is for users. This may encourage the users to return to the company’s website, which may improve the dissemination of the company’s information. Watkins and Smith (2007) defined usability and accessibility as the ease of access and use of information presented on the website by the users. This includes how fast the user becomes familiar with the website and how fast they recall the features in the website when they revisit the website.

In this study, the usability and accessibility of company's website was measured using four different attributes: user control, accessibility to various interfaces, clarity and conciseness, and sitewide features. Examples of items utilized to measure user control are measures of the ability to control font size, color, and text. Descriptions of images and recognizable web address are elements used to measure accessibility to various interfaces. Clarity and conciseness is measured in terms of readability of text, the alignment of the text, and number of graphic images presented on the website. Finally, sitewide features is measured via the availability of printable page, terms and conditions, and number of foreign languages available.

Navigation

A good website should be easy to navigate and intuitive to use. A high quality navigation facility may result in quick and easy access to all information needed by users. We consider several key points in determining the navigation quality of particular websites. We examine items such as sitemaps, site search, and help buttons for those who have difficulty searching for specific information and tracking navigation, e.g., a help bottom may help a user to identify their current position in the website. Furthermore, a good navigation design may provide useful links to related pages on the same site and/or to external sites.

In addition, the navigation should facilitate quick and easy access to the investor relations home page and the company's annual report. We measure this feature by the number of clicks needed to access such information from the home page. There is currently considerable variation in the path length from the home page to this information, with some companies burying their financial data deep in the website while others present links to it directly from the home page. Based on our review, it is preferable that the investor relations home page is linked on the main corporate home page, and it should take less than three clicks to reach the companies' annual report.

Timeliness

One of critical points considered in website design is timeliness. Ashbaugh et al. (1999) studied the use of the internet to increase timeliness of financial reporting and stated that the relevant accounting information disclosed by companies helped decision makers to make informed decisions. To enhance the relevant accounting information disclosed, timeliness of the information released is critical. FASB (2000) viewed timeliness in the context of IBR as disclosing information before it loses its capacity to influence decisions and the dissemination of information in a manner that allows for faster acquisition of such information. Among the items utilized to measure timeliness is Really Simple Syndication and news feeds, indication of the date the website was last updated, press releases, webcasts, email alert services, financial calendars, and update alerts.

3.3.2 Website Content

The second component of the IBRQ index is website content, which is concerned with the information or data presented on a company's website. According to the IRS (2006), web content should be clear, unambiguous, timely, and relevant to the needs of existing and potential investors, both private and institutional. The index categorizes web content into two broad categories: financial and non-financial data. All attributes of financial and non-financial data are adapted from IRS (2006), IFRS, revised IAS 1, and related literature for financial statements.

Financial Data

It is essential for companies to have clear and comprehensive financial information presented on their websites. Companies are encouraged to present financial data on the first page of the website or one click away from the corporate home page instead of hidden deep in the website. Generally, the main reason most existing or potential investors visit a company's website is to access reliable and up-to-date financial information. To reflect this issue, the IBRQ index has 100 attributes to measure financial information. These attributes have been grouped into four main categories: financial statements, quarterly financial report, financial highlights, and shareholder information.

Financial statements serve as the first attribute of financial information to assess the quality of disclosure. These items were further divided into general items in financial statements: balance sheet, income statement, statement of changes in equity, cash flow, and notes to the financial statement. The revised IAS 1 that provides guidelines for the presentation of financial statements does not specify the medium used for the presentation of financial statements. However, it is understood that the requirements mainly refer to paper-based financial statements. In fact, an external auditor will ensure the financial statements prepared by companies are in accordance with the applicable accounting standards by reviewing paper-based financial statements.

At present, external auditors are not responsible for reviewing financial statements presented on a company's website, which may not necessarily be similar to paper-based financial statements. For the purposes of the present study, the IBRQ index extends the applicability of the revised IAS 1 by incorporating the applicable financial statement presentation requirements of the standard as a mean to assess web-based financial statements.

The next item measures the presentation of common items in the balance sheet, which is standard requirement to a properly separate classification of disclosures for current assets, non-current assets, current liabilities, and non-current liabilities. The index also lists several fundamental items that are normally present in a balance sheet, such as property, plant, and equipment, intangible assets, financial assets, investments, and other assets.

A similar approach was followed for income statements which only consist of five items: revenue, finance cost, taxes, expenses, and profit figure. With regard to the statement of changes of equity, the disclosure is measured by the amount of profit and loss for the period, the amount of retained earnings at the beginning and end of the year. The revised IAS 1 requires separate classification of operating activities, investing activities, and financing activities for the cash flow statement. In addition, the amount of cash and cash equivalent held at the beginning and end of accounting period should be clearly stated. Finally, notes to the financial statement should clearly disclose the statement of compliance with IFRS, the significant accounting policy, and supporting information for items presented in the balance sheet, income statement, and cash flow. In addition, other voluntary disclosure items, such as segmental reporting, is also included in the IBRQ index.

The second element utilized in the present study to measure the disclosure of financial information is the quarterly report. By disclosing the quarterly financial report on a company's website, investors may be able to make preliminary judgments about the latest financial performance. The IBRQ lists eight items to measure the disclosure quality of quarterly report on the website. Among the items is the number of quarters disclosed in the previous and current financial year. In addition, most of the quarterly reports are unaudited, thus, it is critical for a company to disclose a proper disclaimer, including forward looking statements, to reduce the risk of litigation. These disclosure statements were also part of the index.

The third element is a financial summary or highlights, which consist of summary financial data and key financial ratios. Among the items used to measure the disclosure quality of financial highlights are revenue, operating profit, earnings per share, and dividend payments. Similarly, companies should also disclose key financial ratios such as liquidity ratios, profitability, and operating ratios. All information is preferably available as comparisons over 5- to 10-year periods.

Shareholder information is the last measurement for financial information disclosed on the website. According to the IRS (2006), companies should provide an up-to-date source of stock and shareholder information. An example element considered for stock information is the existence of current and historical price quotes, trading volume, dividend history, and the availability of price charts. The IBRQ also considers analysts report and the forecasts made by analysts to be of interest to shareholders. To measure shareholder information, the index focuses on the shareholding information analysis by size, types, and geographical region. In addition, it is also focused on the availability of electronic stock trading facilities such as submission of proxy forms, online voting at AGMs, and online registration.

Non-Financial Data

The second component of website content is non-financial information. This component may become a focal point for investors as non-financial information significantly influences investors making informed economic decisions. Non-financial data was divided into six categories: general information about the company, management team, corporate governance and committee of the board,

corporate social responsibility (CSR), online trading and marketing, and auditor and AGM information. Each category is explained below.

General item disclosure on non-financial information consists of the disclosure on the nature of business, principles business activities, vision, mission, strategies, and contact information for the company. Disclosure of information on management team forms the second part. The main focus of measurement is limited to information about the chairperson, the chief executive officer (CEO), and the board of directors (BOD). These disclosures are assessed based on the existence of a photo, message, biography, and interview session content. The third element measures corporate governance disclosures, which are highly important for investors in determining the extent to which the company may uphold integrity and good corporate governance. Examples of items assessed under this category are the existence of a corporate governance report, audit committee, and nomination/remuneration committee. These categories are examined in terms of their existence, composition of directors, roles and responsibilities, and the committee charters. The fourth element assesses the existence of voluntary disclosure on CSR, which is based on the existence of a CSR policy, a statement of compliance, and graphic images. The next element is the existence of online trading and marketing information on the company website. These two items are assessed based on their existence and on proper disclaimers for the services or products offered. The last parts assessed by the IBRQ index are auditor and AGM information. A similar approach is utilized in assessing these sub-attributes, such as the existence of the items and the disclosure format in the website.

3.4 Number of Items in the Index

The IBRQ index consists of 205 items, with 34 items measuring website design and 171 items measuring website content. From the 34 items used to measure website design, 11 items measure usability and accessibility, 10 items measure navigation, and 13 items measure timeliness. From the 171 items used to measure website content, 100 items measure financial data and 71 items measure non-financial data.

Based on the structure of the IBRQ index, financial data consists of several elements, such as financial statements, quarterly reports, financial highlights, and shareholder information. From the 100 items used to measure disclosure quality of financial data, 59 items are assessed for financial statements, of which 12 items are used to assess general items of the annual report disclosure, 22 items for the balance sheet, 5 items for the income statement, 4 items for the statement of change in equity, 5 items for the cash flow statement, and another 11 items for notes to the financial statement. Then, another 8 items assess disclosure quality of quarterly financial reports. The third element is financial highlights, which is measured using 11 items. The last element of financial data is shareholder information. A total of 22 items covering shareholder information are used to assess the disclosure quality.

Consistent with financial data, the non-financial data also comprises several elements. From the 71 items used to measure non-financial data, 9 items measure

general items in the company profile, 21 items measure the disclosure quality for the management team, 19 items measure corporate governance and the board committee reports, e.g., audit committee, nomination/remuneration committee. Then, another 6 items are measure the disclosure quality of the company's CSR. For online trading and marketing, another 10 items are utilized. The last element assessed from non-financial data is the auditor and AGM information. To assess the disclosure quality of this information, a total of 6 items are utilized.

As reported previously, there is no commonly used theory to determine the number of items for any disclosure index (Hooks et al., 2002). Thus, there are a large number of items used in the index among earlier studies. For example, Barrett (1976) used only 17 items in his index, and Cooke (1989) used 224 items. Other studies, such as Benjamin and Stanga (1977), Chow and Wong-Boren (1987), Wallace (1988), Malone (1993), Cooke (1993), Hossain et al. (1994), Meek et al. (1995), and Fergusson et al. (1999) included 70 items in their indexes. In addition, Celik et al. (2006) used 164 items while Davey and Homkajohn (2004) used only 44 items. Thus, the total of 205 items used in the IBRQ index is consistent with the range of items considered in the literature.

3.5 Assigning Weights for IBRQ Index

There are two main approaches concerning the use of classification items used to index assess IBR practices: weighted and unweighted approaches. This section reviews the literature for both approaches, including the strengths and limitations of both approaches. In an effort to improve and test existing research on the implication of both approaches, the present study utilized both approaches for analysis. A survey of a sample of users of financial statements is used to assign weights and is presented at end of this section.

3.5.1 Previous Studies on the Use of Weights

Previous studies highlighted two widely used methods to construct the scoring or disclosure index in measuring the financial disclosure quality: weighted and unweighted indexes; see Camfferman and Cooke (2002), Singhvi and Desai (1971), Naser et al. (2002), and Alsaeed (2005). In fact, the same method or approach has been used to develop indexes to measure the quality of business disclosure over the internet; see Davey and Hamkajohn (2004), Cheng et al. (2000), Geerings et al. (2003), and Celik et al. (2006).

Under an unweighted index, items are scored using dichotomous variables, where zero is awarded for non-disclosure items and one is awarded for disclosure items. In contrast, the weighted index is based on a subjective importance rating either given by the researcher or by a number of surveyed users of financial statements. However, the weighted index has been criticized by some studies as inherently subjective in assigning weights since other researchers or respondents they may have different preferences (Chang, 1983; Cooke, 1989). However, Coy and Dixon (2004) claimed that the unweighted index also suffers from subjectivity.

They argued that even though there are significant differences in terms of relative importance of each disclosure item stated in the index, all disclosure items are assigned equal weights, thus effectively based on an equally subjective rating system.

Singhvi and Desai (1971) assigned weights to the index items. They indicated that the weights were assigned to note the distinction in terms of degree of importance of each item. This is espoused by the study conducted by Davey and Homkajohn (2004), where they had extended the index developed by Cheng et al. (2000). In their study, index criteria were divided into four categories consisting of content, timeliness, technology, and user support. The authors found that web content is more important, and thus they assigned the highest weight for content (40%). The remaining attributes were assigned equal weights (20%).

Bollen et al. (2006) also utilized the weighted index in their study by extending the study in Beattie and Pratt (2003). Bollen et al. (2006) utilized a research instrument developed by Geerings et al. (2003) to measure the quality of corporate investor relation websites. However, Bollen et al. (2006) incorporated weights in their instrument as proposed by Beattie and Pratt (2003). The attributes of instrument were divided into 5 categories: (1) annual and interim reports, (2) press releases and further information on the internet, (3) presentation advantages of the internet, (4) direct contact via email and mailing lists, and (5) video and audio records and online participation in meetings. According to Beattie and Pratt (2003), users of financial statements favor more toward presentation advantages of the internet such as the use of electronic format (e.g., pdf, spreadsheet and xbrl, use of hyperlinks) and audio-video recording and online participation (e.g., audio-video teleconferences, webinars, and live online participation). These categories are weighted most (weight factor 2) in the index. Press releases and further information on internet services and direct contact via email are weighted moderate (weight factor 1.5). This is because users show moderate preference to timeliness of internet reporting in the form of continuous updating and email alert. The annual report and interim report is a basic feature in an investor relation websites; thus it carries the least weight (weight factor 1).

Hooks et al. (2002) argued that weights were preferable for their index. They believed that the use of weights may encourage a user to focus on their area of research and acknowledged that disclosure of some items are more important than others. This implies that the item disclosed with no weight carries an equal degree of importance to the score. In order to reduce the subjectivity or bias in allocating the weight to each item as was argued by some researcher (e.g., Chang et al., 1983; Cooke, 1989), Hooks et al. (2002) conducted a survey that required the respondents to allocate particular weights to each disclosure item by sending questionnaires to 15 selected respondents representing 15 stakeholder groups of auditors, lenders, the central government, major electricity user groups, academia, financial analysts, financial reporters, consumers, advocates, preparers, directors, consultants, and electricity distribution company employees. A further interview with 15 of the above panels was conducted to validate and comment on their reasons for how they allocated weights to each disclosure item.

Some researchers allocated a portion of weights not only to the main attributes but also to sub-element or items in each attribute in an effort to measure quality of disclosure; see for instance Copeland and Federicks (1968), Buzby (1975), Barrett (1977), Wiseman (1982), Robbins and Austin (1986), Wallace (1988), Rowe and Giroux (1986), Tong et al. (1990), Tower et al. (1995), and Carson and Simnett (1997). In contrast, some studies decided not to utilize weights in the index and prefer to use unweighted index in which items of disclosure are assumed to be equally important. This approach was adopted by Camfferman and Cooke (2002), Cooke (1998), Bonson and Escobar (2006), and Robbins and Austin (1986). Normally, under an unweighted index, the score was computed as the ratio of actual score for a particular company divided by the maximum score (Alsaeed, 2005). But Bollen et al. (2006) computed the unweighted score using the total of all categories' scores.

However, evidence from Wong-Boren (1987), Wallace and Naser, (1995), and Spero (1979) indicated that the use of weights does not significantly alter the scoring result. In addition, Robbins and Austin (1986) and Firth (1980) found that weighted and unweighted index showed similar results. Thus, it is part of present study's objective to test the impact of both weighted and unweighted indexes in this literature.

3.5.2 The Procedure for Assigning Weights

The present study adopts the methodology developed by Hooks et al. (2002) as a basis for assigning weights to the IBRQ index. A survey questionnaire was constructed and emailed to a sample of users of financial statements, including bankers, auditors, finance executives from commercial industry, accountants, academia, regulatory agencies, and students. The survey aimed to identify the weight for each attribute in the IBRQ index and was divided into three sections. The first section introduces and highlights the survey's objectives. The second section requires the respondents' personal information on gender and employment category. The third section provides brief instructions and an example for how respondents should complete the survey. The respondents were reminded to return the completed survey by January 31, 2008. The distribution of the above survey was made possible via email, traditional mail, and direct administration. The distribution and direct administration of the survey was executed on December 17, 2007. The survey was emailed to various users of financial statements with mailing addresses obtained from Universiti Tenaga Nasional's (UNITEN) industrial training database.

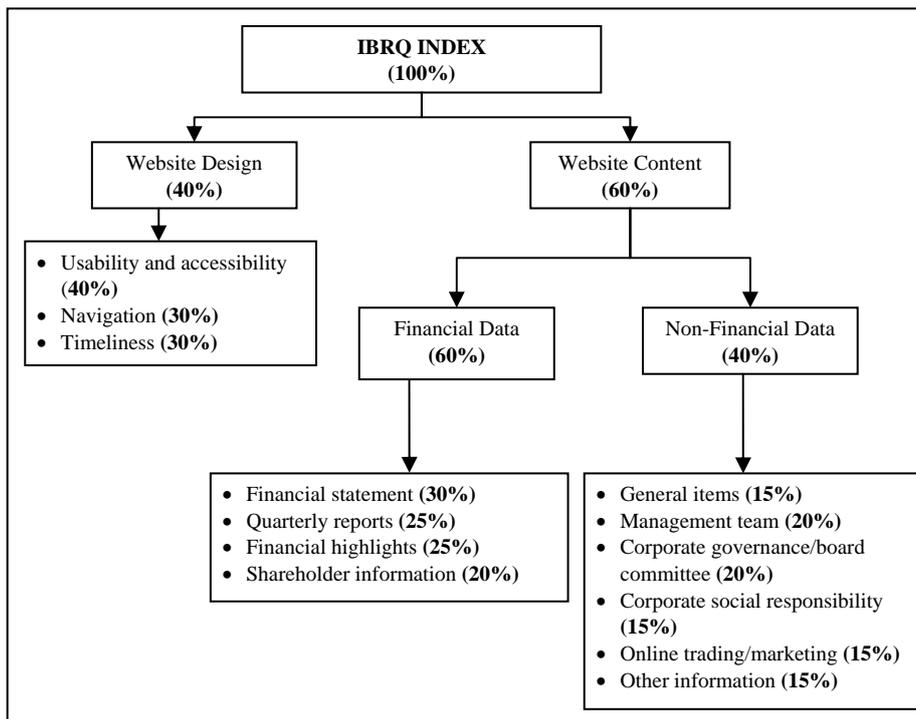
In addition, 300 copies of the survey were mailed to 30 UNITEN's industrial training students related to various commercial industries and accounting firms on the date of investigation. Each student was provided with 10 copies of the survey and asked to serve as an agent for data collection in their respective organization. A brief explanation was given to students to whom they should distribute the survey before the students went for industrial training on December 12, 2007. At the same time, 20 copies of the survey were personally administered by the researcher to final year Bachelor of Accounting and Bachelor of Business Administration students at

UNITEN. In total 450 copies of the survey were distributed. As of January 31, 2008, a total of 97 completed copies were received.

Hooks et al. (2002) they initially calculated results of their survey by summing the weights assigned to the disclosure items by the 15 panelists and divided the total by 15. It implies that the higher the score, the greater the importance of the items. In order to validate the proposed weights, the mean was then compared to the weight given by other researchers for similar items by calculating a normalized mean.

In contrast, the results of our survey were first analyzed using basic statistical tests to determine the mean and median of each attribute. There were few extreme cases involving a value of 100 or 0 being assigned to particular attributes in the IBRQ index. Thus, the use of a mean as a basis to determine a weight suggested by Hooks et al. (2002) may not be suitable for the present study. Considering the limitations of mean, the median value was used as a basis to determine the weight of individual attribute in the IBRQ index. The results, reflecting the weights (as percentages) for every attributes are presented in Figure 2.

Figure 2. Final Weights Assigned



Based on the results obtained, it was found that respondents perceived that the web content should be assigned higher weights (60%) compared to the website design (40%). This result is consistent with that obtained by Davey and Homkajohn

(2004) in which web content was assigned the highest weight compared to another attributes. Thus, this weight was utilized in the present study.

4. Validity and Reliability of Index

The final step involved in the development of the IBRQ index is to test the validity and reliability of the index. This step is important since the quality of the research instrument is a focal point for this study. An instrument is valid when it is able to measure what it is supposed to measure, whereas reliability refers to the consistency of measurement. This means that the instrument is reliable when it is able to produce consistent results if used in other studies, though it may fail to accurately measure the construct (i.e., it may fail a test of validity). However, if the instrument is able to measure the construct, it will certainly provide consistent results (John and Ferla, 2003). This section then highlights the procedures to assess validity and reliability of the IBRQ index.

4.1 Expert Review

The evaluation of the IBRQ index validity can be performed by requesting the recommendations from experts in the field of study (Sheridan et al., 2000). Dinius and Rogow (1988) argued that expert judgment is acceptable, though obviously represents an inexact science. An expert is someone who possesses special knowledge about a specific subject. This view is supported by Singhvi and Desai (1971) who discussed the appropriateness of items in the index with several individual experts in that field in an effort to measure validity of the index. Our survey was sent to several prominent researchers via email since they knew more about this topic than most people would. Examples of the experts were Andrew Lymer, Roger Debreceeny, Laury Bollen, Tehmina Khan, and Muhd Kamil. Reasons for sending the index to these prominent researchers was to seek their opinions and recommendations on the appropriateness of items and the assignment of weights for each attribute in the index.

All the experts agreed that the items considered in the IBRQ index are adequate to measure the quality of internet business reporting practices. To ensure the appropriateness of classification of items in the IBRQ index, some experts suggested that several items previously placed under non-financial data attribute be reclassified as financial data and vice versa. Shareholder information and shareholder services, initially classified as non-financial data, were reclassified as financial data together with stock information. Conversely, corporate governance, CSR, and board committee information, initially classified as financial data, were reclassified as non-financial data together with other report items. Furthermore, the information about the chairperson, CEO, and BOD of the company has been specifically grouped under the management team item. (This item was initially considered as a sub-element to the general items under the non-financial data attribute.)

4.2 Rater Reliability Test

The assessment of the IBRQ index reliability can be performed through a rater reliability test, which is very important in a study that utilizes content analysis (Geerings et al., 2003; Hamid, 2005). FASB (2000) suggested that rater reliability, which involves humans as a part of measurement procedures may be used in IBR studies by asking others to evaluate the same website and compare their results with the researcher's results to determine consistency of the results. This is because some websites did not use the same terminology or groupings or perhaps some attributes were so deeply buried in the website that the information could not be found. However, FASB (2000) did not conduct the rater reliability test in their study due to time constraints.

Geerings et al. (2003) and Hamid (2005) also utilized rater reliability or coder reliability in their studies. In their studies, the authors served as coders to determine the categories of attributes. By using the checklist instrument, all authors reviewed a sample of information presented on websites independently. The coded data were compared to determine any discrepancies. If there were any discrepancies, they were discussed by all authors for consensus before assigning a code.

Various methods have been used in the literature to perform rater reliability tests. The primary objective of each is to identify differences between rater. We adopted the suggestion made by FASB (2000) to extend the procedures to include statistical analysis. Consequently, we rate reliability based on differences in total scores of the IBRQ index between the researcher and other independent raters. By analyzing the total score of the IBRQ index, we indirectly compare differences between various raters and researchers concerning their assessments of each website. This is possible as the procedure involved independent raters to assess selected websites and indicate their scores in the IBRQ index. Details of the testing procedure, known as the multi-raters reliability test, are as follows.

A total of 154 final year Bachelor of Accounting students from UNITEN were invited to be independent raters in this analysis. However, the final sample was of independent raters was restricted to 25 students to represent 10% of the total study population. Five companies from each country were randomly selected using SPSS. Each independent rater was assigned one company to assess. On February 19, 2008, all raters were grouped in one computer lab at UNITEN. However, on the of assessment day, only 24 independent raters turned-up (one rater could not participate due to personal reason). Each rater was provided with the IBRQ index booklet with the name of a company and its web address. The raters assessed the company websites from 9:00 am until 12:30 pm MST.

A briefing session with the raters was conducted two days previous to the assessment. During the briefing session, which was attended by all the raters, the researcher introduced and demonstrated the assessment procedures using the IBRQ index. The index was provided to the raters earlier to help them familiarize with the index. In addition, all the questions raised by the raters were answered. To avoid any

unnecessary influence on the assessment process, the researcher was not physically present during the session.

The multi-rater analysis was used to identify differences in the total score assessed by the researchers and independent raters. In the present study, the IBRQ index total scores of the 24 companies assessed by independent raters were compared with those assessed by the researcher. The comparison of the scores involved two stages: the first stage analyzed the differences between the total score of the IBRQ index and the second stage involved a comparison of scores for each attribute in the IBRQ index.

The analysis tests the null hypothesis that there is no significant difference between the IBRQ index score assessed by researcher and the independent raters. As the comparison involved only two groups (i.e., the researcher and the independent raters), the most appropriate statistical test is the independent sample *t*-test provided the distributions are approximately normal. The Kolmogorov-Smirnov (K-S) test was used to check normality of the data. If the data were not normally distributed, the Mann-Whitney test is more appropriate than the independent sample *t*-test.

A total of 18 variables from the IBRQ representing the attributes of the index were extracted. A list of these variables is presented in Table 3. Based on a 5% Type I error probability in the K-S test for normality, we chose the appropriate test statistic. We found evidence against a normal distribution for financial statements, quarterly reports, shareholder information, management team, CSR, and other information. Therefore, the Mann-Whitney test was used to test these index items while the independent sample *t*-test was used to test the other items.

Table 3. Summary of Multi-Rater Result

No	IBRQ Index Item	Statistical Test	P-Value
1	website design		0.729
2	usability and accessibility		0.950
3	navigation		0.476
4	timeliness		0.324
5	website content		0.360
6	financial data	T-test	0.587
7	financial highlights		0.947
8	non-financial data		0.207
9	general items		0.646
10	corporate governance		0.898
11	online trading/marketing		0.923
12	total IBRQ score		0.500
13	financial statement		0.081
14	quarterly report		0.655
15	stock/shareholder information	Mann Whitney	0.626
16	management team		0.187
17	corporate social responsibilities		0.966
18	other information		0.054

The next step is to make a comparison between two sets of variables that represent the IBRQ index score as assessed by the researcher and independent raters. A summary of the results of both independent sample *t*-test and Mann-Whitney test are presented in Table 3. Because these results are exploratory in nature no adjustment was made for multiple comparisons. The results indicate that there is little evidence of difference with regard to the scores assessed by the researcher and those assessed by the independent raters. Note however, in light of the small, highly selective, convenience sample on which these results are based, that additional tests of rater reliability are necessary before it can be concluded that the IBRQ index is reliable for assessing the quality of IBR practices.

5. Conclusion

The aim of this paper was to describe the development of an index called the IBRQ index which was used to measure the quality of business reporting on the internet across five countries. The development of the IBRQ index to assess the quality of business reporting is described based on a thorough taxonomy of web design and web content. This development is based on extensive review of relevant literature and informed by an expert panel of prominent researchers. We consider both weighted and unweighted versions of the index, and describe the results of a survey developed to inform a choice of weights. We found that web content was perceived to be most important, and a multi-rater reliability test based on a nonrandom sample found a high degree of agreement between the researcher's scores and those of independent raters for selected IBRQ index items. However, larger statistical samples are necessary before one can conclude that the IBRQ is a valid and reliable index.

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