An investigation into Scottish urban and rural small business website quality

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Abstract
The current paper documents a study of the usefulness and quality of websites of small firms in urban and rural areas in Scotland using an adapted Web Assessment Index (WAI), as developed by Gonzalez and Palacios (2004). Findings include that website quality was comparable between urban and rural small businesses. The best designed sites identified were rich in content, easily accessible and had fast download speeds. While the WAI was useful in terms of assessing quality when comparing like with like, the ability of the WAI to compare quality between companies of different sizes was limited. Therefore comparison of quality of websites in this study with those of larger firms in previous studies were inconclusive. Notwithstanding this, the study finds that the WAI would be a useful tool for small firms in terms of encouraging business owners/managers to focus on the various factors that impact on the quality and effectiveness of their websites. It is suggested that this usefulness may be more pertinent in rural areas as a result of greater resource disadvantage and remoteness from expertise, relative to urban firms.
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Introduction
The current paper documents a study of the usefulness and quality of websites of small firms in urban and rural areas in Scotland. Firms within several industry sectors in rural and urban locations were selected and their websites rated according to an adapted Web Assessment Index (WAI), as developed by Gonzalez and Palacios (2004). The aim of the study is to test to what extent the WAI is useful for small firms’ website quality management and to investigate whether website quality in rural and urban areas varies. The paper commences with a review of the literature in terms of internet participation amongst small firms, the importance of website quality, and provides a description of and rationale for using Gonzalez and Palacios’ WAI. The Methodology Section provides details of the sample used and the analysis undertaken. The paper presents findings from the study and concludes with a discussion of these and the implications for practitioners.

Internet use in the small firms sector
It is still the case that small firms are less likely to be online than large firms (Fillis, et al., 2003; Jones, et al, 2003; Ramsay, et al, 2003). Reasons for this are various, but include the cost and availability of ICT expertise in the context of limited resources (Matlay and Addis, 2003), and the time and effort required for acquiring new ICT skills (Lawson, et al, 2003). Real or perceived lack of need is suggested as another contributory factor; since many small firms trade locally they are often well-served by conventional business methods, while others who might benefit from ICT use may not be aware of the potential benefits for their firms (Daniel, 2003; Ramsay, et al., 2003). A decade ago rural small firms were found to be even less likely than urban small firms to engage with the internet (e.g., Smallbone et al. 2002). More recently this trend has been observed to be turning, as reported in Deakins, et al. (2004), Dwelly et al. (2005) and Telford (2006). The more recent upsurge in rural small business take-up is likely to be associated with the modern ubiquity of the internet; perhaps experiences of common applications and facilities based on personal internet use leads to adoption as business tools thereafter. Certainly, Forman, et al. (2005) found in their survey data that innovative and enhanced technology use was more characteristic of urban firms compared with common internet technology use – that which has been mainstreamed by proliferation over time and standardised by greatest use – in rural firms. Despite this, the lower (than large firms) use of the internet in rural firms is said to be for the same reasons as for urban ones, but the barriers are more likely to be amplified as a result of the remoteness and peripherality characteristic of rural locations (Galloway, et al., 2011).

In rural areas the itinerant problems of remoteness prevail. Though vastly improved in recent years, access to high speed internet connectivity can be erratic (Galloway, 2007). As noted, for small firms generally availability of IT expertise is identified as a supply-side barrier to internet use (Lawson et al., 2003), and particularly so in rural areas (Thomas, et al. 2002; Galloway and Mochrie, 2005). Grant (2003) observes, in her study of ICT use and female rural business ownership, that limited internet use is symptomatic of general rural “skills deficiency in terms of other business skills”. Leatherman (2000, p. 10) explains that this is associated with the typical rural demographic, where compared with urban areas, rural areas have populations with “lower levels of income and educational attainment and higher proportions of the
 elderl}y and disabled… all of these factors are known to influence computer access and use”. Matlay and Addis (2003) note that SMEs, both urban and rural, are most likely to access expertise only when subsidized. This may comprise a greater problem in rural areas as a result of fewer competing specialists, thus allowing for even higher prices, and a role for policy in terms of raising awareness and skills has been identified in several studies (e.g., Smallbone et al., 2002; Grant, 2003). As with urban small firms, perceived lack of need is also suggested in several studies as a barrier to internet adoption amongst small firms (Ramsay et al., 2003). Galloway, et al. (2011) find that in rural areas particularly, many firms are most concerned with local markets and there may be a genuine or perceived lack of need for internet presence (also Huggins and Izushi, 2002). However, with internet diffusion for consumer and social purposes now widespread, many small firms, including rural small firms, are engaging in internet activity in order to be included and competitive in the modern business world.

Cox and Dale (2002) note that the means by which firms obtain an internet presence varies from professional to amateur. In the small firms sector it is likely that the proportion of amateurs is greater than in the large firms sector, and that the number of amateurs in the rural small firms sector is greater still. Certainly, there is some evidence that small firms’ websites tend to be lower quality than large firms websites (van Iwaarden, et al., 2003). While acknowledging the presence in both urban and rural areas of highly skilled enthusiasts and cutting edge professional specialists, even where professional internet service providers are used, we might hypothesise that, overall, the skills and expertise available in the rural small firms environment are likely to be less developed or up to date than in the urban small firms sector. Since the current paper seeks to investigate if variation in website quality exists between urban and rural small businesses, the paper now turns to examining the reasons why high quality internet use is necessary for small firms in both urban and rural areas.

The online business environment
Cox and Dale (2002, p.862) note that “the main reason customers go onto the internet is to find information or buy a product or service with an emphasis on convenience and speed”. They also note that the aim of a website “is to provide a reason for the customer to return” (p. 972) and this identification of affording customer loyalty is repeated throughout the literature (e.g., Galloway and Richards, 2009; Fan and Tsai, 2010). While important for all firms, for small firms, with their smaller market share, repeat business can be critical. To achieve it, an essential component is an attractive and effective interface: the firm’s website. van Iwaarden, et al. (2003, p.948) claim that a firm’s website needs to be high quality as it must replace the human interaction afforded by offline trading: “the absence of these factors has to be replaced by better performance on ‘new’ specific web factors”. The now commonplace availability to customers of online purchasing has raised the bar further and they expect a fast and efficient experience (Cox and Dale, 2002; van Iwaarden, et al., 2003).

Hernandez, et al. (2009, p. 363) claim that “the better a website, the greater the probabilities of success in the virtual market”. This presupposes, however, that the virtual market – as a global, time-freed network – is the main driver of internet participation. Galloway, et al. (2011) argue that this is not necessarily the case and that for many rural firms internet participation is more about inclusion in the virtual
world in the context of continuing to serve local markets via this extra and increasingly demanded medium, rather than for increasing markets or market share. Whatever the rationale for a firm going online, there is much consensus in the literature that websites must be of high quality to most advantage firms. However, there is a lack of clarity about what quality is being referred to and a variety of different measures have been developed for quality management (e.g., Aladwani and Palvia, 2002; Cox and Dale, 2002). Yang, et al. (2005, p.576) explain the “considerable confusion” as a consequence of different types of websites (such as online stores versus comparison sites) and different itinerant priorities (such as the sale of physical products, the distribution of these, the sale of information, the sale of services with various delivery implications). Therefore, as there is infinite variation amongst the value propositions of firms, so is there variation in the ‘best’ way of presenting and selling that effectively online. However, within these measures similarities are observed also, and it is possible to extrapolate what it is that, in general, affords a ‘good’ website.

Getting found – being readily accessible from search facilities – is one of the most important issues to a firm. Other common items associated with good websites are fast download speeds, fast and efficient responses to customers, security and trust, ease of use or navigation, personalisation capability, and information quality or content (van Iwaarden, et al., 2003; Yang, et al., 2005; Galloway and Richards, 2009; Fan and Tsai, 2010). For this last item, while there is general consensus that content should be up to date, relevant and attractive to customers (Hernández, et al., 2009), Cox and Dale (2002) warn that often too much focus on aesthetics can for some firms be at the expense of the other, equally critical issues, a view expressed also by Fan and Tsai (2010). Certainly, as Gonzalez and Palacios (2004, p. 314) point out, for some small firms website are created “with only limited resources in terms of time and money and as a result…many are poorly designed”. In response to this, several measures of website quality that incorporate commonly identified critical elements have been created.

Measuring Website Quality
Recent studies of website quality have focused on measuring several dimensions such as navigability, speed, content and interactivity (e.g. Huizingh, 2000; Buenadicha et al., 2001; Liu and Arnett, 2000; Zhang and von Dran, 2001; Palmer, 2002) This stream of research has stimulated the construction of instruments like comQ, eSQ, SITEQUAL and WEBQUAL. There are, however, several limitations to these measures. First, key dimensions identified are limited as most are exploratory or conceptual in nature (Yanga et al., 2005; Hernández et al., 2009). Second, studies using these measurements can be compromised in the context of multiple definitions and constructs being employed (Aladwania and Palvia, 2002; Hernández et al., 2009). Lastly, the dimensions considered may not be applicable in all cases or for all firms (Hernández et al., 2009; Yanga et al., 2005).

The work of Gonzalez and Palacios (2004) has attempted to rectify some of the problems afflicting research into website quality. The authors identify accessibility, speed, navigability and content quality as being key dimensions affecting website quality, regardless of firm context. Their WAI therefore measures website quality globally, i.e. it can measure the quality of a company’s website irrespective of
industry or location and can thus afford objective comparison across industries and sectors (Hernández et al., 2009).

**Web Assessment Index (WAI) dimensions**

The first dimension **accessibility** describes how easy it is for current and potential users to access and identify a company’s website. Hernández et al. (2009) state that a high level of traffic is important since search engines like Google give a website an elevated priority for users actively searching for relevant information related to it. Measurements of accessibility can be obtained from the search engine positioning of the website and site popularity (Gonzalez and Palacios, 2004). The second dimension is **speed**. A range of studies highlight that a positive correlation exists between website loading time and user satisfaction and that fast loading is essential for customer willingness to finalise online transactions (e.g., Cao et al., 2005; Weinberg, 2000; Yen et al., 2007). The third dimension is **navigability**. Numerous studies have determined that websites must be easy to use and enable users to undertake searches via site maps, internal search engines or the provision of a permanent site menu (e.g., Clyde, 2000; Hudson et al., 2000; Robbins and Stylianou, 2003). Hernández et al. (2009) state that if it only takes a few clicks to locate the product required, this will enhance user satisfaction and customer loyalty. The fourth dimension is **content** which comprises three basic functions: informative, transactional and communicative (Hernández et al., 2009). The informative aspect relates to the precision, relevance and timeliness of the data provided. Much of this data will relate to a company’s background, activities and product or service descriptions, etc. The transactional aspect refers to the ease of performing an online purchase. Hernández et al. (2009) include the facilities that support the transactional function such as financial intermediaries involved and the number of steps needed to complete a purchase. The communicative aspect relates to the readiness of a company to assist its users and to encourage a continuous exchange of information between all of the parties involved (Wan, 2000; Chen and Yen, 2004).

**Research Questions**

While both rural and urban small firms suffer from resource and skills deficit relative to large firms, since rural small firms are more disadvantaged than urban small firms in these respects we might expect that the quality of their websites be correspondingly lower. Similarly, since the literature identifies that the reasons for internet participation for rural small firms is less likely than for urban firms to be driven by growth orientation, we might expect rural small firms’ websites to be less sophisticated than those of urban small firms. Thus Research Questions 1 and 2 are generated.

RQ1: Do Scottish urban and rural small business websites differ in terms of their levels of quality as measured by Gonzalez and Palacios’ WAI?

RQ 2: How does the website quality of Scottish small businesses compare against other businesses previously investigated by Gonzalez and Martinez’ WAI?

A practical output from this study was to identify ideas and practices that can improve rural small business websites. Certainly discovering how small businesses can optimise each category of website quality: accessibility, speed, navigability and site content would be valuable. Based on the aforementioned argument it would be useful to determine:
RQ3: To what extent do the relationships between the different categories of website quality: accessibility, speed, navigability and site content, afford effectiveness to small Scottish firms?

Gonzalez and Palacios developed their WAI with the large firms sector in mind. Subsequent studies using the WAI have tested websites on similar larger organisations. Since the authors claim that the WAI is useable across industries and sectors, we would expect that it is useful also in the small firms sector. Therein prompts the generation of Research Question 2.

RQ 4: How useful is Gonzalez and Martinez’ WAI in terms of measuring the quality of websites in the small firms sector?

Methodology

Sample
Three steps were undertaken to obtain the sample for this study. First, the terms rural and urban were defined to clarify the nature of the small firm participants involved. Rurality is defined as comprising a mainland settlement of fewer than 10,000 residents (Defra, 2004), however, Scotland’s rural areas are very diverse, with some areas very isolated and others relatively well-served by an infrastructure that affords a proximity to urban centres. To account for the diversity of “rural” Scotland a further criterion to help to determine whether the physical address of the business’s website was rural or urban was included. This further criteria specified that if the website’s quoted physical business address was at least sixty minutes from an urban area (i.e. mainland settlement of more than 10,000) either by car or boat then the researchers classified it as a rural location. Conversely a firm was defined as being within an urban location if its website’s physical address was situated in a settlement of more than 10,000.

Second, Wikipedia (http://en.wikipedia.org/wiki/United_Kingdom), the free online encyclopaedia, was used to alphabetically identify a list of Scottish cities, towns and villages. Scottish cities, towns and villages were straightforwardly categorised into either rural or urban locations using population information from the 2001 United Kingdom Population Census data and geographical information provided by the Wikipedia site. In addition, the sixty minute test previously described was employed for categorisation purposes to help determine rural and urban settlements. The outcome of this categorisation process was the creation of two alphabetic lists detailing urban and rural Scottish settlements respectively. To make the selection of small firms operating a website in either of these two locations as random as possible every third settlement was investigated. If the settlement did not possess the necessary characteristics the next immediate settlement on the list was selected.

Third, the United Kingdom’s Yellow pages online directory of business services (http://www.yell.com/) was used to locate small businesses employing websites within relevant Scottish locations. The online directory’s search function enabled the researchers to classify potential small businesses by location and their products and services offered.
Through trial and error the researchers discovered that employing separately the search terms “services” and “accommodation” within the products and services enquiry box alongside the settlement location enquiry box identified the greatest number of company results. For each settlement location the Yellow Pages search function provided the researchers with anything from zero to several hundred companies listed in alphabetical order. The researchers went through the company results one-by-one to discover if the firm was both small in size and possessed its own website. Conveniently the Yellow Pages search results provide both traditional contact details and a web address if a website is available. Firms’ websites were then visited to establish the number of employees working within them. To be considered a small business the company needed to employ between 0 to 49 employees (BIS, 2011). For the most part this was a straightforward exercise as most company websites provided its employee numbers. Certainly many small business websites used their size as a favourable point of difference from larger rivals. If there was any doubt about employee numbers the company would be rejected and the next Yellow Page result investigated. The above process was repeated until a sample of twenty urban and twenty rural small business websites was collected, providing a total sample size of forty. Motor vehicle parts retailers, household appliance repair firms, Bed and Breakfasts, hotels, food and drink retailers, gift shop retailers, car hire ventures, business consultants and landscape gardeners were just some of the small business websites analysed. The general characteristics of the sample are detailed in Table 1.

**Procedure**

Information about website quality was collected during the period between February and April 2011. Four researchers evaluated each business venture’s website using an adapted Web Assessment Index questionnaire (see Appendix 1). They also measured the physical performance of each business venture’s website by using specialist performance evaluating websites like Linkvendor.com, Linkpopularity.com, prchecker.info, pagespeed.googlelabs.com and seocentro.com. If any discrepancies arose when analysing a website’s characteristics, a further round of evaluation was undertaken to ensure agreement amongst the researchers. In an attempt to minimize subjectivity, the four researchers received very precise guidelines for employing the Web Assessment Index questionnaire. Liao et al. (2006) state that the validity of the results obtained from this rigorous checking procedure is verified by similar previous studies.

Given the study’s exploratory nature a sample of forty was considered to be sufficient to explore any relationships between variables or differences between the qualities of business websites employed. Apart from employing the Web Assessment Index, several non-parametric techniques such as Mann-Whitney U Test and Spearman’s Rank Order Correlation were used for data analysis in this study. The sample’s small size and the categorical nature of the data collected meant non-parametric techniques were required for data analysis purposes.
Table 1: Description of sample

<table>
<thead>
<tr>
<th>Business type</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation</td>
<td>4</td>
</tr>
<tr>
<td>Retail/Services</td>
<td>16</td>
</tr>
<tr>
<td>Urban small businesses</td>
<td>20</td>
</tr>
<tr>
<td>Accommodation</td>
<td>10</td>
</tr>
<tr>
<td>Retail/Services</td>
<td>10</td>
</tr>
<tr>
<td>Rural small businesses</td>
<td>20</td>
</tr>
<tr>
<td>N</td>
<td>40</td>
</tr>
</tbody>
</table>

**Instrument**

To apply the Web Assessment Index each researcher answered a series of self-assessment questions (see Appendix 1) and measured the physical performance of each business venture’s website. The various questions asked and website characteristics measured provided the necessary data for evaluating the importance of the four factors seen as being critical to the quality of a firm’s website, i.e. accessibility, navigability, speed and content. Like Gonzalez and Palacios (2004) and other studies (Bauer and Scharl, 2000; Buenadicha et al., 2001; Hernández et al., 2009; Gonzalez and Palacios, 2004), this study weighted the question responses obtained for each factor on a scale from 0 to 100; the greater the number, the more important the factor. The study also weighted each of the four factors according to the formula used by other studies and agreed by independent experts (as did Buenadicha et al., 2001; Gonzalez and Palacios, 2004). Content quality was assigned a rating of 50 points, the highest weighting amongst the four factors, as it was identified as being critical for performing electronic transactions. Both navigability and accessibility were allocated 20 points each and 10 points were allocated to speed. This consistent utilisation of the same weightings means the final index produced by this study could be compared with other industries and companies active in the e-market.
Results

Website Quality Compared
Table 2 presents summary data on the results obtained from calculating the Web Assessment Index for Urban and Rural small businesses. The results show that the Indexes of both urban and rural small businesses are very similar. Correspondingly the results obtained under each of the broad factors identified for each location: accessibility, speed, navigability and site content were comparable. Indeed a Mann-Whitney U test indicated that rural and urban websites do not differ in terms of their website quality, $U=192$, $z = -.22$, $p = .83$, $r = .03$. Rural websites had an average rank of 20.10, while urban websites had an average rank of 20.90. Mann-Whitney U tests for the other factors: accessibility, navigability, content and speed also illustrated that there were no differences between the website quality of Scottish rural and urban small businesses (see Table 3).

Table 2: WAI values for the Rural and Urban Small firm websites

<table>
<thead>
<tr>
<th>Location (number of firms)</th>
<th>Content</th>
<th>Navigability</th>
<th>Accessibility</th>
<th>Speed</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban small firms (20)</td>
<td>39.67</td>
<td>49.23</td>
<td>22.50</td>
<td>70.60</td>
<td>41.24</td>
</tr>
<tr>
<td>Rural small firms (20)</td>
<td>37.50</td>
<td>52.69</td>
<td>23.50</td>
<td>72.20</td>
<td>41.21</td>
</tr>
<tr>
<td>Total</td>
<td>38.58</td>
<td>50.96</td>
<td>23.00</td>
<td>71.40</td>
<td>41.22</td>
</tr>
</tbody>
</table>

Note: Each factor was measured on a 1-100 scale.

Table 3: Summary of Mann-Whitney U Tests

<table>
<thead>
<tr>
<th>Factors</th>
<th>U</th>
<th>$z$</th>
<th>$p$</th>
<th>$r$</th>
<th>Average rank for Urban websites</th>
<th>Average rank for Rural websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>192.5</td>
<td>-.21</td>
<td>.83</td>
<td>.03</td>
<td>20.88</td>
<td>20.13</td>
</tr>
<tr>
<td>Speed</td>
<td>178.5</td>
<td>-.58</td>
<td>.56</td>
<td>.09</td>
<td>21.58</td>
<td>19.43</td>
</tr>
<tr>
<td>Navigability</td>
<td>148.5</td>
<td>-1.51</td>
<td>.13</td>
<td>.24</td>
<td>23.08</td>
<td>17.93</td>
</tr>
<tr>
<td>Content</td>
<td>176.0</td>
<td>-.66</td>
<td>.51</td>
<td>.10</td>
<td>19.30</td>
<td>21.70</td>
</tr>
</tbody>
</table>

To evaluate the usefulness of Gonzalez and Martinez’ WAI the study compared the WAI of Scottish small business websites with: (1) the WAI obtained by the top 200 Spanish firms’ websites; (2) the WAI for the Spanish retail trade industry, since many of the Scottish small businesses were closely linked by the nature of their products.
and service sold (See Table 4). These Spanish company indexes were already calculated by Gonzalez and Martinez (2004), so their independence and reliability is assured. The results in Table 4 show that Scottish small firms did not obtain scores greater than the Spanish firms in any of the categories: accessibility, navigability, content and speed. The download speed and accessibility of Scottish small firm websites was similar, but they compared poorly in regards to navigability and content. With regard to navigability, in the main, Scottish small firm websites possessed few of the features that the WAI emphasised as being important on their pages (own search functions, site map and help page). Therefore, they received modest scores for navigability, compared to the 75 points awarded to other WAIs. However, these modest scores are not a major issue for Scottish small business websites. Most Scottish small business websites utilise few pages so the requirement to incorporate features that aid navigability does not appear to be an issue. Certainly a virtue of most Scottish small business websites was their uncomplicated pages. Therefore, Gonzalez and Martinez’s WAI and how it assesses navigability does not accurately reflect the characteristics of Scottish small business websites.

### Table 4: Website quality comparisons

<table>
<thead>
<tr>
<th></th>
<th>Weighting</th>
<th>Scottish small firms</th>
<th>Top 200 Spanish firms (from Gonzalez and Palacios, 2004)</th>
<th>Spanish retail trade industry (from Gonzalez and Palacios, 2004)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>20</td>
<td>23.00</td>
<td>24.40</td>
<td>21.18</td>
</tr>
<tr>
<td>Speed</td>
<td>10</td>
<td>71.40</td>
<td>74.47</td>
<td>87.90</td>
</tr>
<tr>
<td>Navigability</td>
<td>20</td>
<td>50.96</td>
<td>75.81</td>
<td>75.00</td>
</tr>
<tr>
<td>Content</td>
<td>50</td>
<td>38.58</td>
<td>64.10</td>
<td>69.50</td>
</tr>
<tr>
<td>Index</td>
<td>100</td>
<td>41.22</td>
<td>56.62</td>
<td>62.98</td>
</tr>
</tbody>
</table>

Finally, like navigability, the website content of Scottish small businesses was heavily penalised for not incorporating features common to the websites of large Spanish companies (some features common to larger companies included personalisation capacity, entertainment elements, online orders, job opportunities, daily news highlights, financial information, job opportunities etc). Once more the requirement for these “features” is less critical for the majority of small business websites as they generally operate much less sophisticated businesses due to the narrower scope of their activities and product ranges. Thus Gonzalez and Martinez’s WAI emphasis on features is not entirely appropriate for the largely featureless content of Scottish small business websites. For the most part given the scope of the activities performed by Scottish small businesses the lack of features was entirely appropriate. Most Scottish small businesses provided the essential information required to transact or communicate with their customers, such as product or service description, background information, online ordering and contact details. Hence, Gonzalez and Martinez’s WAI
and how it calculated website content is not useful in these specific respects to evaluate the characteristics of Scottish small business websites. The higher WAI scores of the large Spanish companies used for comparison were probably due to their businesses being much more reliant on online transactions. Since the offline market provides supplementary support, the quality of the website content was not as essential for Scottish small businesses.

**Relationship between WAI categories**

Spearman’s Rank Order Correlations was used to investigate the relationship between the different WAI categories (accessibility, speed, navigability and site content) for Scottish small businesses. Table 5 shows the significant correlations identified. Site content was significantly related with accessibility and speed. Both correlations suggest that the best designed sites are rich in content, easily accessible and download speeds are fast. The negative relationship between content and speed was anticipated as well. Websites that contain more informational, communicational and transactional elements are usually slower.

**Table 5: Spearman’s Rank Order Correlations Between Factors of Website Quality and Web Assessment Index**

<table>
<thead>
<tr>
<th>Factors</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2) Speed</td>
<td>-.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3) Navigate</td>
<td>.12</td>
<td>-.21</td>
<td></td>
</tr>
<tr>
<td>(4) Content</td>
<td>.41</td>
<td>**</td>
<td>-.35</td>
</tr>
</tbody>
</table>

N=40. Access = Popularity scale; Speed = Page load time measure; Navigate = Ease of use measure.

**p <.001, *p <.005**

Nevertheless, this situation can be avoided by distributing site content across many different pages and keeping the home page as simple as possible (Hernández et al., 2009). Additionally the use of intra-site links can quicken download speeds by spreading content across self-contained pages (Hernández et al., 2009). On the other hand, there were no significant relationships between speed and accessibility, between speed and navigability, and between content and navigability (a < 0.05).

**WAI usefulness**

The WAI favours large companies that operate complex and content rich websites. These websites also necessitate extra navigation features for users to improve their usability. In contrast, small businesses in this study operated a minimal number of essential features. Given the simple nature of the small business websites investigated in this study the requirement for rich content and navigability features was unnecessary. In its current form Gonzalez and Martinez’ WAI reflects the website quality characteristics of large rather than small companies. For the WAI to a credible
tool for assessing the website quality of small businesses the factor weightings for accessibility, navigability, content and speed require modifications.

Discussion
The current paper hypothesises that rural small firms are more disadvantaged than urban small firms. Due to these disadvantages it was expected that rural small firm websites would be less sophisticated than those of urban small firms. However, as Table 6 indicates for Research Question 1 there were no significant differences in the level of website quality between Scottish rural and urban small businesses. Research Question 2 compared the WAI from this study of small businesses websites against other businesses previously investigated by Gonzalez and Martinez (2004). The results for this question illustrated that Gonzalez and Martinez’ WAI did not adequately evaluate the characteristics of Scottish small business websites. The assessment of speed and access were comparable across large and small businesses, but critical issues arise when content and navigability were examined. Hence, the ability of Gonzalez and Martinez’ WAI to allow direct comparisons between different business sizes was mixed.

Research Question 3 investigated how knowledge of each category of website quality: accessibility, speed, navigability and site content, could help improve rural small business websites. Spearman’s Rank Order Correlation suggested that the best designed sites are rich in content, easily accessible and download speeds are fast. Conversely, there were no significant relationships between speed and accessibility, between speed and navigability, and between content and navigability (a < 0.05). The final research question, RQ4, considered usefulness of Gonzalez and Martinez’ WAI for measuring the quality of websites in the small firms sector. Results suggest that the weightings used within the Gonzalez and Martinez’ WAI do not adequately evaluate the characteristics of Scottish small business websites. Instead the WAI favours large, complex firms that make extensive use of content and navigation features. The factor weightings for accessibility, navigability, content and speed require modifications for assessing the website quality of small businesses.

Conclusions
A gap between urban and rural website quality was not revealed from this investigation; website quality was comparable between urban and rural small businesses. It is likely that the most important factors for small businesses obtaining a high quality website are having time, resources and the skills to make it happen.

The ability of the WAI to assess companies of different sizes was limited. It would be asking too much of any measurement instrument to possess universal applicability. To extend the application of the WAI would require adjustment to the measures by which the different factors are scored. What the WAI did effectively was to provide an index for measuring companies that are alike in their characteristics such as size and/or industry. On the basis of comparing like companies with each other then the WAI can be considered a valuable tool. Analysing related companies using the WAI would encourage business owners/managers to question the quality of their websites against rivals. This process of questioning would be invaluable for gaining insights about designing user friendly websites.
Table 6 Summary of research questions and findings

<table>
<thead>
<tr>
<th>RQ#</th>
<th>Research question</th>
<th>Outcome?</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1</td>
<td>Do Scottish urban and rural small business websites differ in terms of their levels of quality as measured by Gonzalez and Palacios’ WAI?</td>
<td>No</td>
</tr>
<tr>
<td>RQ2</td>
<td>How does the website quality of Scottish small businesses compare against other businesses previously investigated by Gonzalez and Martinez’ WAI?</td>
<td>Mixed</td>
</tr>
<tr>
<td>RQ3</td>
<td>To what extent do the relationships between the different categories of website quality: accessibility, speed, navigability and site content, afford effectiveness to small Scottish firms?</td>
<td>The best sites are rich in content, easily accessible and download rapidly</td>
</tr>
<tr>
<td>RQ4</td>
<td>How useful is Gonzalez and Martinez’ WAI in terms of measuring the quality of websites in the small firms sector?</td>
<td>Modifications required</td>
</tr>
</tbody>
</table>

The results of this study suggest several possible areas of future research. First, this study examined urban and rural Small businesses in Scotland. It would be important to expand the study to other countries to see if the results obtained are generalisable. Second, a qualitative study examining in detail the characteristics of rural SME users and how they employ e-commerce would provide valuable new insights into how the WAI can be improved for assessing small business. Third, this was a cross-section study as the data was collected from a single visit to each site at one point in time. The internet, website design and web technology are all dynamic and changeable forces, so similar studies are required at different times. A longitudinal study is likely to show different results. Another possible avenue for future research would be to examine rural small businesses operating in particular industry sectors.

It would also be valuable to investigate whether there are any differences between rural small businesses that operate transactional only websites compared to those that manage informational only websites. Transactional only websites are likely to maintain higher quality websites due to the need to stay competitive with rivals. A final possibility is to investigate the relationship between internet portal membership and website quality. It would be interesting to determine whether portal membership enhances accessibility of rural small business websites compared to those firms that do not belong to a portal.
References


Appendix 1: Web Assessment Index

<table>
<thead>
<tr>
<th>WEB ASSESSMENT INDEX</th>
<th>Metrics</th>
</tr>
</thead>
</table>
| **Clarity of purpose** | a) Clear from start what is on offer information only or transaction capability On home page = 1, No = 0  
b) information clearly organized on home page Yes=1, No=0  
c) Clear links and instructions in menu home page for self service sites Yes=1, No=0 |
| **ACCESSIBILITY** | a) Presence in search engines Use generic keywords of the company’s products/services via Google, Yahoo and Bing to check search engine presence. Appears in first three pages or less =1, more than three pages = 0  
b) Popularity Use the PageRank Service ([http://www.prchecker.info/check_page_rank.php](http://www.prchecker.info/check_page_rank.php)) to check the link popularity of each site.  
b) Popularity Use the following service ([http://www.linkpopularity.com/](http://www.linkpopularity.com/)) via Google and Bing search engine to check the popularity of each site. |
| **NAVIGABILITY** | a) Sitemap Easily accessible on every page = 2, have to search = 1, none = 0  
b) Whole site Yes=1, No=0  
c) Within specific category Yes=1, No=0  
d) Use of drop down lists Yes=1, No=0  
e) Results on one page, few and relevant Yes=1, No=0  
f) Criteria recognized whether single or plural Yes=1, No=0  
g) Keyword search function Yes=1, No=0  
h) Links to internal pages correctly described Yes=1, No=0  
i) Minimum number of links to information on products/services Arrive in three pages or less =1, more than three pages = 0  
j) Change colour once used Yes=1, No=0  
k) Allows undoing, redoing using links or back button in menu Yes=1, No=0  
l) Navigation bars better at top and side Navigation bars at top/side = 2; Navigation bars at side or top = 1; No navigation bars = 0  
m) Home button every page Yes=1, No=0  
n) Does not open up new screens Yes=1, No=0 |
| **SPEED** | a) Loading speed Use the following web service |
CONTENTS QUALITY

**Informational content**

- a) Company background  Yes=1, No=0
- b) Product/service description  Yes=1, No=0
- c) Daily news highlights  Yes=1, No=0
- d) Financial information  Yes=1, No=0
- e) Job opportunities  Yes=1, No=0
- f) Check order/shipment status  Yes=1, No=0
- g) Search for dealers, agents, stores, etc.  Yes=1, No=0
- h) External links  Yes=1, No=0
- i) Link to firm divisions  Yes=1, No=0

**Transactional content**

- a) Online orders  Yes=1, No=0
- b) Fill-in forms simple and self explanatory  Yes=1, No=0
- c) Appropriate for different nationalities e.g. address layout  Yes=1, No=0

**Clicks**

- a) Shopping basket button  Yes=1, No=0
- b) Check out button  Yes=1, No=0
- c) No. of clicks to order  Three clicks or less = 1, more than three clicks = 0

**Communicational content**

- a) Contact e-mail  Yes=1, No=0
- b) Contact telephone or address  Yes=1, No=0
- c) Receive news by e-mail  Yes=1, No=0
- d) Free e-mail service  Yes=1, No=0
- e) Personalization capacity  Yes=1, No=0
- f) Entertainment elements  Yes=1, No=0

**Text**

- a) Too much/endless scrolling pages  Yes=1, No=0

**Colour**

- a) Matches brand or corporate image  Yes=1, No=0

**Graphics**

- a) Relevant, sharp and not too large (can affect download of page)  Images small/used as links = 2, images small = 1, images slow to download = 0

**Animation**

- a) Does not distract from content  Yes=1, No=0
- b) Does not need extra software to download or increased modem speed  Yes = 1, No/unnecessary = 0

**Consistency**

- a) Page layout similar on each page  Yes=1, No=0
- b) Same procedures for similar/related things  Yes=1, No=0