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What Lessons Can We Learn for “Good e-Government” From a User-Centred Evaluation of the Websites of European Capitals? Research-Based and Genetic Learning in the Study of Administration and Law

Margit Christa Scholl, Technical University of Applied Sciences Wildau, Wildau, Germany

ABSTRACT

From an E-Government perspective, modern public administrations require a high degree of accessibility, simplified modes of communication, transparent processes, and services that are available electronically. This article addresses the issue of whether, in a Europe-wide comparison, the websites in question offer products and services in a way that is not only intelligible and transparent for users but also efficient and functional. The websites were analysed using the evaluation tool TEDS*MOODLE as part of a student project, whose ratings are presented, to establish research-based and genetic learning as part of the study programme of administration and law. A general finding of the websites of seventeen European capitals applying an E-Government perspective is that the main challenges are in the evaluation categories Adjustment, Further Performance Features – as there are time and cost savings as well as security and safety aspects – and Affection, as indicated by the general satisfaction factor in the user evaluations. The article discusses the transferability of the student results to citizens. Moreover, the article discusses the fitness for purpose of the evaluation tool, and its utility for learning processes, in particular for research-based and genetic learning among students.

KEYWORDS

Citizens E-Participation, E-Government, Evaluation Tool, Research-based Learning, Transparent Processes, User Expectations, User Experiences, Website Analysis

1. INTRODUCTION

Public administrations are trying to modernize their processes via E-Government activities and offering services on their websites. But what are their objectives and how are these being implemented in their web presence? And how clear and functional are the websites of European capitals for users? Success in using online information portals might be largely dependent on the information being presented in an intelligible way, on its accuracy, on the functions the portal offers and its user-friendliness, and on the general build and design of the website. This has been investigated in a Europe-wide comparison using a finely structured evaluation tool as part of a student project adopting an E-Government perspective, whose ratings are presented in this article. However, no scientifically uniform definitions of E-Government have been established to reliably explain what *E-Government* actually is. Moreover,

not only does it overlap with other terms such as Open Government (Nam, 2011; Janssen et al. 2012) and Social Media (Kaplan & Haenlein, 2010) but it has also seen further evolutions in the form of Smart Government and Smart Governance (Scholl & Scholl, 2014).

While Government websites, online information systems, and E-Government platforms are being increasingly implemented and used worldwide, this increase has often not been actively matched by user acceptance. The development is often generally done “for” and not “with” the citizen. Bertot et al. (2008) point out, the dilemma inherent in providing cost-saving, citizen-oriented, and efficient services is that the government has known little about *what* citizens want from E-Government. What do users feel about the quality of these websites as information artefacts? How can they be involved in a co-design process? The article’s first objective is to show the current state of play in Europe and to demonstrate how the user experience can be utilized to achieve concrete improvements in the design, functionality, and services of such information artefacts – namely, the websites of European capitals – using the research-based evaluation tool TEDS*MOODLE, as well as to examine the possible limitations of this tool. The second objective is to raise student awareness regarding the implementation of E-Government services using a scientific evaluation method. From this perspective, one has to have in mind that technical systems, platforms, and websites are also turned into sensitive instruments of intentional social intervention (Lessig, 1999). Last but not least, one further objective of the article is to gauge whether such student projects can be used to establish research-based and/or genetic learning in study programmes at universities of applied sciences.

Bertot et al. (2008) attach particular importance to the qualitative evolution of E-Government services, whereby the user experience (UX) should be *explicitly* taken into consideration in the development of IS (Garrett, 2011; Scholl, 2015). According to Tullis & Albert (2013), the UX is not something nebulous but by and large includes three elements: an involved user, an HCI between the user and an information artefact (IA), and the user’s concrete experience of the IA. Added to this is the fact that citizen-oriented E-Government needs to serve very different user groups – including, for example, foreign nationals who want to get specific information about the country (Bertot et al., 2008) or have come there as tourists. Consequently, various challenges have to be met to produce a website that offers a positive UX.

On account of this heterogeneous terminology in E-Government, the students as evaluators have gone back to the Speyer definition of E-Government for the interpretation and possible transferability of these case study results. The Speyer definition specifies that the classical realms of application in E-Government can be assigned to the three different levels of interaction: *Information*, *Communication*, and *Transaction*. In its most basic form, E-Government comprises electronic information services (*E-Information*) such as information systems (IS) for citizens, tourists, and businesses as well as IS for committees and specialized uses. Extending these or other similar information services to include options for information exchange, dialogue, or even participation (*E-Participation*) creates the additional functionality needed to provide electronic communication (*E-Communication*). The third level of interaction between citizens or businesses and administrations and government is represented not only by form-filling solutions (*E-Forms*) and online transaction services (*E-Transactions*) but also by the provision of goods and products with electronic payment systems (*E-Commerce*) and general services (*E-Services*). In this respect, current international research results indicate definite similarities as well as differences between, for example, private-sector E-Commerce and E-Government: “Transaction processing was found more sophisticated and of far higher volume in commerce than in government” (Barzilai-Nahon & Scholl, 2010).

Independently of such differences, all the areas of application of E-Government require coordinated business operations (*E-Workflow*) capable of handling so-called front- and back-end processes (see also Homburg & Bekkers, 2002; Weerakkody et al., 2006) if the services are really to work. And across

all three levels of interaction, the way these electronic processes are shaped is a reflection of a (more or less) democratic structure (Büschensfeldt & Scholl, 2014) and a shared understanding of values (*E-Democracy*). Technical systems are turning into instruments of social intervention (Büschensfeldt & Scholl, 2014) and both technical and organizational structures facilitate or limit human-computer interaction (HCI) (Giddens 1984). The new possibility that IS offer of designing process-oriented interaction and the real added value for citizens, businesses, and administration (*E-Benefit*) determine the success of E-Government (Lucke & Reiner mann, 2010), which is, however, dynamically dependent on multiple factors within the various (IT) initiatives (Gil-García & Pardo, 2005).

The evaluation methodology applied for the Europe-wide comparison is a subtly nuanced system based on the scientific TEDS framework, which has been used to analyze the “actor- and utilization-specific evaluation of IS/IT artifacts” (Scholl et al., 2011). Amongst other things IA have been also evaluated from marketing and consumer perspectives (Wolfradt & Doll, 2001) and from a communication point of view (Waters et al., 2009). However, in terms of their analytical range and fine structure, these frameworks seem to provide a lesser degree of analytical power. Our investigation is based on the same “human agent-centric” approach within the TEDS framework (but is used for E-Government IA) and is therefore different from prior studies using automation to evaluate government websites. The TEDS*MOODLE evaluation tool was used for the assessment of a total of seventeen European capitals by four independent reviewer groups comprising students from one administration degree programme (VR 12, 5th semester) in the winter semester 2014–15 (WS 14/15). The study using the developed TEDS*MOODLE tool is important to gain a deeper insight into the UX of a targeted audience (*personae*) within a defined action (*scenario*) to increase the understanding of the improvement of specific IA in E-Government relating to users’ needs. The specific contribution of this article’s research questions to the literature on E-Government cover two different areas: the first is the students’ UX and whether this may be generalized to members of the public. The second is the evaluation framework’s fitness for purpose, and its utility for learning, in particular for research-based and genetic learning. The postulate of the unity of research and teaching at universities should allow students to participate actively in science. In 1969m the Bundesassistentenkonferenz defined three distinct types of university learning (Bundesassistentenkonferenz, 2009, pp. 13–15): *research-based learning* as an active part in the current research of the discipline, with its own realization of potential research projects and with all the disappointments and risks that are inherent to research; *genetic learning* as an enactment of important cognitive processes triggered by the initial questions relating to the difficult stages leading up to the result; the main difference between these two learning types is that the choice of problem, hypotheses, and methods is controlled by the teacher to a certain degree with regard to didactic principles; and *critical learning* as a process of studying within the framework established by the specific settings and scientific attitudes of researchers.

The theoretical background to tool TEDS*MOODLE and its current criteria are briefly given in section 2, which also explains the student project and the evaluation scenario as well as the research questions (RQ). Section 3 offers a summary of the results of the student sub-projects for all seventeen websites. A general discussion and responses to the RQ can be found in section 4. Section 5 summarizes the general learning results in comparison with further literature, the limitations of this case study, and ongoing lines of research.

2. METHODOLOGY

2.1. TEDS*MOODLE Evaluation Tool

The results shown here are based on the use of the TEDS*MOODLE evaluation tool (Scholl et al., 2014), which was developed in the externally funded research project TEDS@wildau as a computer-based tool to implement the methodology and criteria of the TEDS framework (Scholl et al. 2011), which itself builds on the concept of Taylor’s “value-added processes” (Taylor, 1982). Robert S. Taylor had evolved six criteria for evaluating human needs when dealing with IT and the developed TEDS

framework by H. J. Scholl et al. presents a finely structured, analytical instrument for evaluating any kind of information artefact with specific emphasis on actors and usage within a specifically defined scenario. The TEDS framework has so far been used as a research methodology in the evaluation of sports websites for football clubs operating internationally (cf. Jurisch et al., 2014). Since the winter semester 2013 the TEDS*MOODLE tool developed at the TH Wildau has been available in the Moodle learning platform as an activity with didactic support (Scholl, 2014) and has been used with different questions in various student projects (Scholl, 2015).

The results shown here relate first of all to a new Europe-wide TEDS evaluation of the websites of European capital cities with populations exceeding one million. In each case, the URL was specified for the city in question and seventeen TEDS activities were set up in the Moodle platform for each of the student reviewer groups so that the anonymized results would be group-specific. In line with the methodology of the TEDS framework (Scholl et al., 2011), the website of the City of Berlin was chosen as a reference and “anchor”, and the students got a chance to familiarize themselves with the methodology in the process of evaluating it. The rating of the evaluation criteria is based on the five-point Likert scale, which ranges from “strongly agree” (1) and “agree” (2) to “disagree” (4) and “strongly disagree” (5); category 3 stands for “neutral” and fuels debate among users on a regular basis. As an outcome of the evaluation, the tool has provided some preliminary statistical output as well as frequency distributions for each criterion presented in graphical form. Results that reveal a mean rating of less than 2.5 indicate an on-average positive agreement with and satisfaction of the criteria in question. A mean rating of more than 3.5 suggests poor fulfilment of the criteria. The raw data is made freely available to all reviewers within the Moodle learning platform and can be downloaded for individual evaluations and processed further.

2.2. Evaluation Categories and Criteria

In the current version of the evaluation tool, there are thirty-three evaluation criteria organized into the following six main categories (see Figure 1): *Ease of Use* (criteria 1–5), *Noise Reduction* (6–12), *Quality* (13–17), *Adjustment* (18–26), *Performance* (27–28), and *Affection* (29–33). The TEDS*MOODLE application leads reviewers through the thirty-three evaluation criteria within the Moodle course room, while they conduct a parallel evaluation of the IA under consideration using the Likert scale. Besides reducing the number of criteria (originally forty in the TEDS framework) to thirty-three in TEDS@MOODLE, the electronic version is also a very finely structured tool. To reduce misunderstandings about the interpretation of the individual criteria, while the reviewers are running through the evaluation, they not only see the main category with the respective criterion but are also shown a question as a didactic support tool and an image as a helpful prompt. The tool is available in three languages: German, English, and Spanish (Scholl et al., 2014).

2.3. Student Project and Evaluation Scenario

The Administration and Law programme (VR) imparts a broad-based understanding of the field of public law and financial management in the public sector. A further component of the course is public-sector administration. Students attain knowledge of the area of E-Government as well as social competences for their subsequent dealings with citizens. The course prepares students in Germany to embark on a career in non-technical areas of the civil service and is offered in German. The following foreign languages are on offer at the university: English (both general and subject-specific), French, Spanish, Russian, Polish, Italian, and German as a foreign language. However, for the VR programme only English is compulsory.

The evaluation of the European websites was completed as a student project assignment within the fifth semester of the Administration and Law programme (VR12) and included independent project, risk, and quality management. The evaluation scenario was to consider these websites from an E-Government perspective and to rate them accordingly from the point of view of a European citizen. The methodology of the TEDS framework (Scholl et al., 2011), further literature, and the

Figure 1. Table of the six main categories, thirty-three sub-criteria, and guide questions used in the evaluation tool TEDS@MOODLE

Criterion #	Category	Criterion	Question for help
1.	Ease of Use	Browsability/Searchability	<i>Could you find what you were looking for?</i>
2.	Ease of Use	Formatting/Presentation	<i>Was the formatting and presentation of information user friendly and easy to understand?</i>
3.	Ease of Use	Mediation	<i>Can the information be clearly navigated?</i>
4.	Ease of Use	Accessibility	<i>Is access to the desired information or functionality easy?</i>
5.	Ease of Use	Simplicity	<i>Is the information presented in a straightforward manner?</i>
6.	Noise Reduction	Item identification	<i>Is it possible to recognize information unproblematically?</i>
7.	Noise Reduction	Subject classification	<i>Is information easy to find?</i>
8.	Noise Reduction	Subject summary	<i>Is the information clearly and concisely summarized?</i>
9.	Noise Reduction	Linkage/Referral	<i>Are there functioning links to other information sources outside the information artifact?</i>
10.	Noise Reduction	Precision/Relevance	<i>When searching for specific information, are the results sufficiently precise?</i>
11.	Noise Reduction	Selectivity	<i>Is it easy to select specific information?</i>
12.	Noise Reduction	Novelty	<i>Do you trust that the information you select is up to date?</i>
13.	Quality	Accuracy	<i>Do you consider the information to be free of errors?</i>
14.	Quality	Comprehensiveness	<i>In your opinion, is the information complete?</i>
15.	Quality	Currency	<i>Do you rate the information as reliable?</i>
16.	Quality	Authority	<i>Do you find the information trustworthy?</i>
17.	Quality	Feedback	<i>Is it possible to give feedback?</i>
18.	Adjustment	Closeness to problem	<i>Is the information relevant to your current problem?</i>
19.	Adjustment	Flexibility	<i>Are you able to flexibly customize the information?</i>
20.	Adjustment	Simplicity	<i>Is it easy to adjust the way the information is presented in the information artifact?</i>
21.	Adjustment	Transaction	<i>Is there a direct transaction function available when required for purchasing goods and products?</i>
22.	Adjustment	Trust in savings	<i>Can you be sure that your customizations will be saved?</i>
23.	Adjustment	Community	<i>Do you have forums available that you can make free use of?</i>
24.	Adjustment	Individualization	<i>Can you tailor the way information is presented to meet your individual requirements?</i>
25.	Adjustment	Localization	<i>Can you adjust the information display for different time zones, languages, or cultural circumstances?</i>
26.	Adjustment	Privacy	<i>Do you have information to help you find out how to secure and protect your data?</i>
27.	Performance	Cost & time savings	<i>Does the information help you to save time/money?</i>
28.	Performance	Security & safety aspects	<i>Is the information made available in a secure way?</i>
29.	Affection	Aesthetics	<i>Is the design attractive?</i>
30.	Affection	Entertainment	<i>Do the entertainment elements in the information presentation encourage you to stay longer?</i>
31.	Affection	Engagement	<i>Are you persuaded by the way the information is presented? Does it make an attempt to win you over?</i>
32.	Affection	Stimulation	<i>Does the presentation of the information inspire you to undertake your own activities?</i>
33.	Affection	Satisfaction/Rewarding	<i>Do you have a sense of satisfaction after retrieving information?</i>

computer-supported tool (Scholl et al., 2014) were presented as a means to evaluate the websites in the first lecture of WS 14/15. Four teams, each made up of nine students, were formed to provide a framework for the project, the idea being that the individual results from the project groups would also be meaningful. All four groups had exactly the same evaluation task, and each team planned and organized its own assessments. The individual team members were assigned to review the websites separately with no stipulation as to time and place. The subsequent team discussions about convergence and divergence in the evaluation results were to be carried out internally in order to avoid

misunderstandings with regard to the individual criteria, although not with a view to obtaining identical ratings. This means that per team there are nine results for the evaluation of each Internet presence that can be compared with one another. Each team had to substantiate its review and any suggestions for possible improvements. This was then submitted in writing as a project report, producing evaluation data from four commensurable project teams that was in turn subjected to further detailed analysis and summarized for this publication. Since Berlin served as anchor, all the student groups started out with thorough, autonomous discussion of the evaluation result from this website, and each group specified criteria and questions to establish a common understanding so as to clarify any “incorrect interpretations” of the individual criteria within the group before the other websites were studied. The URL of the websites in question were stipulated at the request of the students. This concern on the part of the students was prompted by the general difficulty of finding the website representing the capital in each case. The specification of the URL ensures a uniform data pool.

2.4. Research Questions

The first two research questions, RQ#1 and RQ#2, are framed from the E-Government perspective. The third, RQ#3, relates to the evaluation tool and both sections of the fourth, RQ#4, focus on research-based learning as an educational method.

RQ#1 Do German students with a knowledge of English and a focus on E-Government understand the web presence selected for the various European capital cities conceptually, logically, linguistically, intuitively, and so on? What does a Europe-wide comparison of the websites tell us about the user experience? Is there a common consensus in the results of the student evaluations?

RQ#2 Are the student ratings generally applicable to members of the public? Are the web presences of the selected European capitals constructed in a way that is user-oriented and comprehensible for European citizens, or are they more narrowly directed at their own populations?

RQ#3 Is the scientifically and theoretically based TEDS*MOODLE tool that was used to rate the European websites fit for purpose and suitable for providing citizens online with evaluation criteria and standards that are self-explanatory?

RQ#4 Can the evaluation scenario guide students to scientific methodology and practical empirical findings? And can an assignment of this kind initiate independent research-based learning among the students?

These RQ are answered in section 4 based on the selection of individual results presented in section 3.

3. TOOL USAGE AND STUDENT RESULTS

3.1. Berlin Website as Anchor

In evaluating the Berlin website as an anchor, it is evident that there is a very low variance in the results in the individual groups. On the one hand, this suggests that the groups discussed the criteria with each other in advance and shows, on the other, that this website is patently “easier” to evaluate because of the relationship the users have to the city. The reviewer groups are at pains to produce substantive findings, e.g. by checking matters specific to E-Government, such as housing benefit and the degree to which the entries are up to date. The overall average value for all four groups and all criteria is 2.21 (not shown, see Scholl, 2016). If one looks at the mean values from all four groups divided up according to the main categories (Figure 2, right), one sees very good reviews for the most part, apart from in the category *Adjustment*, which scores an average rating of neutral. This clearly indicates that the Berlin website can be improved in this area. If one goes into the details of the individual criteria by using the modal value of each criterion, one can identify shortcomings

broken down into more subtle nuances (Figure 2, left). The major “oversight” here is in *Adjustment: Community*, which indicates either that there are no forums or social networks on the site or that the reviewers were unable to locate these functions. Students understand the guide questions as a support for their own interpretation of the criteria and not as a restrictive setting. In other words, the focus of the guide question on forums (Figure 1) is not an invitation to ignore other forms of social media or mechanisms designed to engage website users, but is rather to be interpreted by each individual reviewer.

Reviewer “expectations” also play an important role. For example, in this case, a major variance was caused by the fact that some reviewers *expected* there to be links to social networks like Twitter, Facebook, or YouTube. Because Berlin’s E-Government portal does not have this on the home page, this subcategory scored badly as a result.

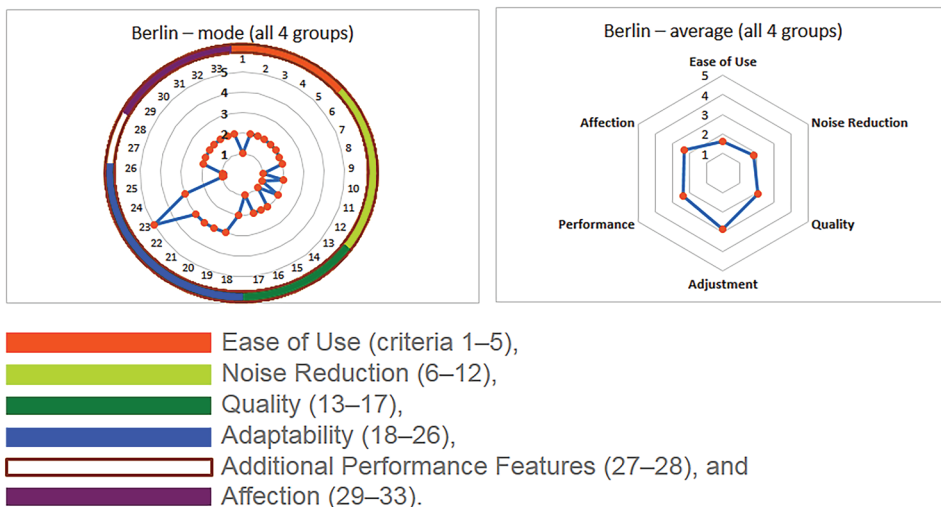
Overall, the individual results for Berlin show that the reviewers often regretted the absence of a general ability to make adjustments for all information, e.g. the option of changing the font size or a read-aloud function for people with disabilities. Apart from the inability to customize search results and make adjustments to the information, there was criticism of the relative difficulty of finding the feedback option, and the suggestion was made to position the feedback button directly on the home page.

Discrepancies with a noticeably high variance occurred in criterion #21, *Adjustment: Transaction*, with the question, “Was there a direct transaction function, where applicable, with a shopping cart?” (see Figure 1). This is because some reviewers criticized the lack of a shopping cart, while others gave a positive rating to the option of buying theatre tickets via a pop-up window from the Eventim company. Differing expectations also led to discussions of criterion #26, *Adjustment: Privacy*, although for the majority of reviewers’ privacy requirements are satisfied by a data protection declaration and https encryption for key pages. However, all in all, the results for the website of Berlin are pretty good.

3.2. Comparison of the Web Presences of Seventeen European Capitals

The results produced by the four independent student project teams with a total of thirty-six reviewers should give us a clearer idea of the services on offer and provide examples of possible areas of improvement. Based on the average of all the evaluations and all thirty-three criteria, Vienna’s website tops the list, followed by London, Berlin, Brussels, and Warsaw (not shown). The last five spots are

Figure 2. Mode (left) and average values (right) in ratings of individual criteria by all four groups reviewing the anchor (Berlin website)



occupied by Rome, Madrid, Budapest, and Sofia, with Bucharest bringing up the rear. Looking at the results from the individual project groups produces a differentiated rating. Vienna is the undisputed “winner” in three of the groups. If one looks at the first five ranking places, there are clear overlaps, and it is by no means only western European capitals that appear in this group: besides Warsaw, the Belgrade and Prague websites also enjoyed positive reviews. By the same token, it is striking that by independent agreement it was not only eastern European capitals that were seen as the poor performers. Instead, what stands out is the neutral result for Rome and Madrid. The essential features of the reviews by the project groups (PG#1 to PG#4) of the individual city websites are rounded up in the following paragraphs.

Vienna (1st place on average across all groups): <http://www.wien.gv.at>

For the website of the Austrian capital the overall average is 1.87. The scores for the individual criteria are frequently 1 or 2 and the worst rating is 3, i.e. neutral (see Figure 3). This illustrates the good impression it makes on all reviewers. There are no language barriers as the site is available in German, English, Turkish, and Bosnian/Croatian/Serbian. It is very well organized and clear, all the information can be located, and forms and applications can be filled out and appointments made online, which represents a substantial saving of time and money. The Turkish pages were also found to be of the same high quality in terms of volume of content and accuracy as the German and English pages. Questions are answered via a virtual office. There are contact addresses, hotlines, a search function, and a feedback option. Publications can be ordered using a shopping cart. There is extensive data protection and https encryption. The font size on the pages can be adjusted.

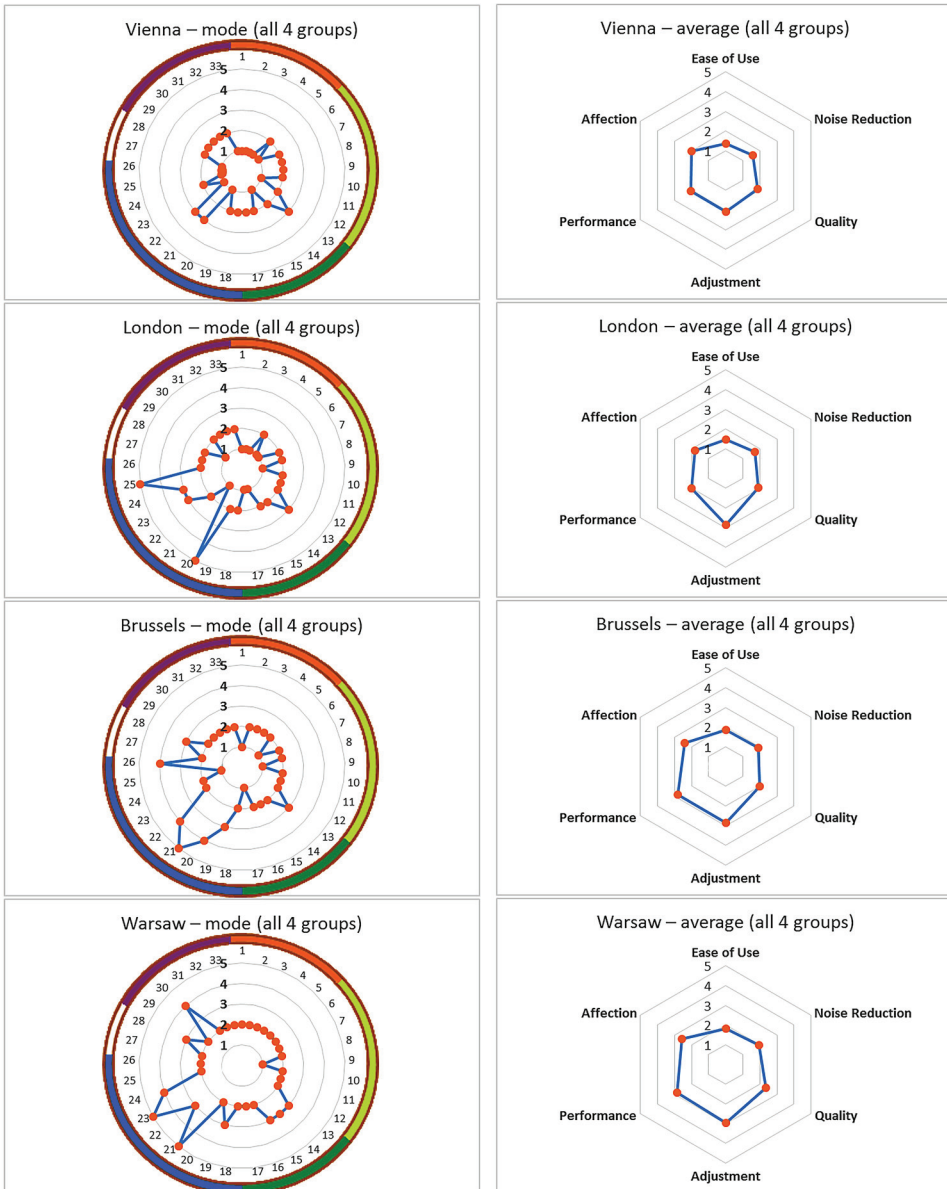
London (2nd place on average across all groups): <http://www.cityoflondon.gov.uk/Pages/default.aspx>

The website of the British capital is in the top five in the individual rankings of all four groups and in three of the groups its overall average of 2.10 scores better than Berlin. The rogue results are in criteria 20, *Adjustment: Simplicity*, and 25, *Adjustment: Localization* (Figure 3). The former seems to indicate certain difficulties with making adjustments, while the latter is due to the lack of different language settings, as the site is only available in English. Even if in relative terms it is heavily geared towards tourism, and at first sight administrative aspects are of secondary concern, forms and applications can be filled out online, saving time and money. However, there was no option of making online appointments. The only products the clearly visible shopping cart could be used to buy were books and postcards. There was no apparent means of making personal adjustments, with the reviewers unable to locate a read-aloud function, sign language, or an option to change the font size. The positives are a clear structure, an attractive design, a capable search function, and multiple possibilities for giving feedback. Based on the statements about sources and publication dates, the assumption is that the information is complete and correct.

Brussels (4th place on average across all groups): <http://www.brussels.be/artdet.cfm?id=4000>

The Belgian capital (Figure. 3) has a good Internet presence with an overall rating of 2.37. There are particularly positive reviews for its structure and the fact that it is equipped with a very good feedback function. The reviewers were able to search for specific information without any difficulties. The information about sources and publication dates adds to the site’s credibility. There is also the option of personally customizing the site, for example, by adjusting the font size. However, all the group members had difficulty finding this, and this was also the case with the feedback area, which gave rise to varying ratings. Although the home page can be translated into twenty-three different languages, the entire website is only available in three languages. The site lacks information about

Figure 3. Mode (left) and average values (right) in ratings of individual criteria by all four groups reviewing IA (Vienna, London, Brussels, and Warsaw websites)



data security and a data protection declaration and there is no shopping cart or transaction option. The partitioning of the website into sections for citizens and tourists is seen as a positive feature. Most of the student reviewers were impressed by the layout of the website and the structuring of the content with standout special features including the ability to personally adjust the IA using Brussels. me. Open Data is also visible.

Warsaw (5th place on average across all groups): <http://www.um.warszawa.pl>

The web presence of the Polish capital left a positive impression on all reviewer groups (Figure 3), which is reflected in an average score of 2.48. Of particular note is the clear organization of the site and the fact that the links are rated as genuinely helpful. There is detailed information on data protection, although not all the reviewers were able to locate this. The addition of a calendar linking to a day-to-day programme of events gives an up-to-date feel to the website. The site can be called up in Polish, English, and Russian. The search function provides good results, although these are not always compatible in terms of language. Additional languages like German, French, and Spanish can be chosen in the extended search results. The detailed frequency distribution shows that the main categories *Ease of Use* and *Noise Reduction* are often rated as good to excellent (Figure 3). At the other end of the spectrum there are rogue results in criteria 21, *Adjustment: Transaction*, as there is no shopping cart on offer, and 23, *Adjustment: Community*, as no forums or other forms of social media were found on the site.

Belgrade (6th place on average across all groups): <http://www.beograd.rs/cms/view.php?id=220>

For many reviewers, it was easy to find information on the Belgrade website (Figure 4). One reason for this is its clear organization into main topics with further subsections, so that it was a straightforward matter to navigate to and retrieve information without using the search function. The overall structure was clear with an overall average of 2.50. Searches led to full information, although a number of students thought that the texts were too long and overloaded. One striking fact was that the website's legal notice was dated 2006. However, the direct source references with the publication dates of reports gave a favourable impression of the site's reliability and trustworthiness. There was the option to give feedback, which could also be submitted in different languages. Not all the expected adjustments were possible and the reviewers could not find any data protection declaration or https encryption. Nevertheless, the groups felt perfectly satisfied with the site. This is probably due to the fact that German is one of the four language options on offer, which made it easy for the reviewers to retrieve information.

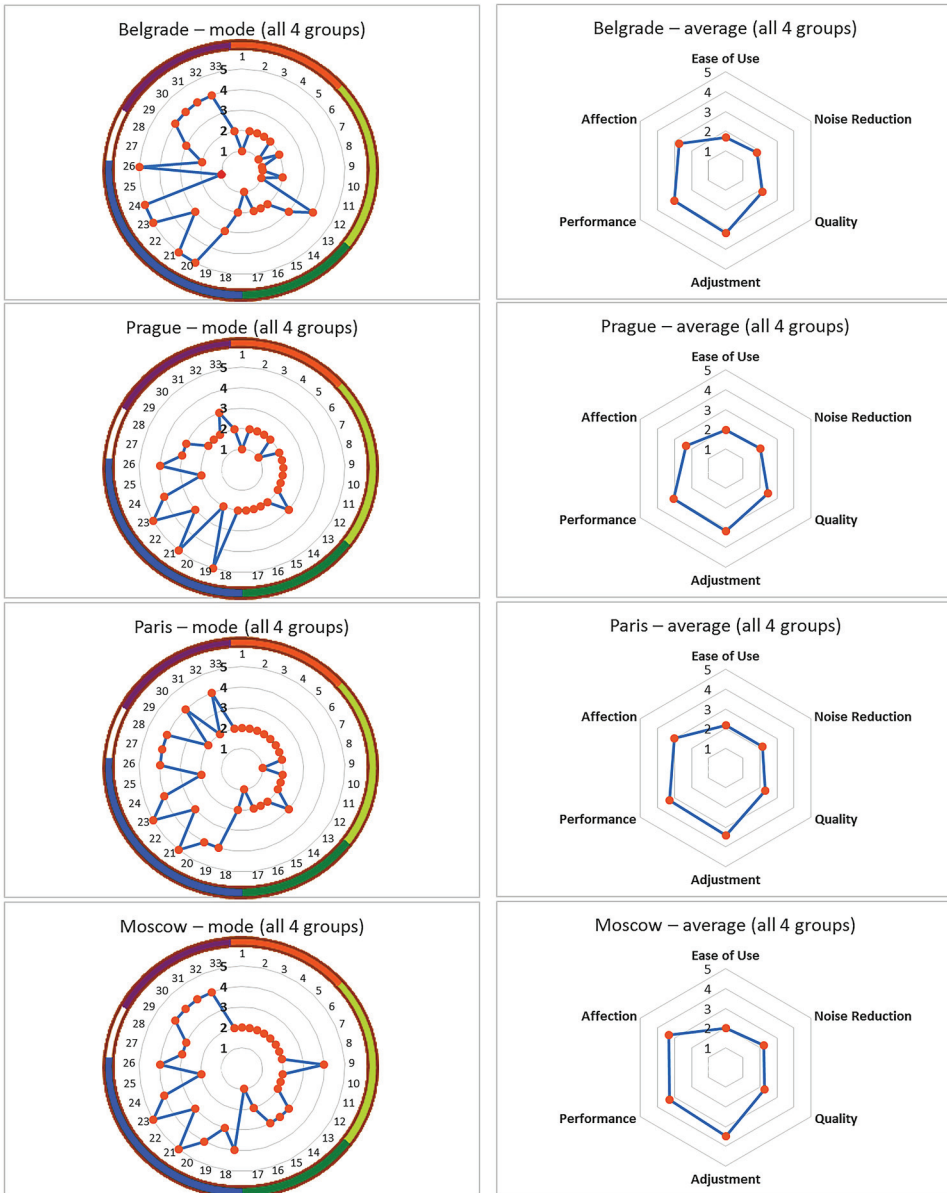
Prague (7th place on average across all groups): <http://www.praha.eu/jnp/en/index.html>

The clear presentation of the Czech capital's website made a convincing impression, even if it only scored an average of 2.57. PG#3 gave the best rating here based on the way the information was displayed and formatted. Information for both tourists and citizens, together with contact data, is shown directly on the home page. There is a clear organizational structure evident on the administrative page and the daily news feature gives the site an up-to-date feel. There are functional links and access to social networks. The site is available in Czech and English, although some of the articles that showed up in the English-language version were in Czech. Criticism was made of the fact that the requests in the search field did not deliver satisfactory results. The rogue results that got the poorest rating from all four groups (Figure 4) are in the *Adjustment* criteria 19 (*Flexibility*), 21 (*Transaction*), and 23 (*Community*).

Paris (8th place on average across all groups): <http://www.paris.fr>

The presentation of the French capital's website (Figure 4) is heavily oriented towards tourists, prompting visitors to stay longer on the site. There is a choice of three different languages: French, English, and Spanish. However, further investigation revealed that the translations do not completely match the original and problems then crop up in obtaining information. The rating from PG#1 shows a rather large variance, with discussion indicating that the citizen service in French was viewed as excellent but could not be understood by all the reviewers as the information in English was

Figure 4. Mode (left) and average values (right) in ratings of individual criteria by all four groups reviewing IA (Belgrade, Prague, Paris, and Moscow websites)



significantly reduced. Criticism was also made of the fact that there is no strict breakdown into topic areas as such, there are no topical items on offer, and the long texts that appear as search results impair the clarity of the site. Overall, reviewers were somewhat less taken with the site, which received an average score of 2.82, slightly better than neutral.

Moscow (9th place on average across all groups): <http://www.mos.ru>

The website for the Russian capital made a good overall impression on many reviewers, who liked its clarity, even if the average score awarded by all four groups is only 2.84. It is organized in a structured way, which makes it easy to search for specific information. However, some problems showed up in the search process. Forms could be filled out online, which saves time, and feedback could be given. Daily news conveyed an up-to-date feel. The pages were available in Russian and English. The function enabling one to select an area of the city and obtain direct information about it is rated as a positive feature. Many individual criteria have a similar frequency rating as for Warsaw (see figs. 3 and 4). There are striking differences in the more negative scores in criteria 9 (*Noise Reduction: Linkage/Referral* – functioning links), 26 (*Adjustment: Privacy* – data security), 29 (*Affection: Aesthetics*), 31 (*Affection: Engagement*), and 32 (*Affection: Stimulation*), which put the Moscow site in ninth place overall. The feedback function (criterion 17) was favourably reviewed by all groups.

Athens (10th place on average across all groups): <http://www.cityofathens.gr>

The website examined for the Greek capital scored a neutral average 3.02 on the Likert scale for all groups. Even if the overall impression for some reviewers was initially promising, the predominant finding was that the site was still in need of improvement. There were very mixed experiences with information searches. The option of many different links to other websites was rated as good, although their functionality was rarely verified. The site is available in Greek or English. The feedback option was difficult to find because it is located on a subpage. No great trust was placed in the reliability of the website (Figure 5): it was not up to date (the last update was more than a month previously) and there was an overall lack of government information.

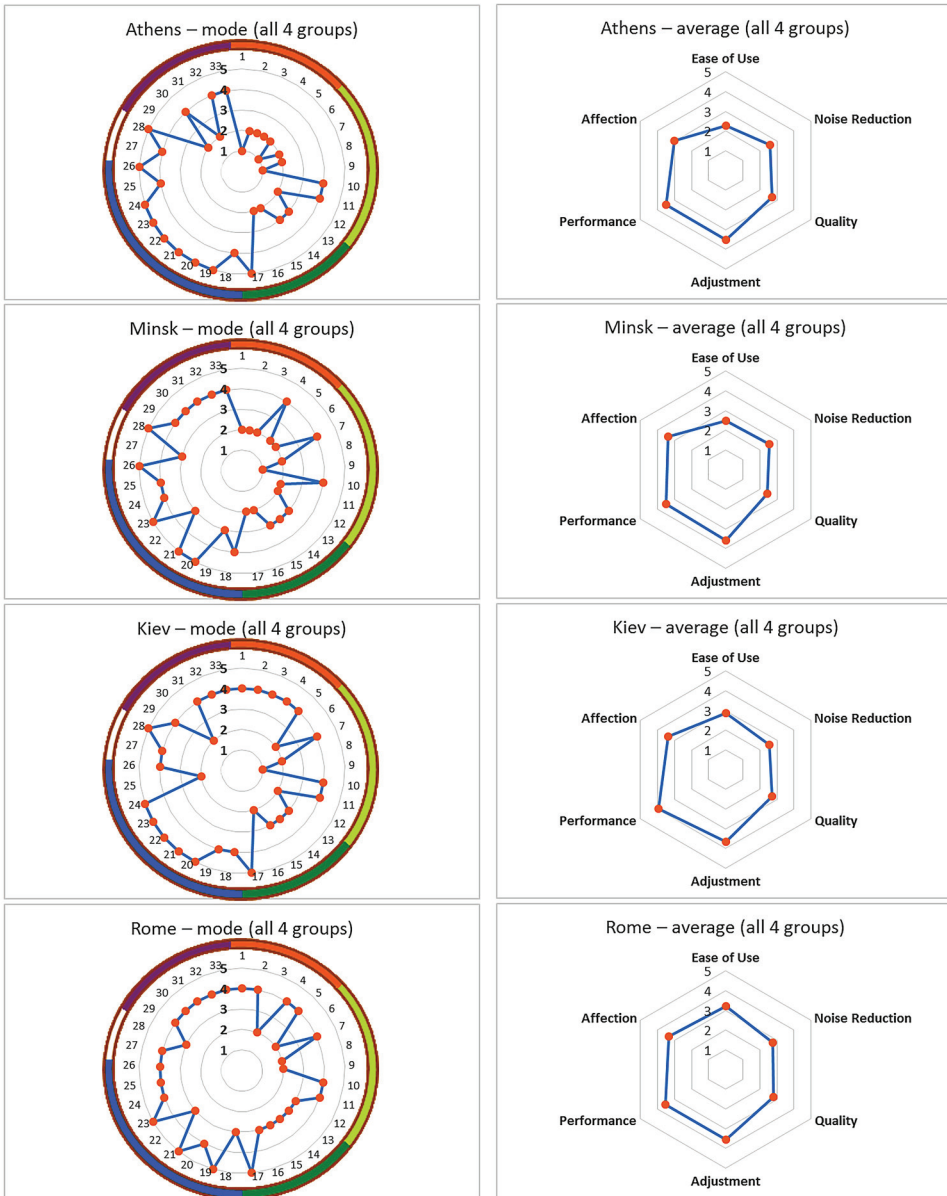
Minsk (11th place on average across all groups): <http://minsk.gov.by>

The Belarusian capital's website, which is primarily a government site, comes in eleventh on average and has a neutral average score of 3.16 with only minor differences between the four reviewer groups. The existing administrative sites are divided up into districts, which have their own additional Internet presences outside the IA in question. Reviewers found the evaluation difficult, as they had no connection to the city of Minsk. The site is available in Russian and English and was in general perceived to be clear and well structured. Advertising is placed discreetly on the side of the page. It was not possible to fully confirm the accuracy of the information and the extent to which it is up to date, and in many places there was no option to make adjustments. The most common agreement between the groups (with a very poor frequency rating of 5; see Figure 5) is found in the criteria 20 (*Adjustment: Simplicity*), 21 (*Adjustment: Transaction*), 23 (*Adjustment: Community*), 26 (*Adjustment: Privacy*), and 28 (*Performance: Security and Safety*).

Kiev (12th place on average across all groups): http://www.kmu.gov.ua/control/en/publish/article?art_id=335366

The website of the Ukrainian capital is also primarily a government and administration site. Although in the view of some reviewers the site fails to give information about the city's affairs, the information was considered to be up to date and this was positively highlighted by all the groups with an overall neutral average of 3.19. Another positive feature was the absence of advertising, pop-ups, or other nuisances. Overall, however, the majority of reviewers was dissatisfied, as navigating the information was not straightforward and its formatting was unclear and not very user-friendly. The site also came in for criticism due to its lack of a feedback form or a data protection declaration and some non-functional links (see figure 5).

Figure 5. Mode (left) and average values (right) in ratings of individual criteria by all four groups reviewing IA (Athens, Minsk, Kiev, and Rome websites)



Rome (13th place on average across all groups): <http://www.comune.roma.it/PCR/do/jpsite/Site/home>

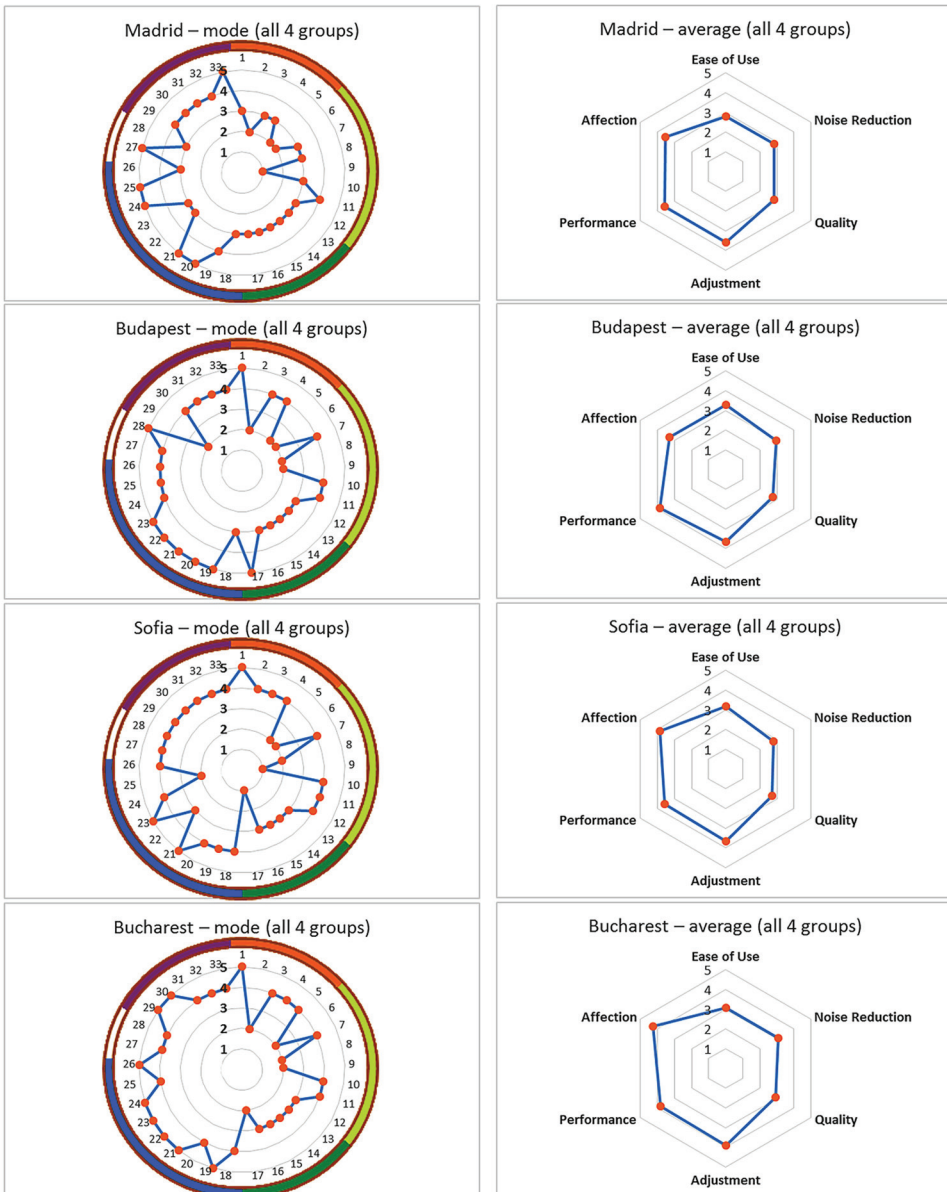
The website for the Italian capital seems modern and clear, is free of advertising, and has functional links. It offers Italian and English as language options. Strictly speaking, only the home page has an English version, as going further into the site or performing more in-depth research requires a knowledge of Italian. This language barrier had a negative impact on search queries and results. The site also contained some obsolete articles that made the site out of date and this was negatively rated. Finally, the design and the font chosen for the site were found to be somewhat unattractive. The

most common ratings are often a 4 or worse, with only occasional instances of a 2 (see Figure 5). The overall average of this website is 3.27, indicating that it tended to create a negative impression.

Madrid (14th place on average across all groups): <http://www.madrid.es>

The Spanish capital’s website left a number of reviewers with a below-average impression (the overall average is 3.28), although the layout is certainly seen as clear and user-friendly (Figure 6). This is primarily due to the fact that the site was only available in Spanish and most of the reviewers

Figure 6. Mode (left) and average values (right) in ratings of individual criteria by all four groups reviewing IA (Madrid, Budapest, Sofia, and Bucharest websites)



lacked sufficient knowledge of the language. As there was no translation into English on offer, the reviewers had considerable difficulty in conducting a straightforward search to retrieve information. The need to use translation tools led to a significant increase in the time spent on the evaluation, which meant that criterion 27 (*Time and Cost Savings*) frequently received the lowest rating, as shown in Figure 6. Moreover, the mode for criterion 33 (*Satisfaction overall*) also has the worst possible value.

Budapest (15th place on average across all groups): <http://budapest.hu/sites/english/Lapok/default.aspx>

The web presence of the Hungarian capital achieved an overall average of 3.37 and did not make a favourable impression on any of the four groups. All the groups put it in the bottom five. Although tourism is the main focus here and administrative information is difficult to find, the general view is that it is extremely complicated to obtain official information directly, both for “newcomers” and for visitors to the city. The main point of criticism, which involves many individual aspects, is that even in the English-language view offered as an alternative to the national language, most of the information was still presented in Hungarian. The major variances in the individual results are due to the fact that some of the reviewers used translation tools to enable them to carry out a proper evaluation, while others did not. The language barrier led to negative scores for the *Adjustment* criteria (see Figure 6). There are no apparent forums or feedback options, links were found to be defective, and the search function produced no result (*Ease of Use: Browsability*).

Sofia (16th place on average across all groups): <http://www.sofia.bg>

The project groups characterized the information on the Bulgarian site as “scanty” and lacking in specificity (Figure 6). In most evaluations positive results in the different criteria are very sporadic (not shown). The positive features are the site’s clear organization, information about data protection, functioning links, an absence of advertising, and the option of giving feedback. The site is available in Bulgarian and English, although many of the menu sub-points are not translated and some of the English translations offered were incomprehensible. There was also no further subdivision of information here. The lack of a search function and the incompleteness and dubious credibility of the information were seen as negatives. This website receives an average score of 3.38, which is worse than “neutral”.

Bucharest (17th place on average across all groups): http://www1.pmb.ro/pmb/index_en.htm

The overall view of the Romanian capital’s Internet presence is that it has major shortcomings (Figure 6), which put it in last place based on an average of 3.41 for all the evaluation categories. However, in this case clear differences between the group results can be seen, ranging from nearly 4 to 2.8 on average. It is noteworthy that PG#3 is an exception here, as in their rankings this website does not appear in the bottom five. Positive features are the simplicity with which the information is presented and the ease with which it can be found. With the other three project groups, in many cases the reviewer did not pick up on the feedback function, the search function and the many links available were classed as non-functional, and the design was considered to be “unsympathetic” or “outmoded”.

4. GENERAL DISCUSSION AND RESPONSES TO THE RESEARCH QUESTIONS

The evaluation tool available with TEDS*MOODLE delivers very detailed results. Obtaining clarity about the meaning of the individual criteria based on the review of the anchor, Berlin, thus plays an important role when it comes to analysing the group evaluation and in the risk and quality management of the student projects. When seen in the light of a current, Germany-wide study, the choice of Berlin

as the anchor in the results presented here is borne out inasmuch as the city is to some extent ahead of the field (Nationaler Normenkontrollrat, 2015a). In terms of having the capacity to make appointments online, Berlin is well in front, followed by Hamburg (p. 34). The two cities are also frontrunners when it comes to the option of making online status queries (p. 36). The city states of Berlin, Bremen, and Hamburg, which each offer twenty online services, are well ahead in comparison to the other federal states (p. 37), while Hamburg is the leader in providing a seamless application process, followed by Berlin (p. 38). There is only one area in which Berlin and Hamburg are significantly outshone by North Rhine-Westphalia: in providing contact information for specialized advisers.

The intense discussion in each of the four student groups may also point to the fact registered by Volkoff and Strong that “the affordances that exist for the team as a whole may be different from the affordances that exist for individual members of the team” (Volkoff & Strong, 2013). Since the focus was meant to be on E-Government, it comes as no surprise that websites in which E-Government functionality and services are clearly incorporated are on average rated as better than “neutral” (“3”). Although there are definite differences in the scores and hence in the rankings of individual, comparable groups, everyone puts the websites of Vienna, London, and Berlin in the top four. In this respect, across all groups there is a certain consensus apparent in the independent evaluation results.

The language barrier was a major hurdle that all the reviewers were obliged to overcome, as the information, communication, and transaction aspects of the sites are not at all identical in the different languages on offer. There is not always an English translation, nor is the extent of the information provided in the various languages equivalent or the content intelligible. Moreover, the online translation tools used by the reviewers are time-consuming and do not always render the material intelligible. Almost all the websites still need to do their homework to provide comprehensive information, at the very minimum in English.

One finding is that it is primarily cities that had previously been part of the Soviet Union that bring up the rear in the student rankings. This could indicate that these cities do not have the necessary financial and staff resources to design their websites in a more user-friendly style, in the way that the western cities do. However, it might also point to the specific “western” socialization of the German reviewers or to general cultural and sociopolitical differences within Europe. Even if sociocultural influences cannot by any means be excluded, it would not be fair to make a simple distinction between positively rated western European websites and negatively rated eastern European sites. This would not be an accurate reflection of the results produced by the student groups, particularly as all the project reports endeavoured to deliver sound, scientifically supported analysis. Rather, in the websites that were analysed there was a clear difference in quality in what was offered to citizens and to tourists. The European capitals need to make forward strides in keeping their information and services complete and up to date, in managing their search functions and the way they present information, in providing feedback options and links to social networks, and, in particular, in enabling adjustments to be made in the font size and offering read-aloud and sign language functions to promote full accessibility.

4.1. Findings

Research Question #1: A degree course is an academic training with a scientific background. Universities must ensure that students are properly qualified to become future employees in business, administration, and institutions and these qualifications need to be tailored in line with the current state of scientific knowledge. Based on their degree course and the internships they are required to do in professional practice, the student reviewers have more concrete ideas about E-Government and possible services in Germany, although this is rather less the case when it comes to other countries, even in Europe. This student project was thus a means not only of learning a scientific evaluation method but also of giving an international dimension to their knowledge. In answering RQ#1, it should be noted that it seems a) that the German students, with their knowledge of English and their connection to E-Government, can scientifically analyse the selected websites using the adopted methodology and give sound reasons for their research results, and b) that a certain shared consensus

can be discerned in the independent evaluation results of the four groups. Language barriers cropped up when the websites did not provide sufficient information in English. However, more group-related research has to be done to analyse in more depth whether their application is *scientific* rather than simply methodological.

4.2. Transferability of the results to citizens

If one looks at the Eurobarometer figures for 2012 (Bundeszentrale für politische Bildung, 2012), the number of EU citizens who speak at least one foreign language amounts to 54 per cent, with the most popular foreign language in the EU being English. However, only 44 per cent say that they have mastered a foreign language well enough to be able to understand the news on the radio or television. It is plain to see then that the student reviewers' recommendation that the websites supplement the information they present and the range of services they offer with comprehensive coverage in other languages – with English as a minimum requirement – is certainly valid for many citizens in Europe. It can also be assumed that the student groups took their project work seriously and probably spent longer grappling with the sites than would many other citizens. From this we may conclude that making information intelligible is more important than merely providing it. The reviewers' recommendations are also transferable in terms of the request for website operators to develop a stronger orientation towards customers and users. This would be helped by having a full-spectrum feedback option of the kind that was positively rated in the Vienna and Brussels websites. Since, in the EU at least, citizens are invited to take part in consultations and discussions (European Commission, 2015), it should be possible to equate the interests of reviewers with those of citizens.

Scott et al.'s (2011) study of an evaluation of the citizen's perspective of E-Government success identified nine factors offering net benefits, consisting of thirty items overall: "Cost, Time, Personalisation, Communication, Convenience, Ease of Information Retrieval, Trust, Well-Informedness and Participate [*sic*] in Decision-Making". In the context of online travel agencies and the stimulus-organism-response (S-O-R) paradigm, Hsu et al. (2012) suggest that the agencies should provide excellent service quality because of their findings that service quality is more important than information and system quality in influencing customer satisfaction and purchase intention. From the point of view of E-Government services, Krishnaraju's et al. (2015) analyses show "that personalizing the Web by self-reference and content relevance has a significant moderator role in influencing the relationship between determinants of intention to use and behavioral intention in certain cases". So, in summary and in response to RQ#2, many aspects of the students' user experience and user ratings can be equated by and large with the interests of citizens in Europe, particularly as the students are also European citizens themselves. However, here further comparative studies of sociological factors in the context of socio-technological research are also required. It may be that differences are then highlighted in Europe, for example in data privacy and data protection. This topic is particularly important for the German reviewers, and probably also to a large extent for the German population as a whole. The anchor, Berlin, only places mid-table in this respect and is clearly surpassed by the Vienna website. Moreover, a fair number of the websites that were studied seem to be quite specifically oriented to their own clientele, whether by virtue of the scaling back or absence of foreign-language information or a reduction in the services on the government pages. However, the results of the student reviewers tend to indicate similar expectations with regard to user orientation, intelligibility, and effectiveness as detailed in the international *Zukunftsstudie* ("Study of the Future", Münchner Kreis, 2013): regardless of global differences, the trend towards simple, quick, and trustworthy processes is evident here. Nevertheless, more application research has to be done involving citizens, their needs and their concrete evaluation.

4.3. Findings for the evolved TEDS*MOODLE evaluation tool

Students rated the TEDS*MOODLE evaluation tool as a very good option for assessing IA. No problems were encountered when it came to directly applying it; it is easy to use and clearly structured.

In some individual cases there were a few minor technical difficulties: the time limit set up for the evaluation has now been turned off, as some reviewers needed significantly longer than anticipated. To date, neither an interim caching function nor the expected “back” button has been implemented. In terms of content, the students suggested an explicit option “cannot be evaluated” in addition to the Likert value 3 (“neutral”). A text field should also be provided requiring reasons to be given for this choice to prevent it being overused. In response to RQ#3, it can be said that TEDS*MOODLE is suitable in almost every respect as a scientifically based tool for evaluating the European websites. However, in order to make it freely available to citizens online as a pure web tool that is practicable and self-explanatory, the integration with the Moodle platform as originally intended (Scholl et al., 2014) must be discontinued. The student project thus brings into relief a) a possible practice giving concrete expression to the postulated unity of research and teaching via active student participation in scientific work, and b) the inspiration derived from this for ongoing research and development.

4.4. Findings for the establishment of research-based learning

In the course of this transformation in university teaching, there is a shift in the roles of teacher and learner. The learners are to study in a much more active and autonomous way in a variety of contexts and be able to solve problems. The teachers then evolve into facilitators and experiment with new didactic concepts. Externally funded projects can also form the practical basis of current (student) research methods in teaching. Not only can part 1 of RQ#4 – the question of whether this can be used to introduce students to scientific methodology and practical empiricism – be affirmed but it should also be noted that most students are committed to getting to grips with scientific methodology and seek to understand it through group discussion. Moreover, the student projects must be independently planned, carried out, and documented as a team with areas of personal responsibility assigned, and the work requires a relatively large investment of time. To avoid misunderstandings and to promote efficient performance – with an eye too to the final evaluation – the students would actually prefer *not* to experience all the disappointments, risks, and longueurs that are part and parcel of a research process and, as a result, expect to be guided by their teachers. With respect to part 2 of RQ#4 – the question of whether the students are prompted into independent research-based learning – it should be pointed out that in the limited time available, it is rather a case of genetic learning being consolidated in a practice-oriented way. For many students, there are clear shortcomings evident in their academic writing and in the readiness to invest extra time in subsequent ongoing work such as publications, so that as yet it has not proved possible to instigate a student conference paper.

5. CONCLUSION

As Scott et al. (2011) point out “the goals of e-Government are to improve the quality of the service, increase the efficiency of administrative processes and enable more effective participation and engagement with service users”. One difficulty for the administration and the government in making an assessment here is that different (organizational) groups, such as software developers or customers, define the success and failure of an IA in different ways (Dwivedi et al., 2015). Moreover, Dwivedi et al. (2015) also point to the fact that the introduction of a new technical system may lead to a change in organizational structure and culture and hence to a change in the way people think and work. With this in mind, it is not surprising that there are differences in the ratings of the four student project groups. What is more striking, though, is that there are clear agreements in the results of the independent student evaluations. That is probably due, among other things, to the students’ expectations of E-Government services informed by their course programme. However, the website that came out on top in this study, that of Vienna, clearly has a sound strategy that it can build on (Bundeskanzleramt Österreich). In her capacity as CIO for the City of Vienna, Ulrike Huemers (2015) stresses the fact that “the Digital Agenda Vienna is the product of the ‘new kind of thinking’ it is concerned with. It has not been developed behind closed doors but is rather the result of a collective working process.”

The cities' websites are their public faces and the literature research on E-Government is often focused on this so-called front office (Homburg & Bekkers, 2002). But the success of E-Government initiatives and front-end services requires integrated and efficient background processes in the administrations' "back offices" (Bekkers, 1998). This, in turn, requires process management methods that are developed consensually and with shared values (Homburg & Bekkers, 2002). The author sees a connection here to the varying levels of service that were found to be on offer in the European websites that were studied. This is because filling out forms online or booking appointments or purchasing goods also requires smooth integration of the front- and back-end processes. In our case, the cities need to build consensus with members of the public in terms of their understanding of the processes involved.

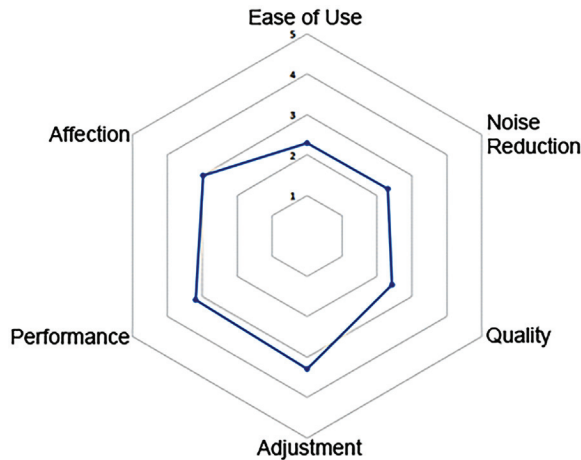
In their assessment of E-Government in Britain, Weerakkody et al. (2006) also show the need for effective process management in the public sector, which, for example, creates a connection between internal government systems and members of the public via online interfaces, enabling electronic transactions to be carried out efficiently: "It is clear that the effective delivery of public services will require harmonisation and integration of business processes and supporting IS/IT systems between various stakeholders such as, government agencies, business partners, employees and citizens." According to the student results, the London website satisfies many of the criteria that were tested and its average rating across all four groups puts it in second place. This would suggest that lessons have been learned in Britain from the inefficiency identified in previous research and practical remedies have been applied.

In some of the student evaluations, especially in the main category *Noise Reduction*, we may assume the influence of user technology and settings. The great variance in these evaluations is due to the fact that some reviewers had an ad blocker installed, while others did not. They also have a varying attitude to cookies, so that this has an impact on the storing of language settings. These kinds of specific, technical hindrances in HCI can be overcome by providing information and training and need to be differentiated from actual "barriers" created by hierarchical, personal, processor-related, or geographical constraints (Zheng et al., 2009).

In 2002 BITKOM presented a ten-point plan for "good e-government", which was not limited to Germany and appears to be still relevant in today's Europe (BITKOM, 2002): "Designing processes, creating transparency, enabling participation, integrating users, creating user standards, ensuring cooperation, tailored financing, service offers, building skills and competencies, and marketing plans". In this broader sense, most of the websites for the European capital cities still have their work cut out. In 2014, BITKOM formulated an IT strategy proposing that digital "infrastructures . . . [must] first and foremost be user-friendly and gain acceptance. Citizens only derive a direct benefit from infrastructures that are easy to use. They are never an end in themselves. They are the basis for implementing one's own ideas and business models, for managing one's affairs more efficiently, and for designing one's life in a more agreeable way. The key here is, above all, the use of smart networks. . . Communication in these smart networks must be secure. Compliance with high security standards is essential" (BITKOM, 2014). Although the evaluation results presented here show that the first aspect (*Ease of Use*) is by and large being fulfilled (see Figure 7), a number of websites still have shortcomings in terms of their security standards (see figs. 2–6). The new study results produced by Fraunhofer FOKUS in Germany (Nationaler Normenkontrollrat, 2015b) show that isolated flagship projects do not end up solving the actual problems involved in setting up effective E-Government. E-Government works most efficiently when it goes hand in hand with process optimization and enables administrative processes to be handled online in a seamless and consistent way (Nationaler Normenkontrollrat, 2015b, p. 16). This obviates the need to enter data several times over, is easily accessible via standardized user interfaces, is simple to manage, and offers citizens genuine added value – criteria that are also reflected in the ideas presented by the student reviewers.

In summary, the results of the student project groups show that E-Government administrative services are only presented transparently and intelligibly to a limited extent on the websites that were

Figure 7. Average ratings of the main categories across all four reviewer groups for all the websites



examined and only a few websites are customer-oriented and set up in an efficient way. Based on the detailed results produced by TEDS*MOODLE, many of them can be made easier to use and achieve greater acceptance amongst users by applying targeted changes. In some cities, like Vienna, London, and Berlin, it is more about making slight improvements, while for other websites, such as those of Sofia and Bucharest, the recommendation suggested by the results compiled here would be to rework the entire Internet presence. Moreover, tests conducted with mobile devices like smartphones and tablets show that, in this respect, many of the websites clearly need improving at the programming level. The author notes that a transformation process inherent in the paradigm shift that goes hand in hand with Web 2.0 (O'Reilly, 2007) is already affecting the younger generation's expectations as citizens, and this also applies to E-Government services. However, further research within the international context is required here.

Taking user-oriented evaluations on board means giving serious consideration to the concerns of users in the development and design of IA such as websites or IS in general. Involving them in the implementation of the associated demands and needs of individual citizens or user groups may help raise the quality of these IA. Across all the seventeen websites that were assessed and all four reviewer groups, the main categories *Ease of Use*, *Noise Reduction*, and *Quality* on average scored better than "neutral", while *Affection* was rated as neutral and *Adjustment* and *Further Performance Features* fared slightly worse (Figure 7). Of course, the significance of the results is circumscribed by the limited student target group. But Europe as a whole could further develop its E-Government competence by taking into account the nuanced evaluations of user experience and feeding these findings into the design of its electronic services. Moreover, we may assume that groups with knowledge of the particular language native to the website or who even come from the country itself will come up with different results. This may not only concern objective factors such as search results but also have a particular impact on the subjectivity of the assessment criteria *Affection*, in which a sociocultural dimension may also come into play. The author's research team has its sights set on these kinds of comparative pan-European evaluation studies, which can also be carried out on the international level using TEDS*MOODLE. However, further research of portal evaluation should consider Elling et al. (2012), who believe it is essential to use completely different methods in evaluating E-Government websites, as well as Bannister (2007), who concludes that "benchmarks are not a reliable tool for measuring real e-government progress".

Volkoff & Strong (2013) explain HCI as follows: "An actor looking at an object such as a technical artifact is likely able to identify a variety of possible affordances. Not only does the technical artifact

have multiple features that can be combined in various ways, but individuals operate simultaneously on their own behalf and as role incumbents in an organization, so have a variety of goals associated with their use of the technology.” Accordingly, the objective for the four student evaluation projects was identical, namely to evaluate seventeen websites of European capitals using sound scientific procedures and to put the TEDS*MOODLE tool through a practical test in the evaluation process. This tool has proved itself for the evaluation of IA and yields very sophisticated results and suggestions for improving the IA’s functionality and design. Besides the many individual factors that come out in practice as to how a website of this kind can be improved for such and such a clientele and the means and reasons for achieving this, a major challenge is posed, on the one hand by the language barriers and, on the other, by the inadequacies in personal customization options. This can lead to generally negative ratings in the category *Affection: User Satisfaction*. This means that the *user’s expectations* play a significant part in his or her nuanced evaluation of the websites. For example, many reviewers did not at first expect to find a shopping cart on an administrative website. However, the positive examples set by Vienna and London then changed their expectations. This accords with (Volkoff & Strong, 2013)’s idea that “the actualization of affordances occurs over time.” The students’ qualification must be scientifically ensured by the universities. In 1969, the BAK distinguished three related, yet distinct ways of learning at university (Bundesassistentenkonferenz, 2009, pp. 13–15): research-based learning as the highest level involves active participation in the current research in the discipline; genetic learning implies an independent understanding of important knowledge processes; critical learning means developing an awareness of the major questions and problems in the discipline. All three kinds of university learning are also included in a course of studies at a university of applied sciences. Concrete externally funded projects can be used as the starting point for autonomous student projects as a practical means to get students in training more actively involved in research processes, science, and knowledge management.

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APPENDIX

Project Groups VR 12

PG#1: P. Bartel, J. Meinhardt, E. Friedrich, S. Barsch, D. Alex, F. Metzendorff, M. Walther, Z. Özdem, A. Kurschat.

PG#2: F. Bernstein, N. Bleyer, S. Böhme, B. Hübner, D. Koch, U. Oelschläger, C. Poser, K. Sakolowski, R. Semmler.

PG#3: E. Schultz-Ehrenburg, T. Schäfer, C. Pusch, K. Schröder, H. Weizel, S. Schneider, S. Sellmann, N. Jahn, A. Kuthe.

PG#4: L. Mischke, J. Freiberg, J. Hartmann, A. Fiedler, A. Schäfer, J. Schmidt, A. Schwarzlose, T. Markert-Mesters, S. Kirch.

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