John Waithaka

assignment 5 - Accessibility

ICT In africa

## 1. CITATION/REFERENCE:

R. Habib, A. Inam, A. Ali, I. A. Qazi, and Z. A. Qazi, ‘A First Look at Public Service Websites from the Affordability Lens’, in *Proceedings of the ACM Web Conference 2023*, in WWW ’23. New York, NY, USA: Association for Computing Machinery, Apr. 2023, pp. 2731–2741. doi: [10.1145/3543507.3583415](https://doi.org/10.1145/3543507.3583415).

## 2. AUTHORS:

The authors of the paper are Rumaisa Habib, Aimen Inam, Ayesha Ali, Ihsan Ayyub Qazi, and Zafar Ayyub Qazi.

Rumaisa Habib, at the time of the paper's publication, was an undergraduate student at Lahore University of Management Sciences (LUMS). She is currently a PhD student at Stanford University and has four publications, according to Google Scholar. Most of her publications focus on web affordability and inclusiveness.

Aimen Inam is a member of LUMS in the Computer Science department. They have two publications, both co-written with Rumaisa Habib, that also focus on affordability and inclusiveness.

Ayesha Ali has been an Assistant Professor of Economics at LUMS for over 7 years. She holds a Master's in International Policy Studies from Stanford University and a PhD in Economics from the University of Toronto. According to Google Scholar, she has 17 publications that primarily focus on Development Economics.

Ihsan Ayyub Qazi has been an Assistant and Associate Professor of Computer Science at LUMS for over 12 years. He has a PhD in Computer Science from the University of Pittsburgh. He has 66 publications, according to Google Scholar. Part of his research focuses on the societal impact of technology and the interplay between technology and public policy.

Zafar Ayyub Qazi has also been an Assistant Professor of Economics at LUMS for 6 years. Before this, he was a Postdoctoral Researcher at the University of California, Berkeley for a year and a half. He has a PhD in Computer Science from Stony Brook University in New York. His research focuses on computer networks but also on improving access to Internet content in developing countries.

## 3. FUNDING AND CONFLICTS OF INTEREST:

The authors do not report on the research’s funding. Also, no conflict of interest is reported, nor was any identified.

## 4. PUBLISHER:

The publisher of the paper is the Association of Computing Machinery (ACM). ACM is selective in its publication process, as it requires expert peer reviews before accepting a paper for publication.

The paper is a peer-reviewed conference paper that was presented at "WWW '23: The ACM Web Conference 2023".

## 5. PURPOSE:

The paper is an original research article that aims to answer the question, "How affordable is access to public service websites in developing countries?" The research analyzes the affordability of public service websites by considering their sizes and broadband affordability in individual countries.

Secondarily, they seek to answer the question, "What is the cause of the low affordability of access to public service websites in developing countries and how can it be improved?”

## 6. RESEARCH METHODS:

The paper describes two main methods used: collection and analysis of webpages and conducting interviews.

**Collection and Analysis of Webpages**

The researchers selected 9 developing countries in Asia and Africa and 9 developed countries for the study. They collected these countries’ public service websites from official government gateways and through web scraping. They also collected the top 100 popular local and global websites based on Alexa website rankings. The developed country websites and globally popular websites served as baselines for comparing the affordability of public service websites in developing countries.

The researchers collected data on various features of the collected webpages, such as total webpage size, number of different web objects requested (e.g., images, CSS, JS, fonts), size of individual web objects, image formats, and image resolution. They used WebPageTest to collect this website feature data, accessing the webpages on a Nexus 5 device in Google Chrome.

The PAW Index was used to analyse the affordability of access to websites as a factor of a country’s webpage sizes and broadband affordability.

**Interviews**

A major assumption made is that an increase in webpage size leads to a decrease in the affordability of accessing it.

Furthermore, since the research used only the landing pages of the collected websites for the analysis, another major assumption made was that the landing pages were representative of the entire websites.

Lastly, since the findings are presented as generally true for all developing countries, the research assumes the sample of 9 developing countries is sufficiently representative of all developing countries.

## 7. MOST IMPORTANT FINDINGS:

The most important findings are the following:

* Public service websites (PSWs) in developing countries are unaffordable (according to the PAW index). The PAW index analysis found that the sampled developing countries required a reduction of 1.2 to 11 times in size to meet the UN-proposed website affordability target. The research also found that PSWs in developing countries were considerably larger than PSWs in developed countries and the top 100 locally popular websites.
* The size of images used on PSWs in developing countries contributed the most to the overall size of the websites (63%). It was found that though PSWs in developing countries had fewer images than the top 100 locally popular websites, they had 204% more total image size. It was also found that the image resolution of images on PSWs in developing countries was, on average, 3.2 times higher compared to the resolution of images on the top 100 locally popular websites.
* Reducing image resolution by 50% and using the WebP image format could bring developing countries significantly closer to meeting affordability targets for accessing PSWs

## 8. WEAKNESSES:

The identified limitations of the paper are:

* The analysis of websites only used the website’s landing pages. This may reduce the accuracy of the findings. It is possible that landing pages have more images than the rest of a website to please first-time users. It is also possible that long-time users do not visit landing pages often but go straight to the content they want.
* The paper did not consider the impact of caching on webpage size and affordability. Caching can significantly reduce the size of web pages for returning users, potentially improving affordability.
* Interviews were conducted only with maintainers of Pakistan public service websites, which limits the generalizability of some of the findings to other developing countries.
* The sample of developing countries used, though it covers 27% of the population, is of only 9 countries. This limits the generalizability of the findings to all developed countries.

## 9. BROADER IMPLICATIONS:

We have previously identified low affordability as one of the barriers to Internet use in Africa [1]. Based on the findings of this paper, it is highly likely that a lack of simple web optimization is one of the problems contributing to this affordability issue. This suggests that there are easily achievable improvements that can be made to achieve digital equality in Africa. In addition to web optimization, other easily achievable improvements, such as content translation, can be implemented. These improvements may not only reduce the digital divide in Africa but also create employment opportunities in the field of ICT for African youth.

**REFERENCE**

[1] C. Chair, “Internet Use Barriers and User Strategies: Perspectives from Kenya, Nigeria, South Africa and Rwanda”, Research ICT Africa, Cape Town, South Africa, 2017