

Terms of Reference

Appointment Type: Short Term Consultant (STC)

Specialization: Data Analyst

Practice Group/Unit: East-Asia and Pacific Chief Economist's Office (EAPCE)

Location: Consultant can be based anywhere – working with colleagues in Washington DC and Malaysia.

Duration: Up to 40 days, April 2021 - June 30, 2021

If you're interested, please email a short cover letter and CV, outlining your data skills and experience, to Yu Cao ycao5@worldbank.org and Jonathan Timmis jtimmis@worldbank.org by 21st April.

Project – “Global Digital Divides”:

I. Background to the Project

- The project plans to look at East-West divides in technology, focusing on East Asia and Pacific, and whether this matters for subsequent technology adoption and productivity of firms in the region. We know there are signs of rising divisions in digital infrastructure e.g. 5G. This project intends to look at whether we see divides in firm technology adoption, in the choice of software providers, hardware providers, platform use and so on? If it exists, where does this exist? What are the implications for future technology adoption – is it harder to switch to technology providers from other regions – and what does this mean for firm performance?

II. Objective of the Assignment

- At the World Bank we have access to two datasets on firm technology adoption that list several thousand individual technologies, both hardware, software and online technologies, and we know the exact individual technology provider (e.g. Asus, Google, Amazon Web Services etc...). The objective of the assignment is to identify the headquarter country of each technology provider firms, and also their subsidiary office locations. For standalone firms the location of the headquarters is straightforward, but for firms that themselves part of multinationals – the headquarters of the multinational parent firm is also needed.

III. Job Scope

- Task 1 – Matching Technology Providers to Firm Location Data:
 - The starting point is the list of individual technology providers, provided by the Task Team Leader. The Consultant will use the names of technology providers (e.g. Google), to match to a large dataset on firms and all their subsidiary office locations across the globe (e.g. Orbis). The Consultant will need to clean the firm names and employ string matching techniques.
 - For most of the technology providers we also have information on their website address. Depending on the quality of coverage of the string matching, the Consultant may need to scrape / fill-in additional location information from the provider websites.
- Task 2 – Technology Providers that are Part of Multinationals
 - Many technology firms are part of groups, which means we also need to know the ultimate parent firm of each technology provider (e.g. from the World Development Report 2021 we know that what can look like local platforms are actually owned by a handful of Chinese or US tech firms). The second task will require matching the

technology providers to detailed ownership data (e.g. Orbis), again string matching using firm names.

- Depending on the quality of the string matching, the Consultant may need to scrape / fill-in additional information from the web (e.g. financial statements).

IV. Deliverables

- The two tasks are expected to lead to the following deliverables:
 - A file of firm technology providers, their headquarter location, their subsidiary office locations, and their parent firm headquarter location (for firms part of multinationals).

V. Selection Criteria

The project team is looking for an experienced data analyst who meets the following criteria:

- Excellent knowledge of string-matching big data, experience using string languages across several countries would be a plus.
- Expertise using firm-level data would be a plus
- Master's degree in a relevant discipline, plus a minimum of 3 years relevant work experience; or a Bachelor's degree in a relevant discipline and 5 years of work experience.
- Attention to detail, with an organized approach to data cleaning and coding.
- A self-starter with the ability to solve problems, and strong investigative and research skills.
- Excellent interpersonal and teamwork skills.
- Fluency in English.

VI. Budget & Level of Effort

- The initial contract is estimated to be for up to (40) forty days. The budget will be based on the World Bank Group's fee schedule. The contract may be renewable thereafter, subject to budget and performance.

VII. Ownership of Work Product

- All data, materials and code produced or acquired during the appointment - shall remain the property of the WBG. Information shared with the consultant will be considered confidential, and circulation beyond agreed upon parties explicitly forbidden.

VIII. Reporting

- The Consultant will report to Yu Cao, Economist, EAPCE. Jonathan Timmis, Economist, EAPCE, is the Task Team Leader for this project.