

SPECIFICATIONS: PHASE 2 WEB DEVELOPMENT OF A SPATIAL ANALYTICAL TAX PORTAL

1. Background:

South Africa produces regular data on the state of the national economy but very little is known about the economic geography of its cities or regions. Municipal managers and local officials are required to plan for more productive, inclusive and sustainable economies yet lack credible information about the 'what' and 'where' of jobs and investment. Businesses and other local stakeholders lack the evidence base from which to advocate for change or hold leaders to account. Whilst Statistics South Africa collect highly disaggregated household and demographic survey data, such as through the Census, regular sub-national firm-level data does not exist. Yet deep spatial inequalities are an important legacy of apartheid and continue to undermine developmental outcomes both within and between places. Businesses also complain bitterly that local decision-makers do not appreciate or understand the importance of local economic success. Therefore the creation of robust disaggregated and granular economic data are essential for monitoring changing economic conditions and sectoral and spatial shifts over time. Improving the economic performance of every municipality and province would transform national outcomes.

Since 2015 National Treasury and SARS have collaborated with the United Nations University World Institute for Development Economics Research (UNU-Wider) to establish a panel tax data set, created by merging four tax data sources – company income tax data, employee income tax certificate data, VAT data, and customs records. The updated SARS-National Treasury Panel has anonymised firm and individual tax level data, and may be accessed through a secure data facility at the National Treasury as part of further collaboration with UNU-Wider collaboration. National Treasury and SARS also partnered to geo-code the anonymised tax data included in the SARS-NT panel, enabling its utilisation for more granular spatial economic research and analysis.

In July 2021, the National Treasury (NT) and Human Sciences Research Council (HSRC), entered into a partnership, with objective of creating an **open access spatial tax panel** for metropolitan municipalities. The work so far has helped i) demonstrate the potential of the NT-SARS panel for sub-national data ii) reaffirm the large demand amongst policy-makers, practitioners and academics for accessing this type of data iii) confirm the need for training/capacity-building in making best use of the data iv) confirm the need for concurrent intelligence/systematic analysis of the data.

2.1 Overview: core requirements

The HSRC seeks to appoint a capable service provider with experience in **web development AND data analytics** to assist in the *second phase* of its web development of a spatial tax portal.

The core tasks include:

1. **Expand on 'Map Explorer':** Updating the existing metro explorer tool to draw on all csv in the spatial tax panel; enhance some of basic user features
2. **Creation of 'Explore my municipality' dashboards:** co-creation of a curated or question-based user journey of interactive graphics based upon the spatial tax panel. We envision x6 dashboard panels for exploring six main topics
3. **Developer ops/support/maintenance** for 3x months post launch.

Note that there will be some flexibility in ensuring a reasonable workload in achieving these outcomes.

2.2. Overview of work completed in Phase 1:

Please see <https://hsrc.blsky.co.za> for Beta version

- **Technology Stack**
 - React.js / D3.js / Uber's h3.js hex library
 - Mapbox.gl with Deck.gl
 - Django and Django Rest Framework (DRM)
 - Python
 - MS SQL
- **Unique aspects of the Project**
 - Data Architecture
 - A portion of the 52 CSVs (2.5GB) (17 Metro, 17 Hex) provided are used for the display of each visualisation in the "Map Explorer", at the aggregation level. This means contrary to typical database querying; data is provided in aggregated form. Effectively each CSV matches with a table in the Db
 - CSVs can be replaced through an upload tool. This replaces the data the dedicated table.
 - The same 52 CSVs (17 Metro, 17 Hex, 18 Post Code) are also made available for upload through the "Download Data" section of the website. In order to download these CSVs a user will need to log in first.
 - In order to manage the alignment of CSVs, Tables and API querying from the FE a 'Configuration Table' was employed to maintain this logic, within which includes the hierarchy drop down levels of the Filter required for the Map Explorer.
 - The largest is CSV approx. 2GB
 - Total Db size approx. 6GB
- **Features Built**
 - Configuration Management
 - Upload CSVs
 - Edit Configuration Table fields
 - Set CSVs for exclusion from Download and Map Explorer filter selection
 - Currently, completely new CSV's require a new table to be manually added to the DB along with the coding of a new DRM API route which handles the necessary logic and feeds the data to the React.js front end.
 - Django Rest Framework

- APIs to handle all CSVs and other filtering or file download needs for the Front End
 - Download Data
 - Download Options (After login)
 - Find a File / Download all CSVs / Download Meta files
 - Download History
 - Ability to view download history at User and Admin level
 - User
 - Registration with tokenised email verification and welcome email.
 - Basic profile details management
 - Admin Area
 - Manage Datasets/CSV upload
 - Manage Configuration Table Edits
 - Manage Users
 - Download History Report
- **Map Explorer UX**
 - Overview
 - Once the required Filter selections are made, the user can use the Display button to update the Map view.
 - The settings cog on the Colour Legend opens additional options allowing the user to customise the view to their needs.
 - Filter (pivots off 'Config table', required shown with *)
 - Metro* (All or select one of 8 metros)
 - Output* (FTE, Firms, Median, Gini)
 - Temporal* (Only 'year', excluded from selection in Phase 1)
 - Aggregate* (Varies according to upper selections, e.g. None, Industry, Wageband, Agegroup, Gender, and more)
 - View As* (Various, e.g. Absolute (default), Absolute Change, Percentage Change)
 - Year*
 - Second Year (For change based 'view as' selections)
 - Legend
 - Continuous Colour Scale
 - Linear/Log scale toggle
 - Min/Max Slider
 - Opacity Slider
 - 3D toggle
 - Monotone colour toggle
- **Application Hosting**
 - Web portal hosted by University of Free State (HSRC/UFS Chair in City-region Economies) [hosting of the website is NOT part of the work required in phase 2]
 - Ubuntu Linux Server for files and scripting
 - Separate MSSQL server for DB

2.3. Work required in Phase 2

- **Technology Stack**
 - *Alignment with phase 1 (see details above)*
- **Unique aspects of the Project**
 - Data Architecture
 - Add an Additional 18 Hex CSVs and 18 Metro CSVs, i.e. new db tables, new api routings and adjustments to filtering logic.
 - Total of 35 Metro CSVs will become larger to include all municipalities, i.e. 8 metros will become **213 municipalities, national view**.
 - There is no more Hex CSV data other than the existing 8 metros.
 - Largest CSV file is **20Gb**
 - Total CSV's size together will be approx. +-**26 GB**
- **Performance**
 - Ensure performance of querying data as dataset size increases across national and metro level.
 - Basic Google analytics reporting: i.e. number of web visits per month, which countries etc.
- **Post Launch Support**
 - Developer support and maintenance for 3 months post website update launch.
- **Features to build**
 - **Component 1: 'Map Explorer' view expansion**
 - This expands on the existing toolset.
 - Increase National view (municipal shaped data), from 8 municipalities to **213**. This is when the viewport is looking at the whole Country.
 - NOTE: No Increase in Metropolitan Municipality view (hex shaped data), stays as 8 metros. This is when the viewport is looking at a single metro only.
 - Temporal month to be added for FTE Hex and Metro data
 - Export/import status, youth indicator status still need to be added for Hex (Only Metro, 8) and Municipal (213).
 - Additional 'View as' options: "percentage of municipality within aggregate" as well as "percentage of all aggregate within area"
 - Additional colour palette update: red-white-green centred on zero for all views of changes over time.
 - **Component 2: 'Explore my municipality' dashboards (i.e. a curated or question-based user journey): x6 dashboard topics**
 - This is an entirely new toolset.
 - The expected User Experience starts with selecting the municipality of interest in the first step:
 - This could be one of the **213** District Municipalities or **8** Metro Municipalities.
 - We are accessing the existing CSV datasets within the Config Table. We would be transforming the data to our needs to tell a story.

- The x6 dashboard panels present the visualisations in reference to the municipality chosen in the first step
- Six dashboard panels visualising the data to be created:
 - The HSRC would take the lead to provide clear guidance on the sorts of figures/tables/graphs/maps which best explain the data. However, this is still an interactive process of co-creation with the developer team.
 - Each dashboard panel would have x1 main 'interactive' or dynamic graphic/figures (with toggling/filtering abilities) e.g. tree map overview of industry where you can then select to view in more detail per sub-sector
 - Each dashboard panel would also include x2 accompanying 'mini' tables/figures (these should be straightforward although would still depend on which municipality you pick to explore)
 - For example for the dashboard on 'economic growth' we might develop x1 interactive figure showing economic growth for the municipality selected with interaction toggles i) that fade in or out comparison groups ii) switch between firm growth and employment growth. We might also include x2 'smaller' figures showing the wage distribution in the metro and the age profile [no filtering/toggles here].
- The six dashboard panels topics need to be finalised together but would probably include: i) economic growth ii) export performance iii) spatial inequality iv) youth employment v) industrial clusters vi) economic density in space
 - NOTE: A few of the dashboard panels may only be available when selecting a metro because only metros have hex level data.

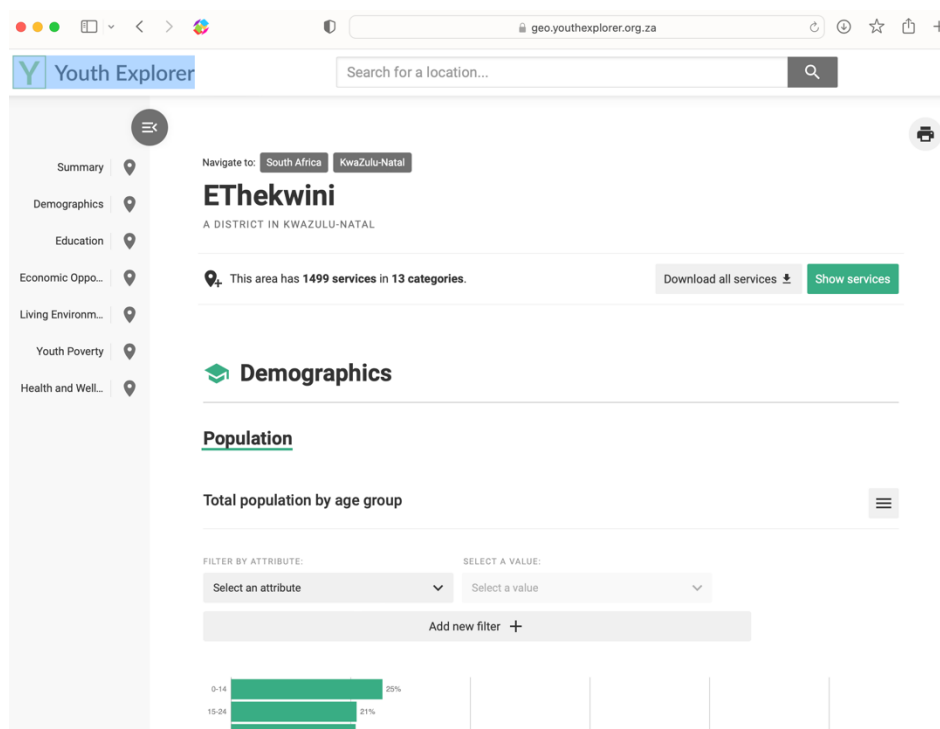
Examples of interactive dashboard displays for Component 2:

We envision the product being a mixture between what is showcased for the 'youthexplorer' and 'metroverse' and 'atlas of economic complexity'

Youth explorer example:

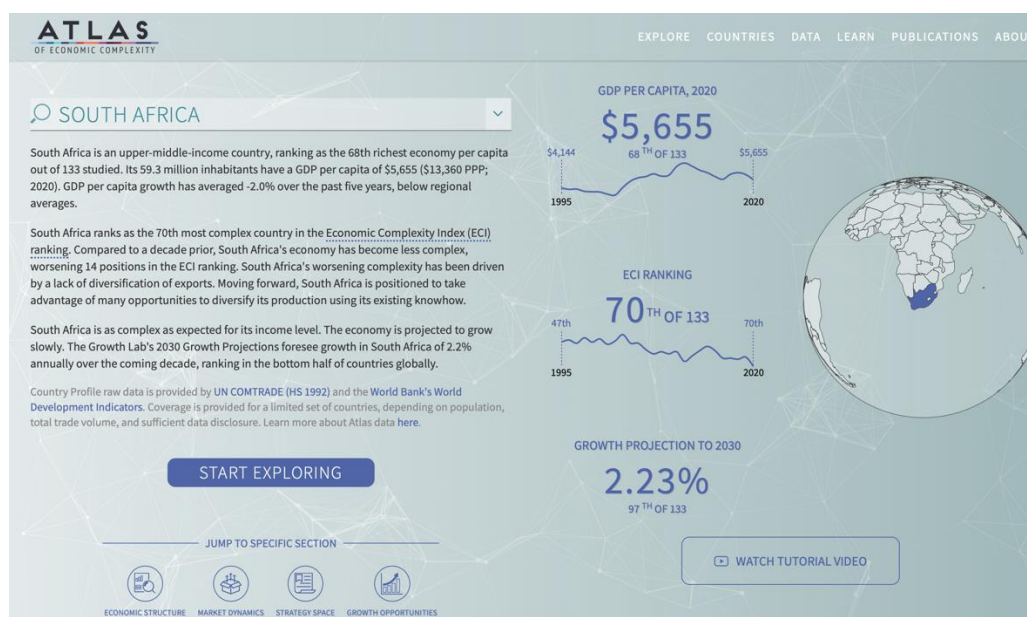
Go to: <https://geo.youthexplorer.org.za/#geo:ETH> (click on 'rich data')

- this case displays a large amount of information but the figures/tables are visually unappealing and very simple. It is not question focused.
- there is some nice flexibility on some of the figures to allow deeper filtering



Atlas of economic complexity example:

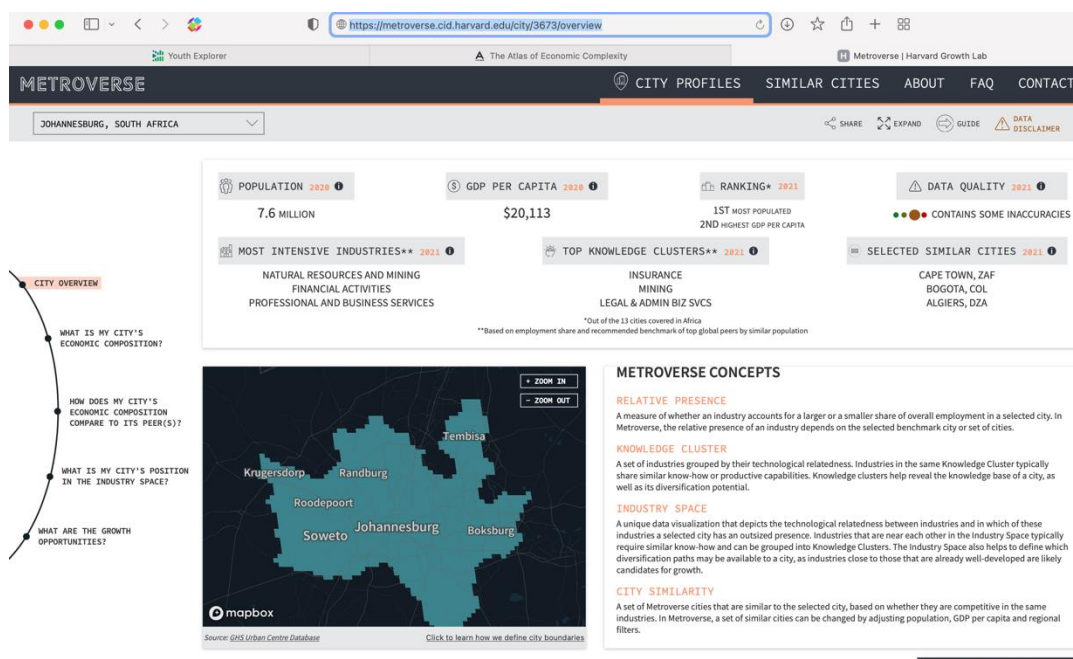
Go to <https://atlas.cid.harvard.edu/countries/246> (click on 'start exploring')



- this is a very good example of the sort of journey/UX we'd like to aim for
- the figures/graphics have been carefully selected to highlight the most valuable information.
- some figures/graphics a high degree of sophistication/custom design with neat interactive components

Metroverse example:

Go to <https://metroverse.cid.harvard.edu/city/3673/overview> (toggle through 5 windows in semi-circle on left)



- this is also a good example of what we want to achieve
- there are a carefully selected number of figures/graphs with some interactivity
- some of these have a custom-design
- we may want to include a few more figures of a more routine composition to provide more detailed information.

3.1 Quotation requirements:

Please provide the following in your quotation:

- **Company experience and examples of any related projects**
- **Qualifications and experience of the developers assigned to this project**
- **Breakdown of prices**

Please note that the HSRC is a research institution and therefore value for money is essential. The facilitation of access to free public data is intended as a public good.

3.2 Timelines

Note that the project MUST be completed by the end of February 2023. The bidder will fail to meet the minimum technical requirements if the project cannot be delivered on schedule.

3.3 Reporting

The service provider will liaise with Dr Justin Visagie, Senior Research Specialist, Inclusive Economic Development, HSRC

3.4 Evaluation Criteria

The RFQ will be evaluated on the following functionality criteria:

The evaluation criteria for functionality aim to assess the bidder's capability, reliability and ability to execute and maintain a bid and / or contract. The minimum number of points that bidders have to obtain in order to B-BBE and price evaluation is 70. Bids that score less than 70 on functionality will be disqualified and will not progress to evaluation on Price and B-BBEE.

CRITERIA	Weight
Functionality	
Track record of the bidder on Web site design The bidder must provide three (3) contactable reference letters to demonstrate track record on Website design and maintenance of similar size (public or private). The reference letters must be on the bidder's client letterhead, dated duly signed by an authorized person reflecting the level of service and performance provided by the bidder Points allocation: No reference letter = 0 points 1 reference letter = 5 points 2 reference letters = 10 points 3 reference letters = 15 points	15
Experience of the company in Website design The bidder must provide a company profile demonstrating experience in website design. The profile must demonstrate a list of clients for similar services and the years the services were provided, company organogram and list of key resources. Points allocation: Less than five years = 5 points 5-7 years = 10 points More than 7 years = 15 points	15
Capacity and experience of the proposed team and project manager The team and project manager who will be allocated to the HSRC account must have a relevant qualifications with a minimum of 3 years' experience in business processes as per scope of work. The experience must be demonstrated by provision of a recently updated CV and qualifications	20

<p>Points allocation:</p> <p>Less than five years = 10 points 5 -10 years = 15 points More than 10 years = 20 points</p>	
<p>Methodology and approach of the bidder</p> <p>The bidder must submit a comprehensive technical proposal where the bidder is required to demonstrate understanding and response to the scope of work, methodology, implementation plan and the approach on how the project will be managed through its entire life cycle according to the following key aspects:</p> <ul style="list-style-type: none"> ➤ Comprehensive project plan ➤ Detailed business process mapping methodology and response to the scope of work ➤ Inclusion of a draft SLA with detailed work plan <p>Points guidance allocation: Good methodology and approach= 50 points Fair methodology and approach = 25 points Poor methodology and approach = 10 points No methodology and approach = 0 point</p>	50
TOTAL (Functionality)	100

Bidders should obtain a minimum of 70% on functionality in order to be considered for price and B-BBEE.

Briefing session date: 14 October 2022 (Virtually)

Time Slot for the Briefing session: 11:00-11:40 am

Meeting Link : https://teams.microsoft.com/l/meetup-join/19%3ameeting_YWJkMmUzYWQtdODFhNC00MGU4LWI5YjUtYWY4MWExMTkwNmVh%40thread.v2/0?context=%7b%22Tid%22%3a%22161524ab-4f53-4300-a494-dcdbaeb8e86c%22%2c%22Oid%22%3a%222e330870-e6d4-4756-83f8-a62a8da8e640%22%7d

Closing date for proposals: 24 October 2022

Proposals /Quotation to be sent Ms Zanele Nkosi : znkosi@hsrc.ac.za

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