

Four organic, rounded shapes in shades of green and teal are scattered around the central text. One is at the top, one on the left, one at the bottom, and one on the right.

openup:

Moving everything towards **open**.

www.openup.org.za

A large, thick, white curved shape resembling a stylized 'C' or a partial circle is positioned on the right side of the image.



Lessons building an accessible budget data portal

JD Bothma | October 2022

//

A South Africa where citizens and government
are empowered to thrive, collaboratively

Vision

THE 2022 NATIONAL BUDGET HAS BEEN PUBLISHED

2022 Budget is online

Budget speech video

Budget resources

BUDGET FEATURE

See the summary of each department's budget on the department pages

See departments →



Consolidated Budget Summary



Original budget ▾

2022-23 ▾

Consolidated Budget Summary

R2.2 trillion

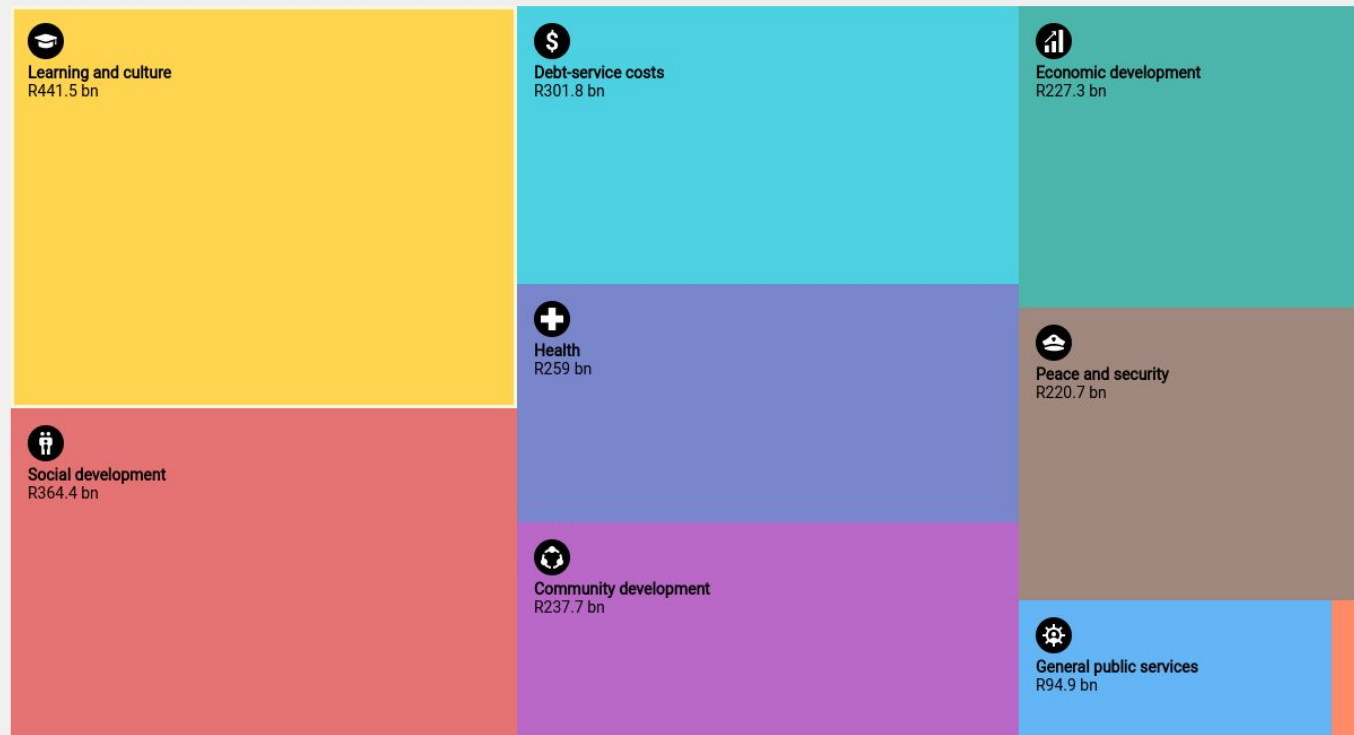
Explore this focus area →



Learning And Culture

R441.5 billion

Explore this focus area →



This talk might help...

- Building data-driven tools/sites
- Humans curate your data
- Contracting with government

Primary Audience - User Personas



Potential to use
budget data and do analysis

Already using
budget data and doing analysis



The Data Journalist



The Data Scientist



The CSO Leader



The Trainer



The Economist



The Analyst

Public Finance Knowledge	lower					higher
Representative Role	Journalists and media working with budget data and analysis	Private sector data analysts that provide analytical support	Organisations representing collective interests and advocacy	Civil Society budget analysts, researchers and trainers	Private sector data owners and analysts	Public sector data owners and analysts
Key Needs	Analysis, Analysis support, high and mid level data	Structured data, analysis reference & support material	High level data, analysis	Public finance training materials, structured data	Structured data, analysis	Structured data, analysis

Vulekamali Key Value Propositions

Data, analysis, discovery, educational materials



Show data for a financial year

2019-20

2020-21

2021-22

2022-23

Department Budgets for 2022-23

Start typing to find a department budget

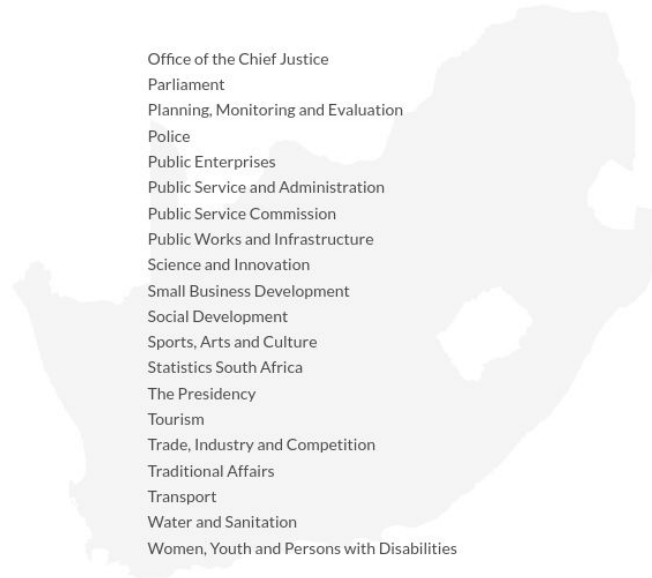
in

All spheres of government

National Department Budgets

Agriculture, Land Reform and Rural Development
Basic Education
Civilian Secretariat for the Police Service
Communications and Digital Technologies
Cooperative Governance
Correctional Services
Defence
Employment and Labour
Environment, Forestry and Fisheries
Government Communication and Information System
Health
Higher Education and Training
Home Affairs
Human Settlements
Independent Police Investigative Directorate
International Relations and Cooperation
Justice and Constitutional Development
Military Veterans
Mineral Resources and Energy
National School of Government
National Treasury

Office of the Chief Justice
Parliament
Planning, Monitoring and Evaluation
Police
Public Enterprises
Public Service and Administration
Public Service Commission
Public Works and Infrastructure
Science and Innovation
Small Business Development
Social Development
Sports, Arts and Culture
Statistics South Africa
The Presidency
Tourism
Trade, Industry and Competition
Traditional Affairs
Transport
Water and Sanitation
Women, Youth and Persons with Disabilities

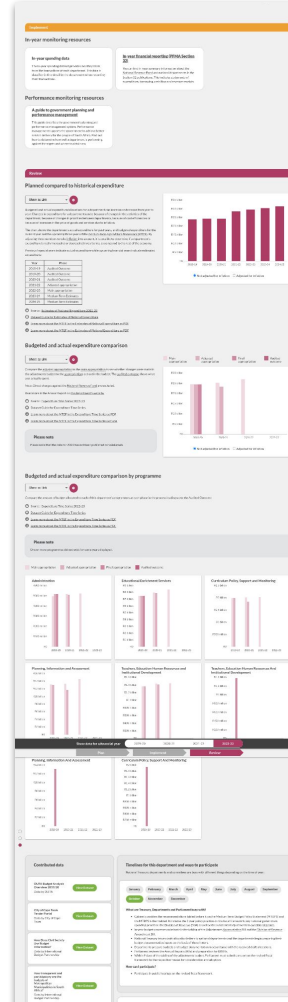


Intro/explanation,
Links:
PDF
Excel (humans)
Data slice (robots)



Budget summary

Relevant data
and guides



Budget time
series

Budget vs actual
comparison

/	Homepage
/ <financial_year> /departments	Department listing
/2022-23/departments	
/ <financial_year> /departments/ <sphere> / <government> / <department>	Department page
/2022-23/national/departments/ basic-education / /2021-22/provincial/eastern-cape/departments/ education /	
/datasets	Data category listing
/datasets/ <category>	Dataset listing
/datasets/ procurement-portals-and-resources	
/datasets/ <category> /dataset	Dataset overview
/datasets/procurement-portals-and-resources/ deviations-from-procurement-processes	
/learning-resources/guides/ <guide>	Dataset guide
/learning-resources/guides/ division-revenue-raised-nationally /	

Deviations from procurement processes

What is this?

Requests from national departments, public entities, Constitutional institutions and provincial treasuries to deviate from standard bidding processes when procuring goods or services. Provincial institutions should direct their requests to the relevant treasuries.

Quarter	Department/Entity	Project Description	Supplier	Value of Contract	Reason for Requesting Deviation	Date of Request	Whether Treasury supported the request	Contract start and end date
Q1 2024	Department of Health	Procurement of medical equipment	ABC Medical Supplies	R1,200,000	Supplier has exceptional skill	2024-01-15	Yes	2024-02-01 to 2024-03-31
Q2 2024	Department of Education	Procurement of school uniforms	XYZ Textiles	R500,000	Supplier is the only one capable	2024-02-20	No	2024-03-01 to 2024-04-30

Key points

1. An open bidding process is best practice to ensure that the services government receives are at a competitive price.
2. Departments/entities may request approval to deviate from standard procurement processes. The National Treasury can support, support with conditions or not support the requests.
3. An example of a deviation request is asking for permission to contract another organ of state to do the work.
4. When a department/entity requests permission to single source a supplier of a good/service, it may be justified if the supplier has exceptional skill or is the only supplier capable of delivering the good/service.
5. Deviations should be the exception rather than the norm and should not be requested frequently.

Quarter	Department/Entity	Project Description	Supplier	Value of Contract	Reason for Requesting Deviation	Date of Request	Whether Treasury supported the request	Contract start and end date
Q3 2024	Department of Transport	Procurement of bus services	DEF Transport Solutions	R3,500,000	Supplier has exceptional skill	2024-07-10	Yes	2024-08-01 to 2024-12-31
Q4 2024	Department of Social Services	Procurement of social grants	GHI Social Services	R2,100,000	Supplier is the only one capable	2024-10-05	No	2024-11-01 to 2025-01-31

Why is it important?

If a department or entity is frequently requesting approval to deviate from standard procurement processes, it can be an early warning sign that the procurement function is not planning its procurement adequately. It can also serve as an indication of possible poor governance practices and service delivery issues.

What can it be used for?

The quarterly deviations reports list the department/entity requesting deviations, the project description, the supplier, the value of the contract, the reason for requesting the deviation, the date that the department/entity made the request, whether Treasury supported the request and the contract start and end date. This information can be used to gain a snapshot of the procurement practices of departments/entities. The information can be analysed in conjunction with National Treasury guidelines for managing deviations, contract variations and expansions.

Deviations from procurement processes

Share this page:

Share as Link



Learn more

Find out how to ensure a procurement process was fair and legal, and where to look for more information.

Dataset guide

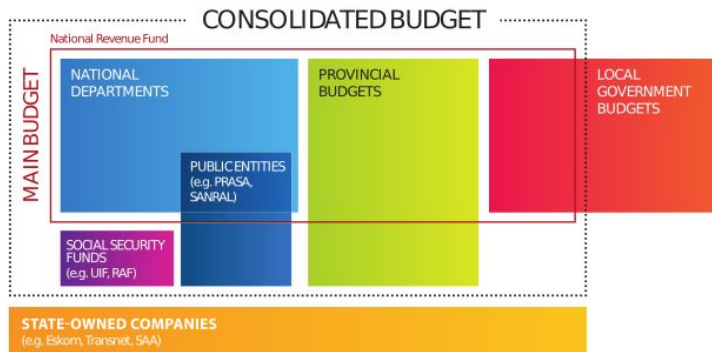
How can it be accessed and used?

1. Visit [National Treasury's OCPO website](#)
2. Go to Suppliers Area

Division of revenue raised nationally

Overview

The Constitution provides for the division of revenue between and among the three spheres of government on an annual basis (Sections 214(1)(a) to (c)). See the Budget Highlights and Budget Review for the sources of nationally-generated revenue. Provincial and local governments can also generate their own revenue. See the [provincial department budget documents](#) and the municipalities on [Municipal Money](#) for a summary of their various revenue sources.



While the Equitable Share allocates more money to the National sphere (national government departments), much of that is then transferred to provincial and local governments via Direct Charges to the National Revenue Fund and Conditional Grants.

Conditional grants

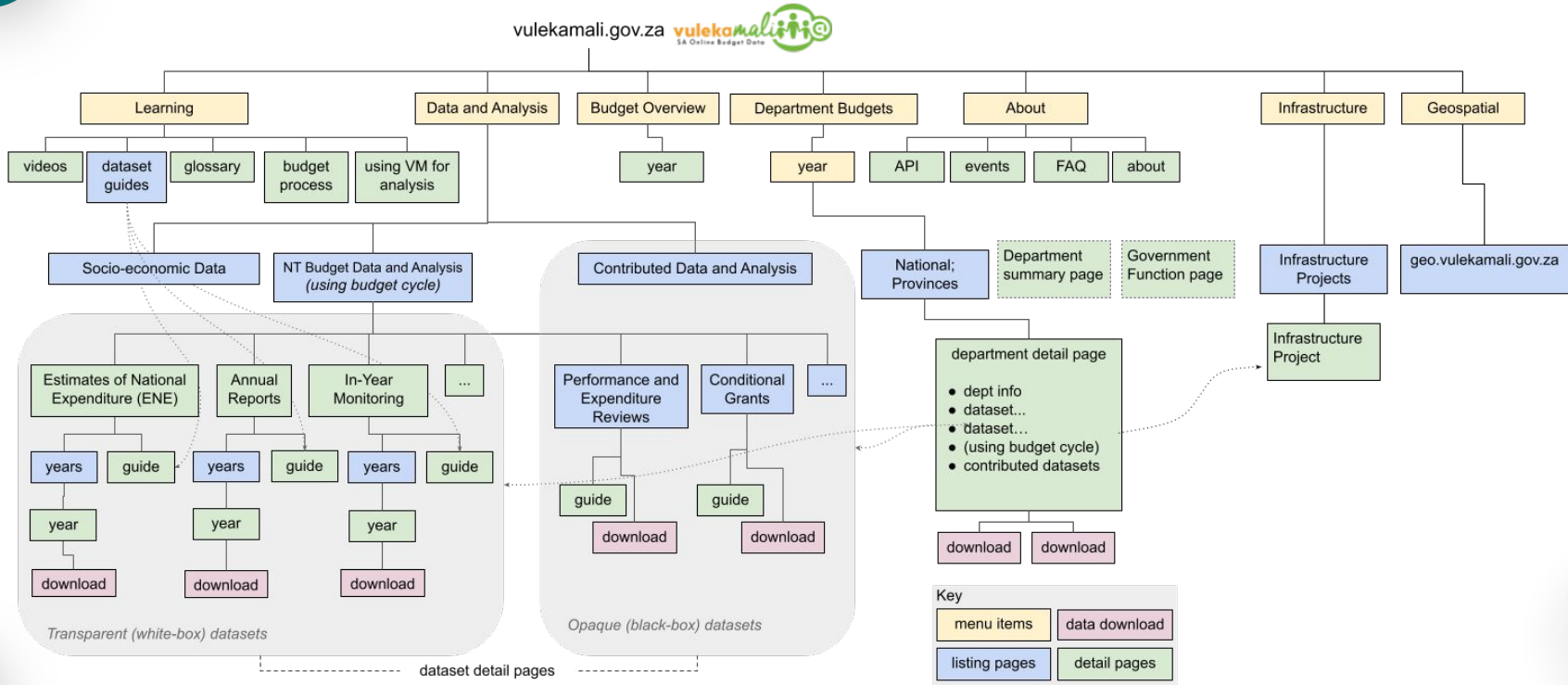
Conditional grants are administered by national government departments and allocated to provincial and local governments for their specific purpose based on an accepted business plan for the grant's use. See the frameworks for conditional grants to [municipalities](#) and [provinces](#). You can find the allocations for each conditional grant in the annexures and schedules of the [Division of Revenue Bill](#).

Note: This shows the Division of Revenue Bill and does not include the adjustments in the Division of Revenue Amendment Bill [Bill 09 of 2020] tabled



Information Architecture

Information Architecture



Information Architecture

- Which pages exist, where
 - /2019-20/national/departments
- Journey around site
- The words we use
 - “Estimates of national expenditure”
 - “National Budget”
- Balance
 - The real world
 - The user’s mental model
 - The data realistically available

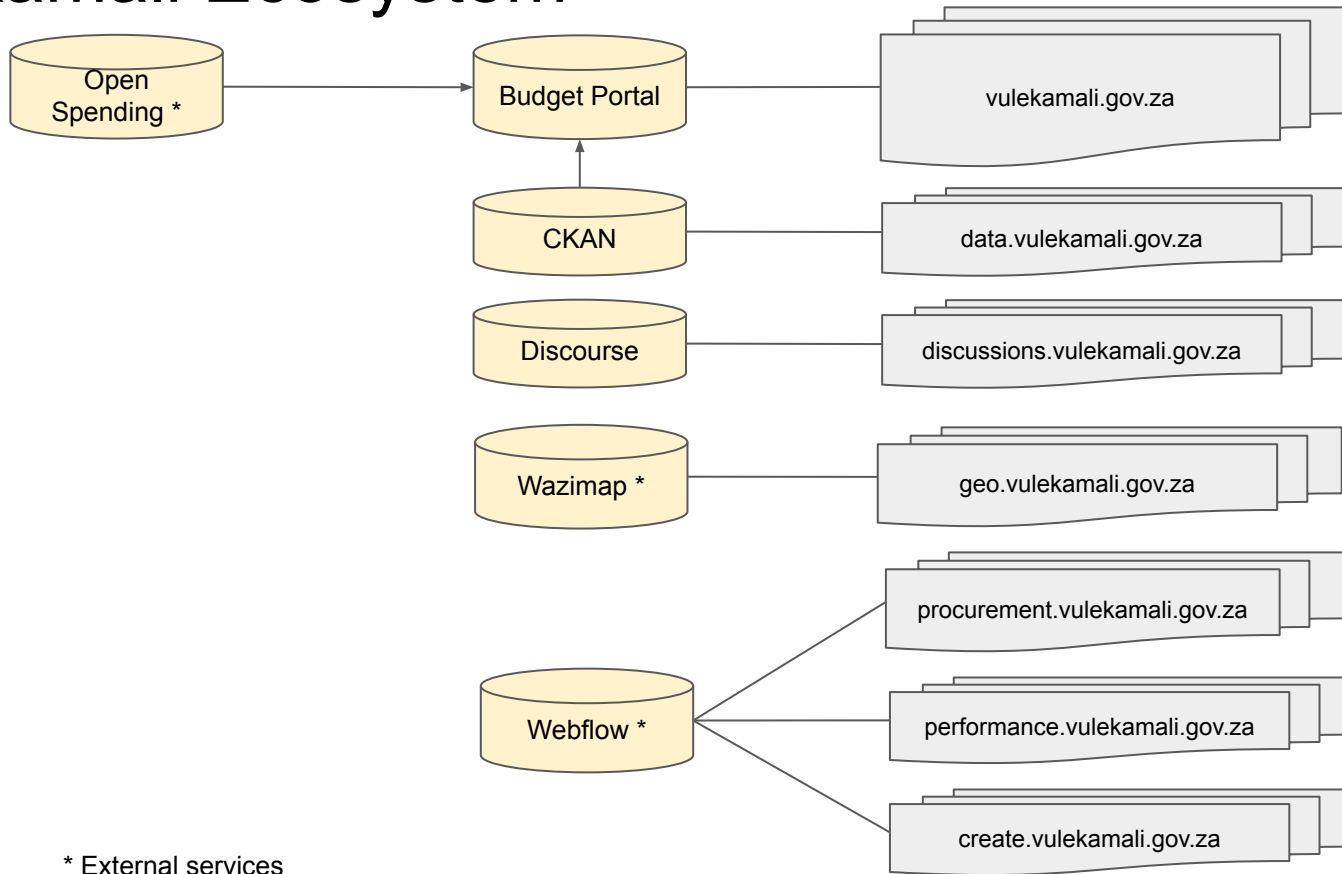


All kinds of things on this
“data portal”

What's actually on this "Data portal"

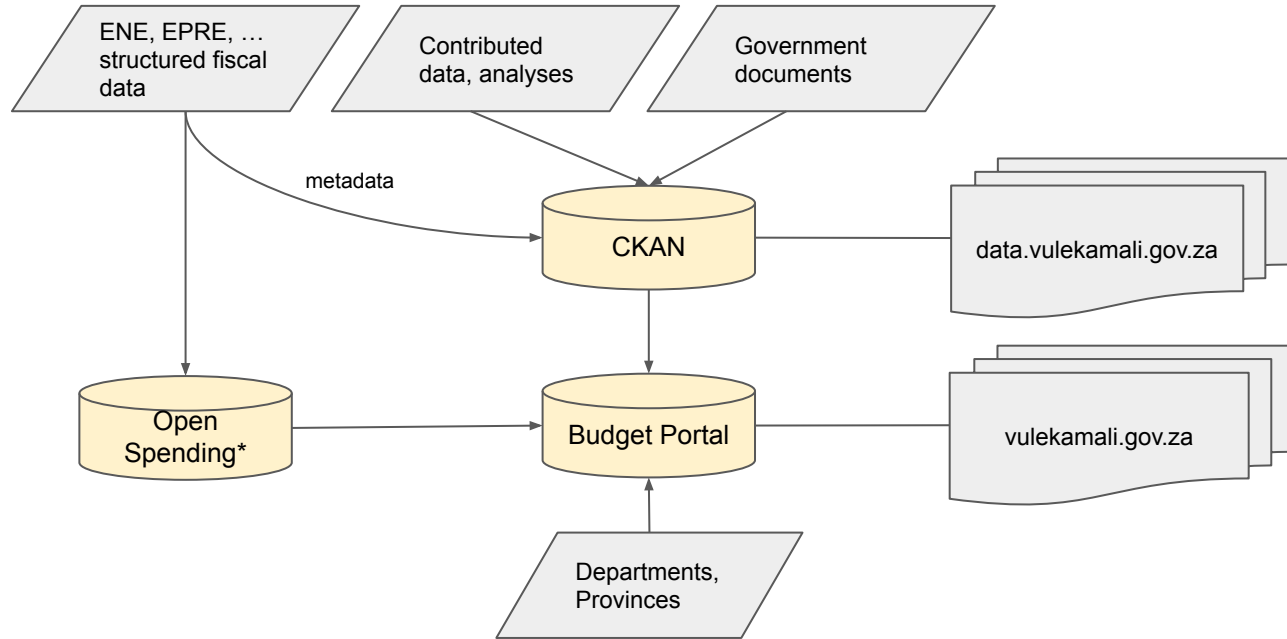
What	How many	Format
Department metadata	~40 national /year ~120 provincial /year	Django models
Department budget narrative doc	2 per dept * 160 per year	PDF Excel for humans
Sphere budget dataset	National and Provincial * 3 per year	Excel for humans CSV API (OLAP cube)
Other tabular datasets	2-3 per year	Excel CSV API (Postgres over HTTP)
Data on another govt site	1-4 files per year * ~3	Table in PDF
Contributed data or analysis		PDF, CSV, Stata, Link to your cool viz

vulekamali Ecosystem



<https://maintenance.vulekamali.gov.za/design/architecture>

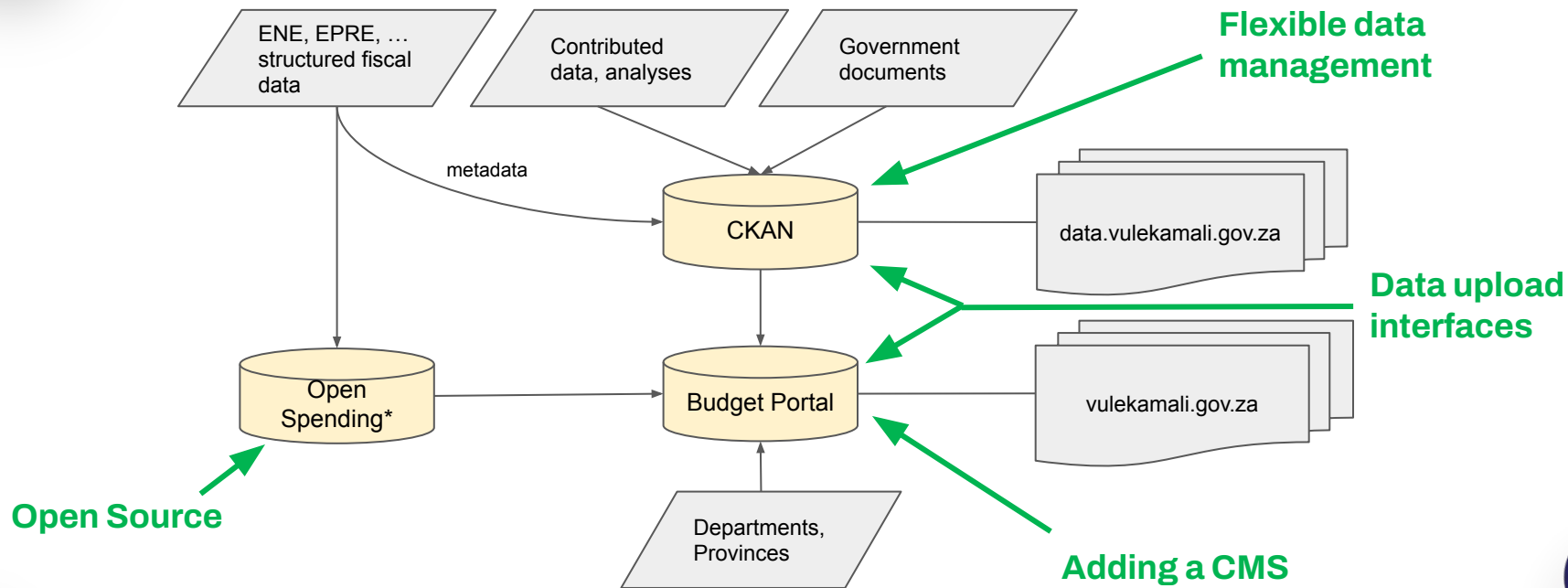
vulekamali Data Flow



* External services

<https://maintenance.vulekamali.gov.za/design/architecture>

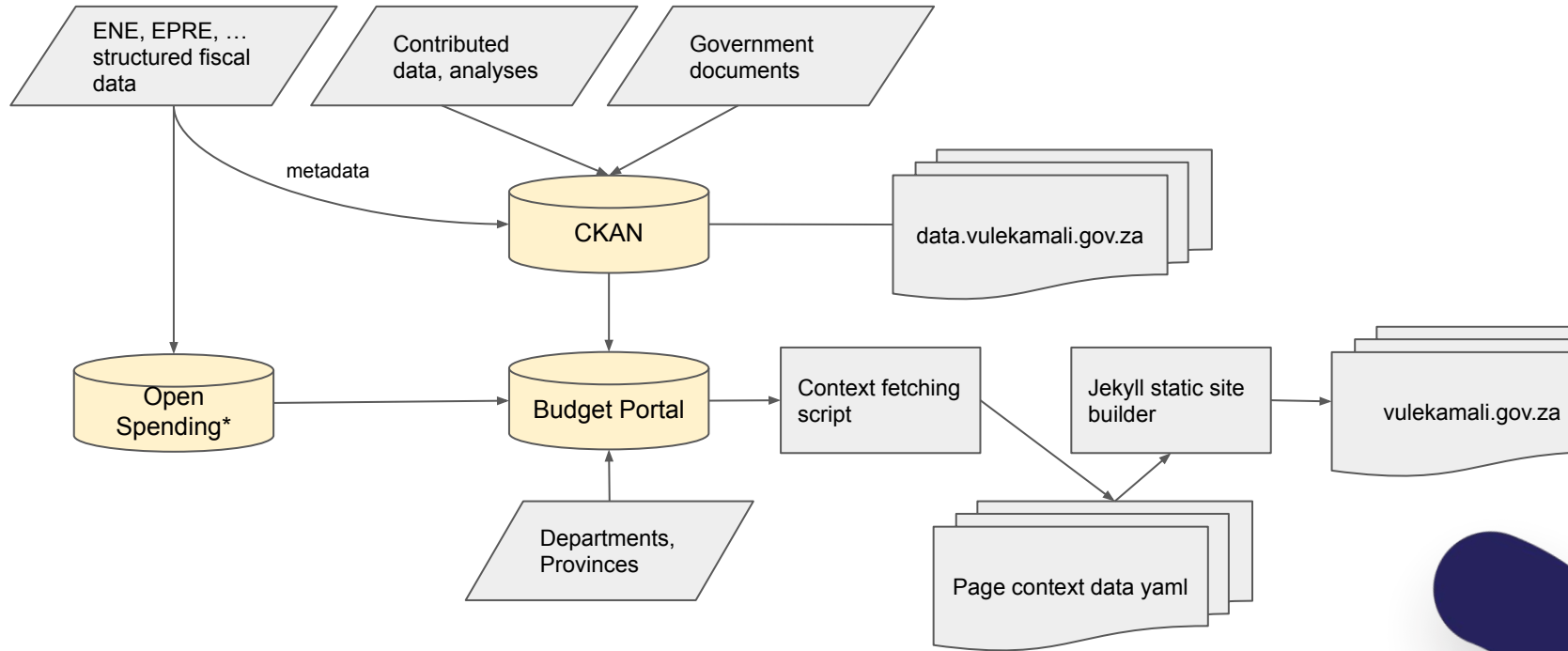
The stories we have to share



* External services

<https://maintenance.vulekamali.gov.za/design/architecture>

Architecture 1: Static site (Jekyll)

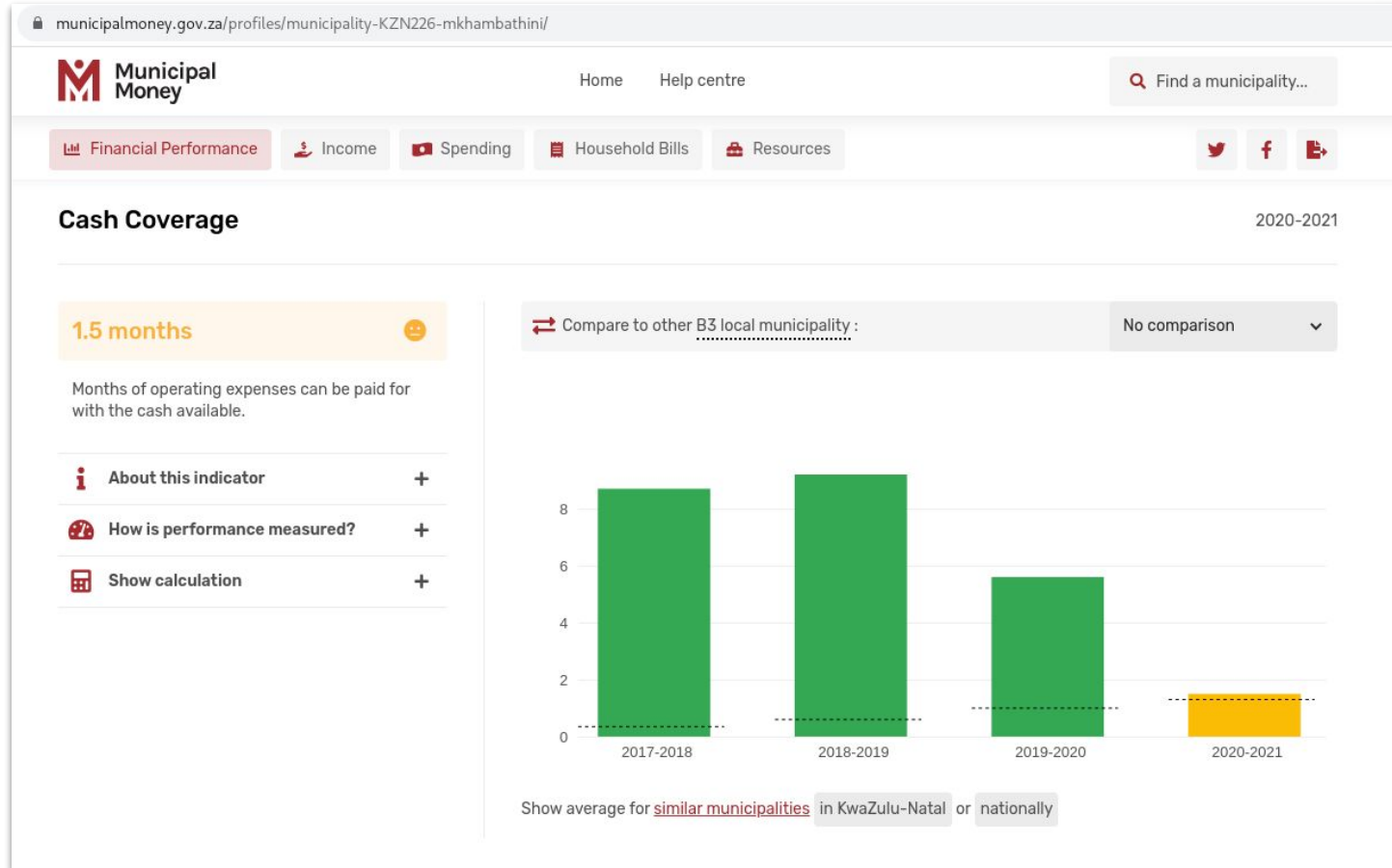


Architecture 1: Static site (Jekyll)

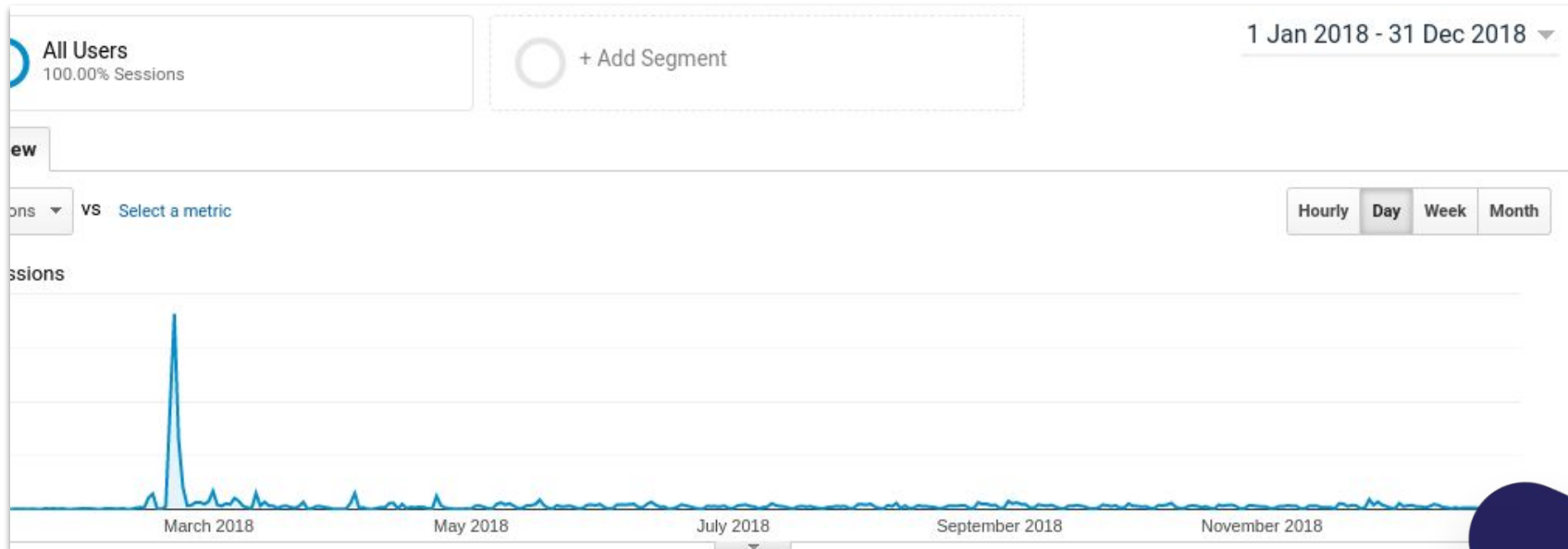
```
555 government:
556   name: South Africa
557   slug: south-africa
558   government_functions: []
559   intro: "## Vote purpose \n\nContribute to a just, peaceful and safer South Africa\
560   \ through the effective and humane incarceration of inmates and the rehabilitation\
561   \ and social reintegration of offenders.\n\n## Vote mandate\n\nThe mandate of the\
562   \ Department of Correctional Services is derived from the Correctional Services\
563   \ Act (1998), the Criminal Procedure Act (1977), the 2005 White Paper on Corrections,\
564   \ and the 2014 White Paper on Remand Detention Management in South Africa. The legislation\
565   \ requires the department to contribute to maintaining and promoting a just, peaceful\
566   \ and safe society by correcting offending behaviour in a safe, secure and humane\
567   \ environment, which allows for optimal rehabilitation and reduced repeat offending."
568   is_vote_primary: true
569   name: Correctional Services
570   programme_by_economic_classification:
571     dataset_detail_page: /datasets/estimates-of-national-expenditure/estimates-of-national-expenditure-2019-20
572     department_data_csv: https://datamanager.vulekamali.gov.za/csv/?api_url=https%3A//openspending.org/api/3/cubes/b9d2af843f3a7ca223eea07fb608e62a%3Aestimates-of
573     econ_classes:
574     - items:
575       - name: Incarceration
576         total_budget: 568371000
577         type: programme
578       - name: Administration
579         total_budget: 47619000
580         type: programme
581       - name: Rehabilitation
582         total_budget: 4970000
583         type: programme
584       - name: Social Reintegration
585         total_budget: 1716000
586         type: programme
587       - name: Care
588         total_budget: 133000
589         type: programme
590     name: Capital - Payments for capital assets
591     type: economic_classification_1_and_2
592     - items:
```

```
5 5 description: Department budgets for the 2016-17 financial year from National Treasury
6 6 in partnership with IMALI YETHU.
7 7 financial_years:
8 - - closest_match:
9 - is_exact_match: true
10 - url_path: /2015-16/departments
11 - id: 2015-16
12 - is_selected: false
13 8 - closest_match:
14 9 is_exact_match: true
15 10 url_path: /2016-17/departments
16 @@ -25,208 +20,213 @@ financial_years:
17 25 20 url_path: /2018-19/departments
18 26 21 id: 2018-19
19 27 22 is_selected: false
20 + - closest_match:
21 + is_exact_match: true
22 + url_path: /2019-20/departments
23 + id: 2019-20
24 + is_selected: false
```

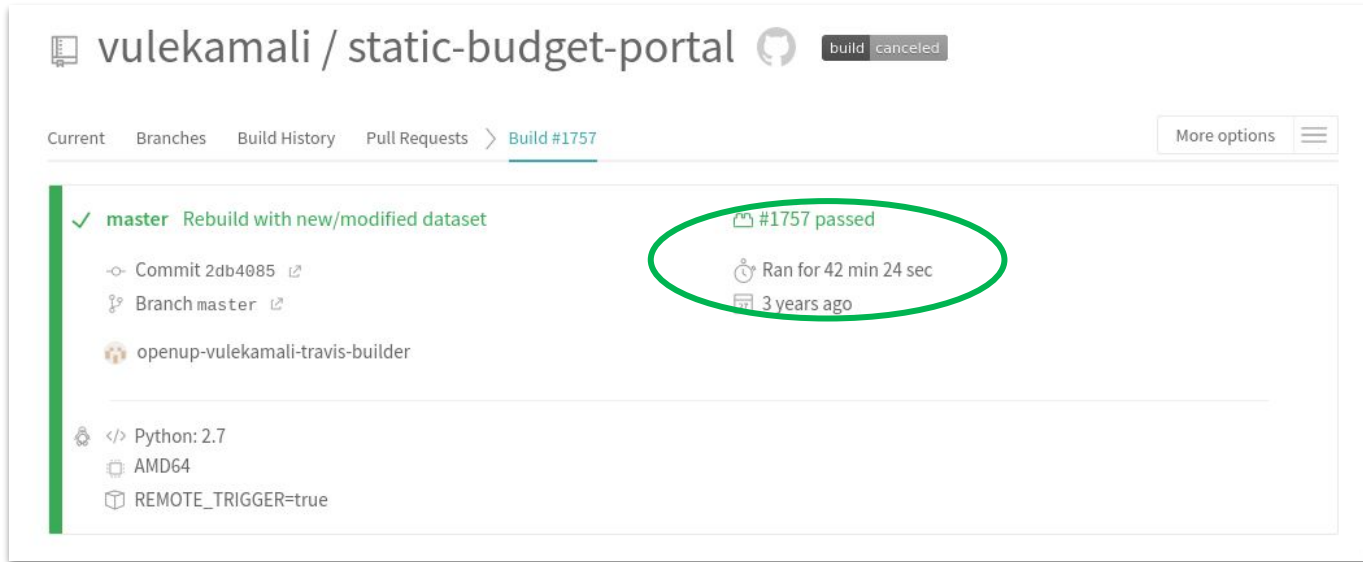
Pre-calculated for comparison




Static frontend: Reliable, performant





Static frontend: 40 minute build time





vulekamali / static-budget-portal  build canceled


Current Branches Build History Pull Requests > [Build #1757](#) More options


✓ **master** Rebuild with new/modified dataset  #1757 passed


↳ Commit 2db4085 


↳ Branch master 


 openup-vulekamali-travis-builder

 Python: 2.7

 AMD64

 REMOTE_TRIGGER=true

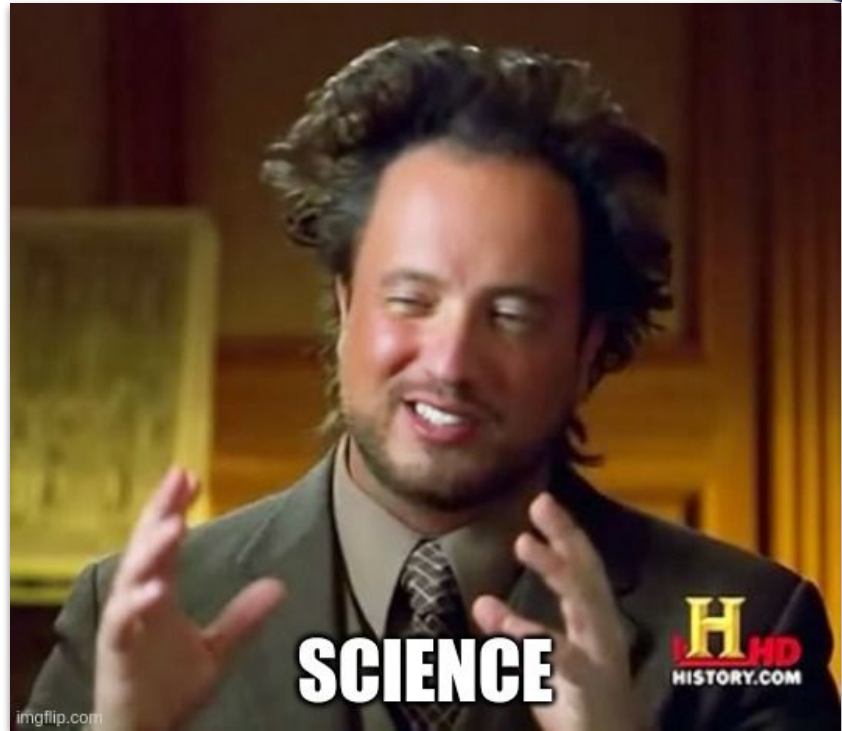
 Ran for 42 min 24 sec

 3 years ago

- ~20 minutes fetching all site data from API
- ~20 minutes building Jekyll site
- Incremental rebuild vs basic caching in Django?
- Todo: explore Incremental Static Regeneration in e.g. Next.js

Caching is science


Don't be afraid



Other challenges

- Keeping up to date
- Gaps in the data
- Inconsistencies in the data
- Data formatted incorrectly
- Helpful feedback to admins
- ...
- Tech was the easy part
- Still fun

Updates through the year

 vulekamali Maintenance Manual

Q Search...

Home

1. OPERATIONS: DATA EVENTS

[February: Adding a new national budget](#) >

[March: Division of Revenue Act is gazetted](#)

[April: Adding a new provincial budget](#)

[September: Audit Outcomes](#)

[October: Adding a national adjustment budget/MTBPS](#) >

[November: Adding provincial adjustment budgets](#)

[Quarterly Infrastructure Project updates](#)

[Quarterly in-year spending data updates](#)

[Annual procurement data updates](#)

[Annual PPP Infrastructure Project updates](#)

Stage 4 draft features

2. OPERATIONS: ACTIONS

February: Adding a new national budget

How to add a new national budget when it is tabled in February in advance of a new financial year

Steps

When the budget speech starts, and again when the data is available on vulekamali, [the homepage notices need to be updated](#).


The following is required to add a new national budget to vulekamali


Immediately upload key budget documents

1. [Upload the Division of Revenue bill resources](#)
2. [Upload the key budget documents](#)

Structured data for updated charts and department pages

1. The [new financial year, sphere, government, and departments must be added to the main site Admin](#)
2. The ENE Vote e-publications and accompanying per-vote Excel files must be added to the CKAN to show up on department pages
 - Follow the [bulk-uploading procedure](#) to upload the documents, and
 - see the [section for specifics on ENE conventions](#) to ensure you upload them correctly

 Export as PDF

 Copy link

☰ ON THIS PAGE

Steps

- Immediately upload key budget docu...
- Structured data for updated charts a...
- Publish the new financial year
- Dataset checklist

New national budget

Uploads

- ~40 departments' name, description
- Each department's
 - narrative PDF
 - accompanying XLSX
- Budget dataset XLSX, CSV, API import
- ~10 other PDFs and excel files
- ~3 more CSV imports for APIs

Setting up a new year's government

← → ↻ 🏠 <https://datamanager.vulekamali.gov.za/admin/>

Django administration

Site administration

- ACCOUNTS
 - Email addresses
- AUTHENTICATION AND AUTHORIZATION
 - Users
- BUDGETPORTAL
 - Departments [+ Add](#) [🔧 Change](#)
 - Financial years [+ Add](#) [🔧 Change](#)
 - Governments [+ Add](#) [🔧 Change](#)
 - Govt functions [+ Add](#) [🔧 Change](#)
 - Programmes [+ Add](#) [🔧 Change](#)
 - Spheres [+ Add](#) [🔧 Change](#)

Home › Budgetportal › Spheres › <Sphere /2018-19/national>

Change sphere

Name:

Financial year: [🔧](#) [+](#)

Slug:

[Delete](#)

Home › Budgetportal › Governments

Select government to change

Action: [Go](#) 0 of 40 selected

- GOVERNMENT
- <Government /2018-19/provincial/western-cape>
- <Government /2018-19/provincial/north-west>
- <Government /2018-19/provincial/northern-cape>
- <Government /2018-19/provincial/mpumalanga>
- <Government /2018-19/provincial/limpopo>
- <Government /2018-19/provincial/kwazulu-natal>
- <Government /2018-19/provincial/gauteng>
- <Government /2018-19/provincial/free-state>
- <Government /2018-19/provincial/eastern-cape>
- <Government /2018-19/national>

Bulk importing departments django-import-export FTW!

import

This importer will import the following fields: department_name, government, vote_number, is_vote_p

File to import: No file selected.

Format:

Sphere:

Some rows failed to validate

Please correct these errors in your data where possible, then reupload it using the form above.

ROW	ERRORS	DEPARTMENT_NAME	GOVERNMENT	VOTE_NUMBER	IS_VOTE_PRIMARY	INTRO
1	NON FIELD SPECIFIC Government 'Western Cape' does not exist in sphere '<Sphere /2019-20/national>'. 1	Western Cape	New Dep	1	false	## Vote purpose mandate and the oversight, mobilisation and support... the president and the deputy president in the execution of their responsibilities, as outlined in the Constitution and the programme of government.
2				2		## Vote purpose _Facilitate a common programme towards the achievement of the electoral mandate and the enhanced integrity of the state through considered planning, coordination, oversight, mobilisation and support... ## Mandate The mandate of the Presidency is to support the president and the deputy president in the execution of their responsibilities, as outlined in the Constitution and the programme of government.
3	1	western-Cape	true-true	2	3	## Vote purpose _Facilitate a common programme towards the achievement of the electoral mandate and the enhanced integrity of the state through considered planning, coordination,

Import

Below is a preview of data to be imported. If you are satisfied with the results, click 'Confirm import'

Preview

	DEPARTMENT_NAME	GOVERNMENT	VOTE_NUMBER	IS_VOTE_PRIMARY	INTRO
New	The Presidency	South Africa	1	True	## Vote purpose Facilitate a common programme towards the achievement of the electoral mandate and the enhanced integrity of the state through considered planning, coordination, oversight, mobilisation and support... ## Mandate To serve the president in the execution of his responsibilities and duties, support the president, as articulated in chapter 5 of the Constitution.
New	Parliament	South Africa	2	True	## Vote purpose Provide the support services required by Parliament to fulfil its constitutional responsibilities and to ensure the effective functioning of the political parties represented in Parliament to secure administrative support a

Bulk importing department PDFs, XLSXs

The image shows a screenshot of the vulekamali Datastore website. The main navigation bar includes 'vulekamali Datastore', 'Datasets', 'Organizations', 'Groups', 'About', and a search bar. A 'Log in' button is located in the top right corner.

The 'Datasets' page shows a search for '161 datasets found' with filters for 'Budget Vote Documents' and '2022-23'. A list of datasets is displayed, including 'ENE 2022-23 - Vote 33 - Human Settlements', 'ENE 2022-23 - Vote 28 - Police', 'ENE 2022-23 - Vote 41 - Water and Sanitation', and 'Limpopo EPRE 2022-23 - Vote 12 - Social Development'. Each dataset entry includes a 'PDF' and 'XLSX' icon.

The detailed view for 'ENE 2022-23 - Vote 33 - Human Settlements' shows the following information:

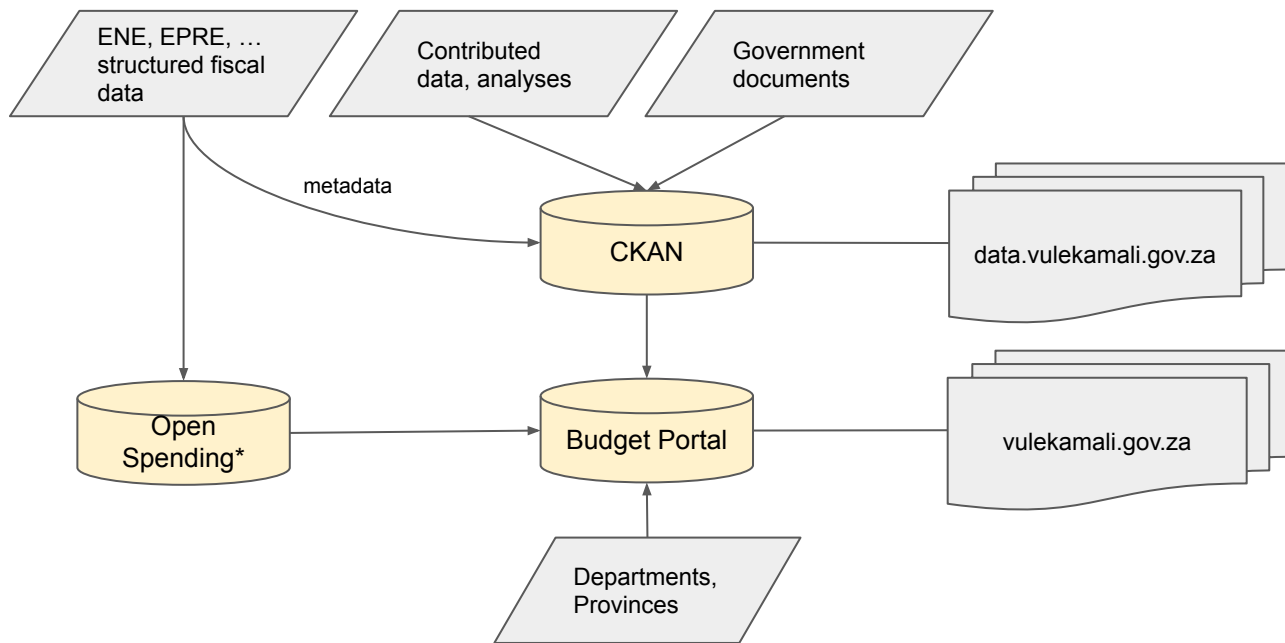
- Financial Year:** 2022-23
- Sphere:** national
- Followers:** 0
- Organization:** national treasury (Department: National Treasury, REPUBLIC OF SOUTH AFRICA)
- Social:** Google+, Twitter, Facebook

The 'Data and Resources' section lists three PDF and XLSX files, each with an 'Explore' button. The 'Additional Info' table provides the following details:

Field	Value
Financial Year	2022-23
Sphere	national
Last Updated	September 13, 2022, 8:54 AM (UTC+02:00)
Created	February 25, 2022, 3:12 PM (UTC+02:00)
Department Name	Human Settlements
Vote Number	33
department_name	Human Settlements
department_name_slug	human-settlements
geographic_region_slug	south-africa

<https://data.vulekamali.gov.za/>

Remember Budget Portal pulls department data



Bulk importing department PDFs, XLSXs ...to link to in context

The image shows a web application interface for budget data and a Microsoft Word document. The web application displays spending plans by programme and sub-programme for the financial year 2022-23. The total budget for all programmes is R33,024,716,006. The main programme, 'Integrated Human Settlements Planning and Development', has a budget of R22 billion. Other sub-programmes include 'Informal Settlements' (R9 billion), 'Grant Management' (R9 billion), 'Rental and Social', and 'Affordable'. The Microsoft Word document, titled 'Microsoft Word - 2022 ENE Vote 33.docx', shows the content of 'Programme 2: Integrated Human Settlements Planning and Development'. The document includes a programme purpose, objectives, and subprogrammes. A green arrow points from the PDF link in the web application to the document content.

Source: [Estimates of National Expenditure 2022-23](#)

[Download this data for analysis \(CSV\)](#)

[Dataset Guide for Estimates of National Expenditure](#)

[Learn more about these programmes in the Estimates of National Expenditure as PDF](#)

[Learn more about these programmes in the Estimates of National Expenditure as Excel](#)

PROGRAMME	SUB-PROGRAMME
All programmes R33,024,716,006	None selected R0
Integrated Human Settlements Planning and Development R22 billion	Informal Settlements R9 billion
Grant Management R9 billion	Rental and Social
	Affordable

Budget (Main appropriation) 2022-23

Programme 2: Integrated Human Settlements Planning and Development

Programme purpose

Manage the development of policy, planning and research in the creation of sustainable settlements, oversee the delivery of the integrated residential development programme through intergovernmental partnerships with stakeholders.

Objectives

- Accelerate the development and delivery of spatially integrated housing and human settlements and the *urban settlements development grant* to metropolitan municipalities Division of Revenue Act
 - transferring and monitoring the disbursement of the *human settlements development grant* to metropolitan municipalities
 - undertaking research and developing housing and human settlements policies when required.
- Promote the coordination of planning and strengthen intergovernmental cooperation in different spheres of government by:
 - providing support to provinces and municipalities in the development of the remaining implementation plans by 2023/24
 - facilitating intergovernmental forums and stakeholder partnerships on an ongoing basis.

Subprogrammes

- Management for Integrated Human Settlements Planning and Development* provides the programme.
- Macro Sector Planning* manages the development and evaluation of macro strategy for human settlements.

Bulk importing department PDFs, XLSXs

	A	D	C	D	C	F	G	
1	government	group_id	department_name	dataset_name	dataset_title	resource_name	resource_format	resource
2	South Africa	adjusted-budget-vote-do	Public Service and Adm	AENE 2017-18 - Vote 10 - Public Serv	AENE 2017-18 - Vote 10 - Public	AENE 2017-18 - Vote 10 - Public Servic	PDF	http://v
3	South Africa	adjusted-budget-vote-do	The Presidency	AENE 2017-18 - Vote 1 - The Preside	AENE 2017-18 - Vote 1 - The Pres	AENE 2017-18 - Vote 1 - The Preside	XLS	http://v
4	South Africa	adjusted-budget-vote-do	Parliament	AENE 2017-18 - Vote 2 - Parliament	AENE 2017-18 - Vote 2 - Parliam	AENE 2017-18 - Vote 2 - Parliament	XLS	http://v

Django administration

Home

Bulk Upload

Download metadata xlsx template

Task queue length: 0 items.

Sphere: <Sphere /2017-18/national>

File: No file selected.

	government	department	group	dataset_name	dataset_title	resource_title
1	South Africa	Public Service and Administration	adjusted-budget-vote-documents	aene-2017-18-vote-10-public-service-and-administration	AENE 2017-18 - Vote 10 - Public Service and Administration	AENE 2017-18 - Administration
2	South Africa	The Presidency	adjusted-budget-vote-documents	aene-2017-18-vote-1-the-presidency	AENE 2017-18 - Vote 1 - The Presidency	AENE 2017-18 -
3	South Africa	Parliament	adjusted-budget-vote-documents	aene-2017-18-vote-2-parliament	AENE 2017-18 - Vote 2 - Parliament	AENE 2017-18 -
4	South Africa	Communications TYPO	adjusted-budget-vote-documents	aene-2017-18-vote-3-communications	AENE 2017-18 - Vote 3 - Communications	AENE 2017-18 -

Department not found for specified government

South Africa Cooperative Governance and Traditional Affairs

adjusted-budget-vote-documents aene-2017-18-vote-4-cooperative-governance-and-traditional-affairs

AENE 2017-18 - Vote 4 - Cooperative Governance and Traditional Affairs

AENE 2017-18 - Governance and

Django Q with ORM broker

Django administration

Home › Django Q › Failed tasks

Select Failed task to change

Q Search

Action: Go 0 of 38 selected

<input type="checkbox"/>	NAME	FUNC	STARTED	STOPPED	RESULT
<input type="checkbox"/>	carpet-hamper-table-pizza	<function create_resource at 0x7f6970db2b18>	Oct. 25, 2018, 3:22 p.m.	Oct. 25, 2018, 3:26 p.m.	'NoneType' object has no attribute 'get_resource'
<input type="checkbox"/>	salami-carolina-pizza-berlin	<function create_resource at 0x7f6970db2b18>	Oct. 25, 2018, 3:22 p.m.	Oct. 25, 2018, 3:26 p.m.	'NoneType' object has no attribute 'get_resource'
<input type="checkbox"/>	stream-lake-yellow-angel	<function create_resource at 0x7f6970db2b18>	Oct. 25, 2018, 3:22 p.m.	Oct. 25, 2018, 3:26 p.m.	'NoneType' object has no attribute 'get_resource'

DJANGO Q

[Failed tasks](#)  [Change](#)

[Queued tasks](#)  [Change](#)

[Scheduled tasks](#) [+ Add](#)  [Change](#)

[Successful tasks](#)  [Change](#)

By group

All

Bulk upload interfaces

Uploading many “things”

- Preview pending changes
- Handle partial success
- Support retrying
- Support corrections
- Until everything is alright
- Idempotence
 - Don't do bad stuff if repeated
 - Maybe concurrently

Interactive validation isn't pretty

A	D	C	
government	group_id	department_name	dataset_name
2 South Africa	adjusted-budget-vote-d	Public Service and Adm	AENE 2017-18
3 South Africa	adjusted-budget-vote-d	The Presidency	AENE 2017-18
4 South Africa	adjusted-budget-vote-d	Parliament	AENE 2017-18
5 South Africa	adjusted		
6 South Africa	adjusted		
7 South Africa	adjusted		
8 South Africa	adjusted		
9 South Africa	adjusted		
0 South Africa	adjusted		
1 South Africa	adjusted		
2 South Africa	adjusted		
3 South Africa	adjusted		
4 South Africa	adjusted		
5 South Africa	adjusted		
6 South Africa	adjusted		
7 South Africa	adjusted		
8 South Africa	adjusted		
9 South Africa	adjusted		
0 South Africa	adjusted		
1 South Africa	adjusted		
2 South Africa	adjusted		
3 South Africa	adjusted		
4 South Africa	adjusted		

Django administration

Home

Bulk Upload

Download metadata xlsx template


Task queue length: 0 items.

Sphere: <Sphere /2017-18/national>

File: No file selected.

government	department	group
South Africa	Public Service and Administration	adjusted-budget-vote-d
South Africa	The Presidency	adjusted-budget-vote-d
South Africa	Parliament	adjusted-budget-vote-d
South Africa	Communications TYPO	adjusted-budget-vote-d
South Africa	Cooperative Governance and Traditional Affairs	Department

```
        "message": "This dataset already exists",
    }
}
else:
    try:
        # Dataset by dataset name
        dataset = Dataset.fetch(dataset_name)
    except PackageDeletedException:
        return (
            None,
            {
                "name": dataset_name,
                "title": dataset_title,
                "status": "error",
                "message": (
                    "A dataset with this name exists but is deleted. "
                    "First purge it or change its state to active or "
                    "change its name"
                ),
            },
        )
    if dataset:
        dataset_preview = {
            "object": dataset,
            "name": dataset.slug,
            "title": dataset.name,
            "new_title": dataset_title,
            "status": "error",
            "message": (
                "Dataset by this name exists but it "
                "is not configured correctly to be "
                "identified as part of this dataset."
            ),
        },
    else:
        dataset_preview = {
            "name": dataset_name,
            "title": dataset_title,
            "status": "info",
            "message": "This dataset will be created.",
            "action": "create",
        }
    else:
        dataset_preview = {
            "name": dataset_name,
            "title": dataset_title,
            "status": "error",
            "message": (
                "Department not found. We can't "
```



Pages error when data is missing...
or mis-classified...
or broken!

Uploading fiscal data (government financial data)

openspending-dedicated.vulekamali.gov.za/packager/provide-data

OS Packager

Fiscal Data Packager

1 2 3 4

Provide your data

Provide a CSV file containing fiscal data

Upload a file No file selected

Waiting for file or URL...

Need help? Check out the guides on our community site

OpenSpending
Open Knowledge Foundation

Column Mapping

Value: consolidated-2022-23 / Value	functional-classification: consolidated-2022-23 / Function group	unknown: consolidated-2022-23 / Budget group	economic-classification: consolidated-2022-23 / Econ2 consolidated-2022-23 / Econ3
---	--	--	--

date:
consolidated-2022-23 / Financial year

Save this Data Package

Publishing status:

datapackage.json - Failed

```
fiscal.helpers.save_primarykey
Traceback (most recent call last):
  File "/usr/local/lib/python3.6/site-packages/datapackage_pipelines_fiscal/processors/helpers/save_primarykey.py", line 9, in process(modify_datapackage=modify_datapackage)
    process(modify_datapackage=modify_datapackage)
  File "/usr/local/lib/python3.6/site-packages/datapackage_pipelines/wrapper/wrapper.py", line 223, in process
    ctx.datapackage = modify_datapackage(ctx.datapackage, ctx.parameters, ctx.stats)
  File "/usr/local/lib/python3.6/site-packages/datapackage_pipelines_fiscal/processors/helpers/save_primarykey.py", line 5, in dp['savedPk'] = dp['resources'][0]['schema']['primaryKey']
KeyError: 'primaryKey'
```

consolidated-2022-23.csv - Ready 100%

year

2021
2021
2020

Title

year

DataType

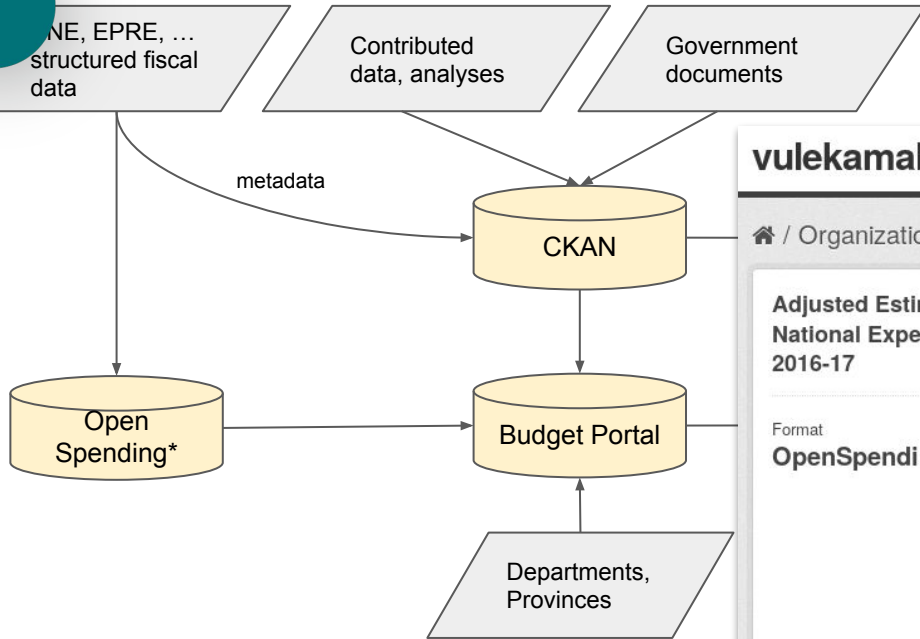
Date (date) >

Fiscal year

The fiscal-year for which the values in this record are relevant

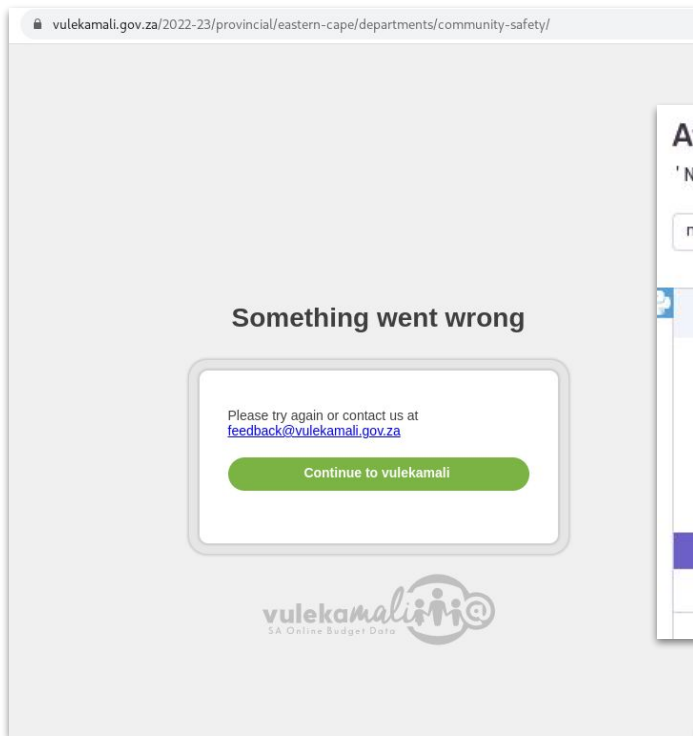
Upload a schema file No file selected

Telling budget portal about OpenSpending data



The screenshot shows the 'vulekamali Datastore' interface. The breadcrumb trail is: / Organizations / National Treasury / Adjusted Estimates of ... / Adjusted Estimates of ... / Edit. The resource title is 'Adjusted Estimates of National Expenditure 2016-17'. The format is 'OpenSpending API'. The URL is 'https://openspending.org/api/3/cubes/b9d2af843f3a7ca223eea071'. The name is 'Adjusted Estimates of National Expenditure 2016-17'. The description is 'Some useful notes about the data'. The format dropdown is set to 'OpenSpending API'. There are buttons for 'Delete' and 'Update Resource'.

Missing data errors



AttributeError

'NoneType' object has no attribute 'get_openspending_api'

mechanism django handled false

budgetportal/summaries.py in get_openspending_api at line 444

```
439.  
440.     def get_dataset(self):  
441.         raise Exception("Not implemented")  
442.  
443.     def get_openspending_api(self):  
444.         return self.get_dataset().get_openspending_api()
```

[Link your stack trace to your source code.](#)

```
445.
```

Context...

- Code for the happy path
 - Many possible errors
 - Focus on those that actually occur
 - Might scrap feature
- Originally a static site
 - All page data fetched at once
- Initially maintained by devs
 - We can read stack traces
 - Missing data “a bug”, fixed immediately
- Handover delayed beyond dev contract

“Let it crash”

From Erlang

- Code for the happy path
 - Many possible errors
 - Focus on those that actually occur
- Let errors show themselves
- If you catch, **log the error**

Getting data for a chart:

1. **Get dataset from CKAN** for that type, year, sphere, department
2. **Get resource with type** “OpenSpending API” from dataset
3. **Generate query URL** for this summary to OpenSpending API
4. **Fetch data**
5. **Transform, calculate** on data in python
6. **Generate CSV download URL** for most granular form of this slice
7. **Return data structure** for chart, related links

7 chart sections

I'm scared of/allergic to defensive programming (however it's time to refactor)

Feedback for admins:
 “Why isn’t this showing?”
 “Why is this an error?”

Help admins fix
 VS
 Help admins enter correctly

A	B	C	K	L	M	20
Usual month	Budget event	Item	2019-20	2020-21	2021-22	20
February	Main budget tabled	Main budget documents	Green			
		Per-vote ENE PDFs	Green			
		Per-vote ENE XLSXs	Green			
		CPI Inflation structured data	Green			
		ENE structured fiscal data	Green			
		ENE added to Budget vs Actual data	Green	Yellow		
		Consolidated budget structured fiscal data	Green			
March	Division of Revenue Act is gazetted	National Infrastructure Projects	Green			
		Division of revenue Act PDF	Green			
April	Provincial budgets tabled	Division of revenue Act Excel	Green			
		Conditional Grant Frameworks	Green	Yellow		
		Estimates of Provincial Revenue and Expenditure Excel	Green			
		Provincial expenditure budget added to Budget vs Actual	Green	Yellow		
September	National audit outcomes released	Per-vote EPRE PDFs	Green			
		Per-vote EPRE XLSXs (Never uploaded excel files on the treasury website)	Red			
		National audit outcomes added to Budget vs Actual dataset	Green	Yellow		
October	MTBPS	Provincial audit outcomes released	Red			
		National MTBPS documents	Green			
		Per-vote AENE PDFs	Green			
		Per-vote AENE XLSXs	Green			
		AENE structured fiscal data	Green			
November	Provincial adjusted budgets tabled	AENE data added to Budget vs Actual dataset	Green			
		Per-vote AEPRE PDFs	Green			
Quarter 1		IRM update	Green	Red		
Quarter 2		IRM update	Green	Red		
Quarter 3		IRM update	Green	Red		
Quarter 4		IRM update	Green	Red		
Quarter 1		National IYM Update	Green			

Exception catch-all is tempting...

Feedback for dev troubleshooting

- `views.department(request, financial_year_id, sphere_slug, government_slug, department_slug)`
 - `department.get_adjusted_budget_summary()`
 - `self.get_adjusted_estimates_expenditure_dataset()`
 - `ckan.action.package_search(**query)`
 - HTTP GET `data.vulekamali.gov.za/api`
 - `openspending_api.aggregate(cuts, drilldowns, order)`
 - HTTP GET `openspending-dedicated.vulekamali.gov.za/api`

Log caught exceptions incl. stack trace!

What could possibly go wrong?

When data has been uploaded

- OpenSpending is down
- OpenSpending dataset URL is wrong
- Metadata in CKAN is wrong
- CSV is not UTF-8, Excel hates you
- Wrong value capitalisation
-
- ...Two years later...
-
- “Required” dataset delayed by months
- Column suddenly contains integers
 - `value.strip()`
- Comma used as decimal separator
 - Stripped: millions -> billions

Admins should be able to

- Upload without fear
- Understand most issues
- Try and try again
- Rapidly get feedback
- Understand issue scope

CKAN, OpenSpending, Django Admin,
Django Q

Generalised tools enabled
rapid iteration

Many disparate interfaces
are hard to use

Consolidation is important

The awkward middle ground data

Medium amounts of data is more painful

Lots

Millions of rows+

Via API

Strict validation

Medium

Tens-thousands

Via ...Excel

Human feedback

Little

A handful

Via a form/bot

Only valid options

The way forward

I think...

- **Upload wizards**
 - Only valid options for classification
 - Add and Replace taken care of
- **Background tasks**
 - Where needed
 - Status
 - Notification
- **Validation reports**
 - Saved to “Uploads”
 - ***Really*** good feedback

Humans are creative

FunctionGroup1		
FunctionGroup2		
FinancialYear	Integer, e.g. 2018 for the year 2018-19	
BudgetPhase	Audited Outcome, Adjusted appropriation, Main appropriation,	
AmountKind	value-kind:code	A type like Total or Adjustments - Roll-overs
Value	value - Rands, not thousands of rands	

Humans are creative.

No amount of **documentation**
will result in **clean data**.

Communicating content of/checking 40k rows

Pivot tables. Learn them.

	E	F	G	H	I	J	K	L
1	EconomicClassification3	EconomicClassification4	EconomicClassification5	AmountKind	FinancialYear	Programme	ProgNumber	Value
2	Machinery and equipment	Other machinery and equipment	Other machinery and equipment	Adjustments - Total adjustments	2019	Administration	1	169000
3	Machinery and equipment	Other machinery and equipment	Other machinery and equipment	Adjustments - Virements and shifts due to savings	2019	Administration	1	169000
4	Machinery and equipment	Other machinery and equipment	Other machinery and equipment	Total	2019	Administration	1	1126000

→ maintenance.vulekamali.gov.za/operations-actions/adding-modifying-information-on-the-site/adding-structured-fiscal-data-to-openspending

vulekamali Maintenance Manual

Q Search...

Bank uploading department specific documents

Adding structured fiscal data

In-year spending data

Uploading Conditional Grant Framework documents

Updating procurement spend analysis data

Adding a new Division of Revenue bill

Editing the menu items

Contributed Data

Adding Admin users

Example pivot table with the following parameters:

- **Filter:** none
- **Columns:** Budget Phase; Amount Kind
- **Rows:** Department
- **Values:** Amount (sum)

Sum - Value	A	B	C	D	E	F	G	H	I	J	K	L	M
	Data	BudgetPhase											
	Adjusted appropriation						Adjustments - Significant and unforeseeable economic and financial events	Adjustments - Total adjustments	Adjustments - Virements and shifts due to savings	Special appropriation	Total	Voted (Main appropriation)	Total Result
Department	Adjustments - Announced in the budget speech	Adjustments - Declared unspent funds	Adjustments - Roll-overs	Adjustments - Self-financing	Adjustments - Shifting of functions between votes								
Agriculture, Forestry and Fisheries	-57700000		4900000				-52800000		0		7612089000	7664889000	15171378000
Arts and Culture	-45400000						-45400000		0		4572085000	4617485000	9098770000
Basic Education	-40000000						-40000000		0		24464531000	24504531000	48889062000
Communications	3200000000	-5000000		2000000			3197000000		0		4773091000	1576091000	12743182000
Cooperative Governance And Traditional Affairs	-310500000					-60733000	-371233000		0		90346554000	90717797000	180321875000
Corrections Services	-100000000		8800000	444000			-90756000		0		25316892000	25407638000	50543008000
Defence And Military Veterans	-10000000						375140000		0		50888132000	50512992000	102151404000
Economic Development	-57570000			385140000			-57570000		0		989643000	1045393000	1923536000
Energy	-256464000						-256464000		0		7183557000	7440021000	14110650000



Adding a CMS to existing django project

Adding Wagtail CMS

Content Management System

- Add alongside existing routes
 - Choose routes to take over
- Reuse existing design system
 - Make existing content editable
 - “Stream of custom reusable blocks”
- Rapidly added COVID budget
 - Arbitrary page hierarchy

Existing design system

Editable content

Specific COVID-19 interventions

This section shows some of the specific financial support for needs created or exacerbated by COVID-19.

Non-interest increases in expenditure

The largest main budget increase was allocated towards the COVID-19 relief package, detailed further in the [Supplementary Budget Review](#) page 8. We look at non-interest expenditure to understand what we are spending on other than interest we pay on loans.

This shows:

R21.5 billion is allocated to the Health Function, since the required health budget is larger than planned in February.

Transfers of R 40,9 billion will be made to support vulnerable households for 6 months.

Funding of R 12.5 billion will also be provided through internal reprioritisation (reductions in other areas) in the education sector to fund COVID-19-related spending and catch-up programmes in the basic and higher education and training sectors.

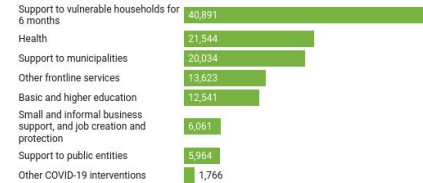
Local government support of R20 billion is provided for, including an increase of R11 billion in the [local government equitable share](#). A number of public entities, including South African National Parks and the Passenger Rail Agency of South Africa, require substantial support to replace revenue lost during the lockdown and prevent large job losses.

Over the next several months, further spending pressures are likely to emerge. For this reason, the unallocated portion of R19.6 billion is set aside as a provisional allocation towards the COVID-19 response.

Main budget non-interest expenditure increases

(R million)

Allocated for COVID-19 fiscal relief package



Other increases

Land Bank equity investment 3,000

Provisional allocation

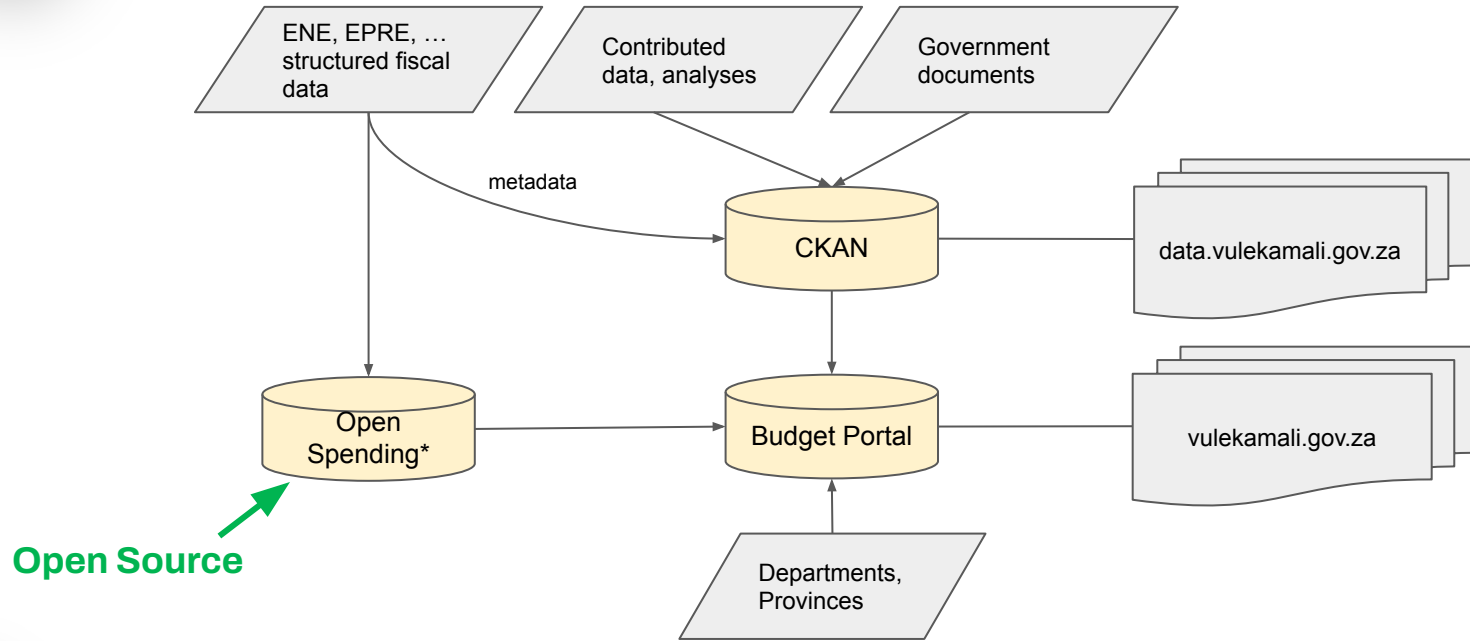
Provisional allocations for COVID-19 fiscal relief package 19,575

Chart: National Treasury of South Africa - Source: 2020 Supplementary Budget review Page 8 Table 2.1 - Get the data - Created with Datawrapper



Open Source
It's really real!

openspending.org replaced by openspending-dedicated.vulekamali.gov.za



Vendor lock-in (or really loss of provider) avoided

In short

Content Management System

- Use (open source) off the shelf tools
- Ship something
 - Anything!!
- Think of the admins
 - Come back and make their lives easier
 - Give excellent feedback
 - Ensure contract allows



openup:

Moving everything towards **open**.

www.openup.org.za

