CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

REQUEST FOR INFORMATION RFI30_2023/24

TO ASSESS PRODUCT AND SOLUTION OFFERINGS AVAILABLE IN THE MARKET TO POSSIBLY SUPPORT THE CITY OF CAPE TOWN'S BUSINESS

Purpose

1. The City of Cape Town (The City) has embarked on a journey of digital transformation with the first goalpost to review its current applications. The aim is to replace outdated technology with fit-for-the-future technology that could sustain The City into the future.

2. The Core Application Refresh (CAR) Programme was approved by the Council as a ten (10) year programme until 2030 for refreshing the ERP, Productivity and GIS technology platforms.

3. The Core Application Refresh (CAR) Programme must enable The City to make sense of its vast volumes of data and information, supporting the objectives of the Integrated Development Plan (IDP) 2022 – 2027 (and beyond) and a key enabler for The City's Data Strategy.

4. The City would like to receive information on technologies and services that can modernise and further enable the data, reporting and analytical capabilities of The City. There is an inherent understanding that this will require an ecosystem of technologies as there is unlikely to be a single application that can service all the needs.

5. Although this Request for Information (RFI) is an open invitation to the Information Technology Industry players, The City encourages the software OEMs (original equipment manufacturers) to respond directly.

Background

6. As a municipality and a local government entity, The City needs to comply with various policies and regulations, for example, Municipal Financial Management Act (MFMA), Preferential Procurement Policy Framework Act (PPPFA), Generally Accepted Municipal Accounting Practice (GAMAP), and Standard Chart of Accounts for Municipalities (mSCOA).

7. The City consists of thirteen (13) directorates of which the majority are responsible for providing services to communities and citizens. These services include for example basic services, water, energy, sanitation, and library services. There are also specific services which citizens need to apply for such as land and property related services, rates clearance, and applications for permits. The City own also provides services relating to emergency incidents.

8. The City employs about twenty-thousand (20 000) employees and an additional ten-thousand (10 000) contract workers via the Expanded Public Works Programme (EPWP).

9. Over the past twenty (20) years, The City has invested in a SAP ERP solution, ESRI Geospatial Information System, and Microsoft productivity offerings. Technical bespoke systems are integrated to the ERP and spatial systems.

10. The Core Application Refresh Programme journey started in 2019 and the first foundational tenders were published in 2021. To date, six (6) tenders were published to the market:
    - Application Programme Interface (API) Gateway (197S/2021/22)
    - Identity Lifecycle Management (176S/2021/22)
    - Productivity software (386S/2021/22)
    - Records Management and Documents Management (41S/2022/23)
    - Human Capital Management (41S/2022/23)

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- IT Service Management (048S/2023/24)

11. Based on the information received, The City may or may not embark on further tender processes.

Request for Information (RFI)

12. This Request for Information (RFI) is not a request for proposal, request for quotation, offer or invitation for bid, nor does The City's issuing this RFI restrict The City in its eventual implementation activities.

13. The responses to the RFI will provide The City with information about products and services currently available in the market to support its required business capabilities and business processes.

14. The City may request additional information from the respondents and may request demonstrations be provided with their response on an electronic device (USB/CD). It is therefore important that respondents provide accurate and honest information in their responses.

15. This RFI forms part of other requests The City has published or will publish with the aim to collect information on multiple products and solutions offerings.

16. The respondents should carefully note that their response to the RFI should include the completion of the published MS Excel Document to address the questions asked in points 23 to 33. The responses to these questions should be provided in both MS Excel and PDF format.

17. The City invites all suppliers of reporting, data and analytics software, solutions and services to respond to the Request for Information.

Timeline

18. The expected timeline for the implementation of the Core Application Refresh (CAR) Programme was approved by the Council as a ten (10) year programme with a completion date set for 2030.

19. The expected timeline for the potential sourcing of a solution is yet to be determined. However, this is dependent on positive response to this RFI, and internal City of Cape Town Supply Chain Management processes.

License Model: Proprietary and Free and Open Source Software (FOSS)

20. The City specifically requests information on product and solution offerings that span both FOSS and Proprietary Software. The ecosystem architecture may be either FOSS or Proprietary Software or a hybrid combination of both. The information should include a list of benefits associated with a particular choice. Please include an overview on how the solution will be architected, deployed, operated, maintained and evolved. Please note any specific risks and associated risk mitigation strategies with the proposed solution.

Current Situation Overview

The current situation is best described as "silo'ed". There is a corporate reporting capability that is delivered via SAP Business Warehouse (BW) and SAP Portal software, run by a small team in the Information Systems and Technology Department within the Corporate Services Directorate. SAP BW is currently being migrated to SAP BW/4HANA. The capabilities across The City's directorates and departments vary vastly; basic excel solutions, complex excel solutions, localized databased solutions with reporting / dash boarding tools, bespoke / niche advanced analytics capabilities and tools. There is a Data Science Team in the Future Planning and Resilience Directorate that provide services to the organization. The Data Science Team primarily uses Free and Open Source Software (FOSS) technologies to deliver data analytics solutions to the organization.

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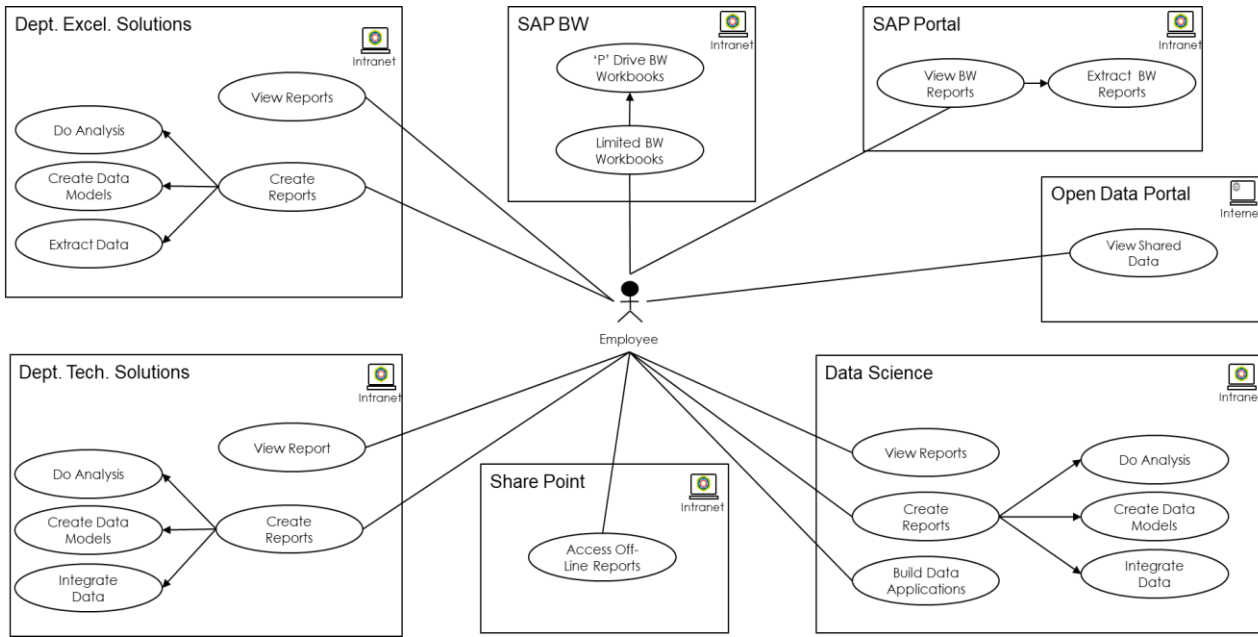
Reporting, Data and Analytics: Principles

Data and Analytics is a vast topic and capability that spans from the most basic operational report used in day-to-day business operations to complex, advanced scientific data models that are used for long term, strategic decision making for The City and its citizens. The high-level principles below have been established within an approach framework creating a structure and reference. The principles are separated into two section; 1) The process related to Data Analytics (process) and 2) Technical Principles related to the technical ecosystem.

Data Analytics (Process) Principles

Principle	Description	Practical Application
1) Analysis should be easy to discover	*extent to which, or ease with which, something can be found* It is easy to find data and the related analysis, for both humans and machines.	A workflow for the publication of analysis to a centralised portal with powerful search functionality. Standardised metadata for analytic products, that makes searching across the body of analysis easier.
2) Analysis should be easy to (not) trust	Rather than seeking to declare truth through the controlling of the analytic process or its platforms, analysis should be presented in such a way that it is easy for the audience to apply their minds to it, and reason about the degree to which they should trust its outcomes. This allows for healthy disagreement and dissent that, through a carefully mediated process, leads to a richer consensus.	
2.1) Analysis should be transparent	*easy to understand* The thinking/theory/maths behind the analysis should be presented in such a way that it is very clear, with particular attention paid to making the analysis understandable to non-expert audiences. Analyst must do the work to make their analyses transparent in order to get people to apply their mind to	During reviews of analysis, a lot of the review should focus on how easy it is to understand the work. Considerable effort would be spent in linking assumptions to any conclusions or recommendations. A requirement for publishing a piece of analysis might be that any source datasets are accessible, and can be made available to any reviewer.

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	what they have done, e.g. assumptions, limitations, calculations.	
2.2) Analysts and sponsors are accountability	*able to justify actions or decisions* It is possible for the analyst to reason about and present the transformation, dataflow or analyses. It is easy to see who was responsible for the data analysis, as well as who in the organisation requested or supported the analytic work being done.	Any analysis published should have both clear authorship, as well sponsorship information indicated.
2.3) It is easy to know who endorses analysis	*data and analyses is trustworthy* Data analyses should be capable of being reviewed and endorsed by a domain professional or another analyst or machine. The endorsement certifies the reviewer accepts the data analysis.	An analytic product may be "counter-signed" by the head of an organisational unit, on behalf of that unit, certifying its conclusions or recommendations. The metadata of analysis might contain a standardised list of endorses of the work.
3) It is easy to manage access to a dataset	*seamless administration of access to data analyses* Access and viewing permissions for data and analysis is simple to administer, robust and seamless. There is limited friction in the granting of access.	Just 2 "clicks" are required to grant access to analysis on a centralised portal. The owner of a particular analysis is the only person involved in granting access to that analysis.
4) Analysis should serve as many uses as possible	*multi-use of data analytic artefacts* Data Analytic work should be designed and performed in such a way to serve as many purposes as is reasonable. The analyses produced should be considered a building block or set of building blocks that can be used and reused to avoid performing the same model and analyses activity, repeatedly.	It would be possible to reuse data prepared for a specific data analytic need, with limited or no transformation, for another data analytic need. Data analyses should be produced in a form that facilitates it being used in multiple forms, e.g. using editable, open formats such as HTML, as opposed to formats that don't allow the easy extraction of individual components, e.g. PDF or Powerpoints.
5) The steps in analysis are clearly separated	*The different steps or components of a particular piece of analysis should be as separate as is practically possible.* When transforming data from one structure (e.g. raw) to another structure (e.g. derived), performing analyses or visualising the results, the parts must be cleanly separated in order to scrutinise each part independent from the other parts. In addition to enabling reuse, this separation would make it easier to change the details of individual steps	An analytic dashboard might be built on top of a dataset, however it should be easy to swap out the dataset used for another (with a similar structure). During the review of code used to transform some data, particular attention may be paid to making sure it is written in such a way that the code may be reused for similar transformation tasks.

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	without needing to repeat those steps that can remain the same.	
6) Consistent and standardised identifiers	*consistent and standardised identifiers across various analyses* Data and models must have globally unique and persistent identifiers. This enables easy searching and joining across various data and analyses, i.e. column names should be intuitive, clear and unique.	When reviewing a dataset for publication, particular focus might be paid on any columns which might enable linking the dataset to another one, with a view towards making such linking as easy as possible. When reviewing analysis that focuses on a particular group of people, attention will be paid to how the group under analysis is defined, so that it is consistent with similar terminology within the City.
7) Analyses should be as valuable as possible	Analysis is a difficult activity to ascribe value to, as it is often concerned with determining the value of some other activity or intervention. However, in the context of the City of Cape Town, the organisation is obligated to undertake its duties in an efficient and effective manner, and this applies to the practice of analytics within the organisation, too.	
7.1) Analysis should be relevant to the work of the City	*ability to produce a desired or intended result tied to the concerns of the organisation and residents* It is hard to know what will be useful beforehand, but data analysis should be conceived of as serving a purpose or use that is directly relevant to the concerns of the organisation or residents of Cape Town. Data analysis should be motivated by an intended result in the real world.	When reviewing analysis – is there a clear decision or action required where the answer is not immediately clear? Does work done reduce uncertainty in making a decision, or indicating whether this action should occur or not?
7.2) Analytic work should minimise effort	*data analyses should be worth the effort* Time and resource investment of undertaking should match the magnitude of the effect to the organisation or residents of Cape Town. It should be clear what the success metrics will be for performing the analyses, as well as an understanding of the opportunity cost. This can be a challenge to measure, as often the benefit from the analysis can only be determined from the consequences of the actions initiated, or decisions taken based upon the analysis. Hence, analyses can be speculative in nature, however the analysist should be able to justify the potential value to the City.	When deciding which analytic approach to use, an analyst and their manager would weigh up the relative efforts of different approaches against the likely outcomes from the analysis, and use that to help guide the selection of a method. When considering the purchase of an analytic product, the owning org unit should be able to justify the cost of the product against the benefit it would bring.

| 7.3) The value of analysis matters more than the form it comes in | *tolerate tool diversity in pursuit of value*

NB This principle is in tension with many of the others described in this document. While it may well be used as an excuse to thwart the ambitions of the other principles, it is equally a tool for keeping bureaucratic oversight in check.

The value provided by analysis, in terms of how it increases certainty, or informs a decision, should be the most important consideration when deciding upon its acceptability. | A professional in a specific domain might use a specialised analytic tool, specific to that domain, that doesn't support the best practice in terms of reusable analytic products.

However, provided the value provided by doing the analysis using this tool demonstrably outweighs any alternatives (which would often not be doing the analysis at all), then the professional should continue to use that tool rather than deprive the City of its value. |

Technical Principles Related to the Technical Ecosystem

Technical Principles	Description
1) In Module Reporting, Data and Analytics:	Reporting, data and analytics needed to operate a single software application. Comes pre-configured with the software application (structures, definitions, etc.). Specific capabilities and functionality will vary across applications. Can be modified if essential.
2) Enterprise Reporting, Data and Analytics:	Capability that stands independent from the organisations transactional software applications, providing the flexibility to access, develop and analyse data, reports and dashboards across multiple software applications.
3) Self Service:	Reporting and analysis capability that provides the flexibility to access, control, build and analyse ad-hoc reports, dashboards and data, best suited to a business role.
4) Access & Authorization:	Solution access must be in line with the Identity Lifecycle Management policies and at minimum adhere to the prescribed enterprise security standards.
5) Data Sharing and Collaboration:	A capability that allows for the seamless data sharing from various software applications and collaboration across all City of Cape Town directorates, external citizens and partnerships.
6) Diverse user community:	Cater for all the information needs of The City's diverse user community. Some may have expert level technical and analytics skills and others may only be able to run and consume basic structured reporting.
7) One version of the truth:	Reporting, data and analytics solutions must present a common version of master data (attributes, hierarchies, alternate hierarchies, time dependent hierarchies, etc.) and relevant transactional data from various internal and external systems.
8) Information Consistency and Governance	Leverage data and reporting governance processes, standards, and policies to establish a consistent baseline and ongoing measurement of data quality and reporting.
9) Data Landscape:	A common, high-level understanding of where data originates, should be sourced and consumed to avoid duplication, promoting ease of use and consumption of data with an appropriate amount of movement and manipulation.
10) Rationalized Tool Sets:	Limited tool sets (according to functionality) to reduce up-front training effort, promote transferability, and improve the ability to maintain and reduce support costs. Limited tool sets promote collaboration, user experience and transferability, improves ability to maintain and support, along with reducing long term and immediate overhead. More streamlined for governance and assurance.

Table 1: Guiding Principles

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Data and Analytics: Information Classification

The classification of information aids in understanding the vast spectrum of information outputs and needs. The City has a need to service internal and external information consumers with outputs across the information classification spectrum.

Information Classification	Description
Operational:	Information covering current activities in the organization. Used to enable and support day-to-day activities. Allowing for immediate, localized and tactical decision making. Often this type of reporting will come directly from the transactional systems.
Statutory:	The obligatory / mandatory submission of financial and non-financial information or reports to various stakeholders as prescribed by regulation, legislation as well as Council policies and procedures. The information / reporting should be 100% accurate and complete and fully comply with the relevant governance and audit requirements.
Financial:	Focused on presenting the financial activities and performance of the organization, normally within a specific time period linked to the organization's financial calendar. There are many standards and practices that need to be adhered to for compliance.
Management:	Collection of information across multiple business processes presented in context to understand a broader picture, allowing managers to make better decisions. Often includes comparatives and benchmarks. Used across all levels in the organization.
Analytics:	Outcome from the systematic computational analysis of data or statistics, used for the discovery, interpretation, and communication of meaningful patterns in data that can be used for decision making.

Table 2: Information Classification

Data Strategy

21. The City recently approved a Data Strategy (**Annexure A Data Strategy, BELOW**). Please provide an overview of how the proposed solution will enable the Data Strategy.
22. Provide an overview on best practices for the implementation of report, data and analytics enterprise solutions. Including reference to the synergies between reporting from transactional applications and reporting from report, data and analytics applications.

RFI Response Structure

Repose to the specific questions to be completed on the provided MS Excel spreadsheet, per the schedules listed below.

Schedule	Schedule Purpose	Compulsory to Complete
Schedule A: Product and Solution Offering Information	To get clarification on specific components of the solution.	Yes
Schedule B: General Information	To obtain some general company and product information.	Yes
Schedule C: Commercial Information	To get an understanding of the financial considerations of implementing the solutions.	Yes

Table 3: Request for Information Schedules

Schedule A: Product and Solution Offering Information

The high-level process associated with the delivery of information needs is interpreted as follows:

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The respondents to provide information relating to the functionality supporting the business requirements / features, using the high-level process above as a guideline.

Important note: The process above and the documented key features below are merely a guide for structure and reference. Respondents are invited to additionally share alternative approaches and options while at the same time providing their perspective on modern approaches to meeting and sustaining the data, reporting and analytics information needs of a large public sector organization.

23. Generic Features
 23.1. Authentication and security
  23.1.1. Explain the details of how the solution on offer authenticates user access to the reporting, data & analytics application/s that are in-line with Identity Lifecycle Management best practices.
  23.1.2. Provide details on role based rights and privileges to data and functionality. How do these authorisations achieve fine-grained access control as required?
  23.1.3. Provide details on how these role-based authorisations would link to the organisational and other hierarchies.
  23.1.4. Explain how the solution/application provides integration security for the technical landscape, network and applications.
 23.2. Deployment environment
  23.2.1. Provide details on which environment/s the application can be deployed in; single cloud, multi-cloud, on-premises, hybrid, etc.
  23.2.2. Provide an overview of the application landscape architecture.
  23.2.3. If required, provide an overview of the physical hardware required along with a sizing guidelines.
  23.2.4. If based on a cloud services architecture provide an overview of the services required and the associated sizing guidelines.
 23.3. Code management and robustness
  23.3.1. Explain how the application manages code (including functional changes) and how robustness is ensured during the code creation and evolution lifecycles.
 23.4. Process automation
  23.4.1. Provide details on the solution's ability to automate processes, such as meta-driven data automation, code generation and data anomaly detection, in an integrated manner, across the landscape.
 23.5. Monitoring
  23.5.1. Provide details on the application's ability to monitor the operations of the ecosystem, in an integrated manner.
  23.5.2. Explain its ability to provide alerts that are based on thresholds and benchmarks that can include batch processing, data pipelines, cost consumption (where applicable) and landscape health indicators.
 23.6. Governance, management and standards
  23.6.1. Explain how the solution achieves open standard principles regarding the retrieval and storage of data such that the data ingested and consumed is done so according to a universal standard?
  23.6.2. Provide details on the system procedures and controls that are in place to ensure quality, security and compliance across the landscape. What data governance capabilities are in place to assist with the unification and management of data from various data sources, ensuring consistency, visible data lineage and accessibility?

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23.7. Data quality

    23.7.1. Explain the capabilities that are in-place supporting standard and custom data quality rules that can validate any data at any stage.

23.8. Data cataloguing

    23.8.1. Explain the solutions capability to view and manage the meta-data of the data in the landscape.

    23.8.2. Does this capability include features such as the ability to view the different data sources ingested, the data owners, transformation logic, the business rules and definitions, etc.?

23.9. Data lineage

    23.9.1. Explain which features are available that allow the user to track the processing and flow of data over time. This capability should allow for a clear understanding of where the data originated, how it has changed and its ultimate destination within the data pipeline.

23.10. Data lifecycle - retention and aging

    23.10.1. Explain how the solution provides the ability to implement data lifecycle management across the landscape, providing for different storage types or classes (i.e. warm, hot, cold, and archived) based on access frequency and other needs. Retention would be determined per data set. It should be noted that some data may need to be kept for 30+ years.

23.11. Centralized and decentralized capabilities

    23.11.1. Explain what capabilities are in place that allow the delivery and consumption of centrally delivered information needs.

    23.11.2. Explain what capabilities are in place that allow for the full feature enablement for decentralised user communities with diverse skills.

23.12. Data masking and data encryption

    23.12.1. Provide details on the data masking standards and capabilities of the solution.

    23.12.2. Provide details on the encryption standards and capabilities of the solution.

23.13. Scalability, Performance and Reliability

    23.13.1. Explain how scalability and performance are achieved across the landscape for routine demand, ad-hoc demand and demand escalation over time.

    23.13.2. What measures are in place that will ensure up time, fault tolerance and robustness across the landscape?

23.14. Skills

    23.14.1. Provide a best practise overview of the skills and the optimal team structure required to operate, maintain and evolve the solution. Provide specific differentiation for FOSS and Proprietary Software if necessary.

    23.14.2. Provide an overview of skills required to support the solution. Provide specific differentiation for FOSS and Proprietary Software if necessary.

    23.14.3. Provide an overview on the feasibility of solution support being done in-house or outsourced.

24. Data Movement Features

24.1. Data Movement

    24.1.1. Explain the best practise applied within the ecosystem to support and enable the seamless movement of data to enable the discovery, preparation and movement between internal and external source systems for reporting and analytics.

    24.1.2. How does the solutions data movement process manage and cater for structured data, unstructured data and semi-structured data?

    24.1.3. What system controls are provided to ensure that the data moved remains valid, accurate, complete and timeous?

24.2. Data Movement Cycles

    24.2.1. Explain how the solution provides for and manages different data movement frequencies, e.g. batch, real time, near real time, streaming, ad-hoc, etc.

    24.2.2. Provide an overview on how the solutions will enable seamless, open access to data from operational systems.

24.3. Data Change

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24.3.1. Provide an overview as to how the solution caters for data changes, e.g. Delta updates, full updates, version changes, point in time snapshots, etc.

24.4. Connectors

24.4.1. Provide detail on the standard connectors and formats provided for modern and conventional data sources, e.g. text files, relational databases, hierarchical electronic data exchange (EDI), eXtensible Markup Language (XML), legacy formats, enterprise applications, cloud solutions, Application Programming Interface (API), Internet of Things (IoT) devices, Artificial Intelligence (AI), Machine Learning (ML), etc. that allow for the connection to data systems and sources.

24.5. Extract Transform Load (ETL)

24.5.1. Explain the capabilities that are in place that enable the process of extracting data from a source system, transforming the data into the desired format and loading it into a data storage or data processing location.

24.5.2. Are there any standard capabilities in place that allow for simplification in the transformation of complex data structures? Can automation be implemented for predefined use cases and scenarios?

24.5.3. Provide detail on the degree of transparency and the visibility of transformations during the ETL process.

24.5.4. Can features such as the connections, mappings, transformations, etc. be represented visually?

25. Data Storage Features

25.1. Central Data Storage

25.1.1. Provide details on the capabilities that allow for the storage and securing of data within a centralized repository. How does this capability support all forms of data, whether in a raw or processed state and cover structured data, unstructured data and semi-structured data that has been extracted from diverse sources?

25.1.2. Explain how cost efficiency is achieved in the storage of data.

25.2. Data Retrieval

25.2.1. Provide an overview of how the solution enables the ability to retrieve data for a variety of data processing needs, e.g. data warehouse models, data science activities, artificial intelligence processing, machine learning processing, data sharing, data applications, reporting, data analytics, etc.

25.3. Data engineering

25.3.1. Explain how the solution enables modern data engineering functions related to the collection and usage of data, which includes the ability to transform raw data into structured data that is ready for SQL analytics, data science processing, machine learning processes, analytics, reporting, etc. with low latency.

25.4. Data Organization Framework

25.4.1. Provide an overview of the recommended data storage framework for the solution to organise the data so that it supports business and technical process groups, data types, usage, security, user roles, data retrieval, data modification, data preservation, etc.

26. Data Processing Features

26.1. Source and Structure Data

26.1.1. Provide details, for reporting and data analytics purposes, on the solution's ability to source, load, store and structure data in logical layers to enable data transformation, optimisation and transparency.

26.1.2. Provide details on the modes of data consumption and ingestion that would be used and how the logical layers are established, i.e. physical or virtual structures.

26.2. Data types

26.2.1. Provide details on the standardized data types and formats that can be ingested and consumed by the solution. How does the solution make use of these standard data types for optimal query design and performance?

26.3. Granularity

26.3.1. Provide details on the solutions ability to ingest, manage and query data, which may be present in full detail, at an aggregated level or at multiple levels, regardless of the level of data detail while being inclusive of historical data.

26.4. Transactional data

26.4.1. Provide details on the solution's ability to access, store and structure data such that it represents the activities of the organization, i.e. procurement, maintenance, financial activities, service delivery, etc.

26.5. Master Data

26.5.1. Provide details on the solution's capability to access, store and structure reference data about the organizations entities and structures which includes standard and alternate hierarchies (i.e. financial, organisational, operations / service delivery, etc.).

26.5.2. Provide an overview of the solutions functionality to manage the master based on the current position and the 'as-was' position at a past point in time.

26.6. Data Restrictions

26.6.1. Provide details on the capabilities of the solution that are in place that allow for the restriction of data based on filters, parameters, multiple hierarchical levels, security objects, etc.

26.7. Analytical Data Models

26.7.1. Provide an overview of the functionality that enables the creation of data models using diverse data from one or more sources such that it can be structured to provide insight, related to the specific request or subject domain.

26.7.2. How does the solution provide for a data structure that can easily be consumed by diverse user communities?

26.7.3. Provide an overview of the time variants and time series functions available in the solution?

26.8. Key performance indicators

26.8.1. Provide details on the solution ability to create and maintain key performance indicators that adhere to industry standards and the organisation specific business rules and definitions.

26.9. Querying data

26.9.1. Provide details on the solutions capability regarding the querying and interpretation of data across the logical layers.

26.9.2. Does the solution use a proprietary data query language?

26.9.3. Does the solution support the American National Standards Institute (ANSI) Structured Query Language (SQL)?

26.10. Analytics and mathematical functions

26.10.1. Provide an overview of the analytics and mathematical functions that are delivered standard, allowing for the processing of data to generate insights?

26.11. Machine learning and AI processing

26.11.1. Explain what abilities, if any, the solution provides to make use of machine learning and AI-powered processes to clean, transform, prepare, enrich and present data, information and insights.

26.12. Presentation and visualization tools

26.12.1. Provide detail that explains how the solution supports standard integration to tools that present and visualise data for reporting and analytics purposes.

26.12.2. Does the solution support standard integration to the suite of ESRI GIS application?

27. Data Output Features

27.1. Structured and static reports

27.1.1. Provide details on the solution's capability to present data from the processing layer in a predetermined and consistent format that remains static or structured.

27.1.2. Explain the functionality available that supports selection parameters and variables that allow for filtering and restriction of data.

27.2. Visualization

27.2.1. Provide details on the dash boarding capabilities; the ability to present data outputs from the processing layer.

27.2.2. How does the solution enable the creation of graphical displays, tabular displays, custom layouts, etc.?

27.2.3. Explain the interactive features and responsiveness of the solution, e.g. filtering data, drill down, drill through, etc.?

27.3. Slice and dice

27.3.1. Provide details on the solutions ability to allow the end user to structure and rearrange data outputs to create meaningful representations for deeper understanding. Is the solution able to slice data by specific variables and structures, then analyse the subsets individually or in comparison with each other?

27.4. Storytelling

27.4.1. How does the solution allow for the creation of information stories that will aid the users in understanding and making decisions?

27.5. Formatting

27.5.1. Provide details on the ability to create and deploy formatting themes and standards, which includes font type, font size, colours, borders, shapes, images, icons, etc.

27.6. Representation of spatial data

27.6.1. How does the solution support and enable the presentation and visualisation of data in a spatial manner?

27.6.2. How does the proposed product integrate to GIS software such as ESRI ArcGIS?

27.7. Data restrictions

27.7.1. Provide details on the ability to restrict data based on filters, parameters, hierarchical levels (variable), etc. in the Data Output process.

27.8. Calculation metrics

27.8.1. Provide details on the solution's ability to build 'in-report' metrics (i.e. percentages, ratios, averages, participation, table calculations, associations, categorisations, etc.).

27.8.2. Does the solution provide for advanced control over the metrics behaviour?

27.9. Advanced functions

27.9.1. Provide details on the solutions ability to create custom calculations and equations for advanced analytics and data discovery needs.

27.10. User devices

27.10.1. Provide details on the ability for a user to interact with the solution through a variety of devices, including desktop computers, laptop computers, mobile phones, tablets, other devices and more.

27.10.2. Provide details on how the solution caters for devices that have varying screen sizes and resolutions.

27.10.3. Provide details on how the solution caters for user devices on different operating systems, e.g. Windows, iOS, Android, etc.

27.11. Mobile Capabilities and Enablement

27.11.1. Provide details of the mobile capability for the product in general and how the mobile applications are technically deployed.

27.11.2. Provide details of any limitations of the product's mobile capability.

27.11.3. Does the product support mobile-friendly URL pages, mobile wrapper for URL and/or natively developed mobile app?

27.11.4. How often does the mobile app need to be updated?

27.11.5. Can the mobile apps be downloaded from internet app stores?

27.11.6. Can it be deployed on locked-down devices on The City's network with no internet connection?

27.12. User collaboration

27.12.1. Provide details on the ability for the user to comment and collaborate with other users on the delivered information products.

27.13. User productivity

27.13.1. Provide details on the ability for the delivered information products to seamlessly interact with the Microsoft Office 365 suite of productivity tools.

27.14. User experience

27.14.1. Provide details on the solution's ability to allow users to access and interact with reporting and data analytics without leaving the host environment, thus allowing for a cohesive user experience.

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27.15. User view
    27.15.1.   Provide details on the solution's ability to allow the user to create, save, manage and share custom / private views.

27.16. Content portal
    27.16.1.   Provide details on the capabilities available that will allow for the logical grouping and structuring of the information products in such a way that a user can easily search for, understand and select the information product they are looking for.

27.17. Data processing
    27.17.1.   Provide details on the data output layer and how it ensures that whenever possible data processing is left to the data processing capability and minimises the movement of data between the processing layer and the output layer.

28. Technical Product Information

The respondents to provide information relating to the technical components and specifications of the proposed product:

28.1.   Provide application and technical architecture diagrams. Explain how the solution will be deployed and give details on whether the solution is available on-premises, as a cloud solution, or a hybrid offering.

28.2.   Data Architecture
    28.2.1.   Provide details of the main data objects, how the master data is managed, data sourcing options from other systems, and how data is exposed to other systems.

28.3.   Integration Architecture
    28.3.1.   Provide details of the integration requirements and adherence to Application Programming Interface (API) standards. Provide details on the integration framework inherent in / native to the product.
    28.3.2.   Provide details on the approach of incorporating an external integration framework and specify additional development required.

28.4.   Security Architecture
    28.4.1.   Provide security diagrams and specify the details. Indicate shared responsibility models, high availability offerings, and compliance with POPIA regulations such as data residency. Indicate posture management and audit log functionality, e.g. MacAfee SIEM integration via syslog or Application Programming Interface (API). If the solution is cloud based, indicate how it works with a cloud access security broker such as Netscape Cloud Access Security Broker (CASB) and any potential issues foreseen. Where are the points of presence located?

28.5.   High Availability and Redundancy Architecture
    28.5.1.   Provide details as to how the product will support both high availability requirements as well as creating sufficient redundancy to support a mission critical environment.

28.6.   Deployment Architecture
Provide details of the following deployment architecture components:
    28.6.1.   Specific deployment options available from an infrastructure point of view, example cloud-based, on-premises or a hybrid deployment.
    28.6.2.   If cloud-based, detail the use of public cloud, private cloud or ability to install cloud components on premises – including cost implications.
    28.6.3.   The underlying database technologies.
    28.6.4.   Infrastructure requirements.

28.7.   Technology Architecture
    28.7.1.   Provide details of how agile technology is incorporated to support immediate business requirements and needs, for example, micro services.

Schedule B: General Information

29. General Company Information

The responder is to provide information relating to the company and product itself:
29.1.   Company Background

29.1.1. Provide details on your company structure and mode of doing business in terms of using large account resellers (LAR), value-added resellers (VAR), Systems/Solution Integrators or direct engagements.

29.1.2. Provide details around the provisioning of software and all other licensing, implementation services, accreditation programme, training, ongoing maintenance of the solution and main representative in South Africa.

30. Product and Solution Overview
30.1. Product Information

30.1.1. Provide details of the product and software offerings via attachments, brochures, or web articles.

30.1.2. Provide details and electronic links to demonstrations.

30.1.3. Provide details on trial product offerings and stipulate the trial period.

30.1.4. Provide details on how a copy of the product can be installed in The City's innovation laboratory.

30.2. Product Lifecycle and Enhancement Process

30.2.1. Provide details on how the solution can be constantly updated and enhanced based on new requirements from the Directorate.

30.2.2. Explain the approach to new developments in terms of the product lifecycle methodology with reference to the development, quality assurance, training, and production systems.

31. Product and Solution References
The respondents to provide information relating to the implementation of the product and where the product is successfully deployed:

31.1. Local Footprint

31.1.1. Provide details of where the proposed and recommended products have been implemented locally in South Africa.

31.2. International Footprint

31.2.1. Provide details of where the proposed and recommended products have been implemented internationally.

31.3. Public Sector and/or Government Footprint

31.3.1. Provide details of where the proposed and recommended products have been implemented in the public sector or government sector, either locally or internationally.

32. Contactable References
Provide updated contact details of at least two (2) contactable references, with the details of when the implementation was completed, the scale and type of project, as well as the product version number.

32.1. Contact 1:

32.1.1. Provide details of the implementation, specifically addressing the scale and duration of the implementation.

32.1.2. Provide the completion date of the implementation.

32.1.3. Provide the product version number that was implemented.

32.1.4. Provide the company details:

32.1.4.1. Company name and details

32.1.4.2. Contact person name and surname

32.1.4.3. Role on the implementation

32.1.4.4. Telephone number

32.1.4.5. Email address.

32.2. Contact 2:

32.2.1. Provide details of the implementation, specifically addressing the scale and duration of the implementation.

32.2.2. Provide the completion date of the implementation.

32.2.3. Provide the product version number that was implemented.

32.2.4. Provide the company details:

32.2.4.1. Company name and details

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32.2.4.2. Contact person name and surname
32.2.4.3. Role on the implementation
32.2.4.4. Telephone number
32.2.4.5. Email address.

Schedule C: Commercial Information

33. Indicative Pricing and Commercials

The City needs to assess the financial impact for the implementation of a data, reporting and analytical solution as a key enabler for The City to make sense of its vast volumes of data and information.

The costing should be stated in South African Rand (ZAR) as far as possible and must include all duties, taxes and levies payable, but exclude South African Value Added Tax (VAT).

All costing must be net of any Original Software Manufacturer (OSM) discounts and reseller mark-ups.

Scope of information product deliverables and quantities required by level of complexity

Information Product (Reports / Analytics)	Quantity by Level of Complexity							
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Total
Operational	175	175	100	40	20	10	0	**520**
Statutory	50	75	150	150	100	50	0	**575**
Financial	50	75	100	100	50	50	0	**425**
Management	25	25	75	100	100	100	0	**425**
Analytical Models	0	0	0	15	15	15	10	**55**
Total	**300**	**350**	**425**	**405**	**285**	**225**	**10**	**2 000**
Note: For level of complexity, 1 is simple and 7 is extremely complex. Factors that influence complexity are number of metrics, number of hierarchies, drill-downs, drill throughs, report / analysis design, data in context, data and report restrictions, data aggregations and duration, GIS Overlay, complexity of calculations, mathematical & analytics functions, report / analysis variables & prompt selections, slice & dice capabilities, number of data sets required, etc.								
Note: There will be in excess of 500 data sets required from a variety of systems, with varying levels of complexity to deliver the information products.								
Note: Data volume across the ecosystem is expected to exceed 100 terabytes.								

Table 4: Information Products Quantities by Level of Complexity

33.1. User Roles and Quantity Requirements: Provide an overview of the user roles within the solution, along with the quantities required and how they relate to the roles and quantities documented in Table 4: Anticipated Roles & Quantities

Role	Description	Licence Quantity
Global Administrators	Master administrators managing the whole solution.	**3 - 7**
Local Administrators	Directorate / department administrators managing 'zones' or 'hubs' dedicated to the directorate / department within the central ecosystem.	**30 – 40**
Global Developers	Technical developers and data engineers that build information products across the whole solution.	**5 – 15**
Local Developers	Directorate / department technical developers and data engineers that build information products 'zones' or 'hubs' dedicated to the directorate / department within the central ecosystem.	**50 - 70**
Data Analysts	Users with technical skills and capabilities to analyse and understand data. The skill sets may vary vastly. Generally	**500**

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Role	Description	Licence Quantity
	analyst are able to build data models, reports and dashboards. Data analyst could be central resources or located within a specific directorate or department.	
Data Scientists	Users with advanced skills and capabilities in the fields of analytics applying mathematics, statistical and machine-based technical skills to process and gather insights from data. Data Scientists could be central resources or located within a specific directorate or department.	**50 - 70**
Users	Consumers of the content provided by the other roles. User skills vary vastly. Users will also span all levels of the organisations.	**4 000**

Table 5: Anticipated Roles & Quantities

33.2. Software cost
    33.2.1. Provide a quantity and cost breakdown for perpetual software licences.
        33.2.1.1.   Initial purchase cost.
        33.2.1.2.   Annual maintenance fee.
    33.2.2. Provide a quantity and cost breakdown for recurring software subscription licences and/or services.
    33.2.3. Explain in detail the construct of the software licence model. Please include references to subscription licences or perpetual licences, user licences, capacity licences, module licences, role licences, etc.
    33.2.4. If the solution comprises a number of individual components, please provide the cost per component, e.g. underlying database, etc.
33.3. Hardware cost
    33.3.1. Provide a detailed cost breakdown associated with the hardware required for the solution.
    33.3.2. Indicate if no hardware is required as the solution is service based, cloud-based, etc.
33.4. Implementation cost
    33.4.1. Provide a detailed breakdown of costs related to the setup and deployment of the solution.
    33.4.2. Provide a detailed breakdown of cost related to the development and deployment of the information products per Table 4: Information Products Quantities by Level of Complexity
    33.4.3. Indicate clearly any specific cost associated with geospatial enablement and implementation with existing City applications in ESRI GIS.
33.5. Solution maintenance and support cost
    33.5.1. Provide an overview of the cost to maintain the solution on a monthly basis. This would include management of the solution, fixing faults, applying patches, enabling new features, upgrades, etc.
    33.5.2. The solution will require support 24 hours a day, 7 days a week. Level 1, 2 and 3 support will be provided by trained City staff. Provide a cost per incident for escalated support requirements.
33.6. Other costs:
    33.6.1. Please provide an overview on training costs associated with the implementation of the solution. Training costs to be broken down by user roles / solution functions.
    33.6.2. Provide an overview of and costs associated with the conclusion of the contract, e.g. data transfer costs (excluding network provider costs), etc.
    33.6.3. Provide a breakdown of back-up and redundancy cost.
    33.6.4. List any other costs not already specified.
33.7. If costs are based on any type of price tiering, please clearly indicate this and provide detail regarding the tiering and any thresholds.
33.8. If costs are based on a currency other than the South African Rand (ZAR) please clearly indicate this and provide the rate used for any conversions.

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33.9.   Provide a costing model (software, hardware, implementation, maintenance & support) for a 5-year contract term. Please also indicate escalation cost for a 7-year and 10-year contract extension.

Note: This is only a guideline. Respondents to this RFI can deviate from the pricing table (MS Excel document); however, please try and provide your pricing information in the specified format as far as possible.

Interaction with Respondents

34. Respondents are advised that The City reserves the right not to utilise information gathered during the RFI process in order to complete a specification which is to be put forth for tendering.

35. Send any questions or technical queries to car.rfi@capetown.gov.za .

36. The City reserves the right to engage with the respondents on 'Question of Clarity' related to the RFI should the needs arise.

Proof of Concept

37. The City reserves the right to engage respondents to look at different methods to validate and test information provided in response to this RFI. This will not result in any financial contribution towards proofing the respondent(s) concepts but will allow The City to engage after the conclusion of this RFI with the aim to ensure the information provided is validated and tested.

No Obligation

38. This RFI places no obligation on The City to embark on any subsequent process to obtain any product or solution offering listed herein and respondents hereto shall obtain no preference or favour by responding to the RFI.

39. Responses to this RFI are voluntary. Do not include any proprietary, classified, confidential, trade secret, or sensitive information in your response. The responses will be reviewed by City staff, and individual feedback will not be provided to any respondent. The City will use the information submitted in response to this RFI at its discretion. The City reserves the right to use any submitted information on its public websites, in reports, in summaries, in any possible resultant solicitation(s), grant(s), or cooperative agreement(s), or in the future development regarding this subject.

40. This RFI is for information and planning purposes only and shall not be construed as a solicitation, grant, or cooperative agreement, or as an obligation on the part of the City. The City will not pay for the preparation of any information submitted or for the use of such information. No basis for claims against the City shall arise as a result of a response to this RFI or from the use of such information.

41. The research obtained from this RFI will inform the technical and functional specification of the proposed goods and services to be obtained, which may then follow an open competitive bidding process, should The City opt to implement such a system (Viability and Feasibility assessment, budgetary provisions, etc.). The City reserves the right not to proceed with any further process, should the research/technology indicate it is not viable and feasible. The City reserves the right to apply different procurement strategies, while exploring different methods to validate and test information provided in response to this RFI.

Submission Requirements

42. Please provide all inputs electronically on or before **16H00 Friday, 24 May 2024**.

43. All responses to be sent to: **car.rfi@capetown.gov.za**

Thank you

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Demand Management
Directorate of Finance
Department of Supply Chain Management