ثانياً: جدول مواصفات المواد

الرقم	المادة	المواصفات	وحدة القياس
	تحدد الجهة الحكومية المواد المطلوبة		

66 المعدات

أولاً: الشروط الخاصة بالمعدات

تخضع المعدات المستخدمة في تنفيذ الأعمال للمواصفات والمقاييس المعمول بها في المملكة العربية السعودية.

ويفحص المتعاقد جميع المعدات ويوصي باعتمادها في حال كانت مطابقة من جميع النواحي للمواصفات والمقاييس العالمية كما يجب عليه فحص جميع شهادات اختبار هذه المعدات التي أجريت في المصنع ومراقبة وتصديق اختباراتها في الموقع أو مكان الصنع وفي جميع الحالات التي تنص فيها شروط توريد المعدات أو المقاييس العالمية على إجراء هذه الاختبارات كما يجب عليه أن يحتفظ بشهادات الاختبارات التي تجري بهذا الخصوص.

ثانياً: جدول مواصفات المعدات

الرقم	الآلة	المواصفات	وحدة القياس
	تحدد الجهة الحكومية المعدات المطلوبة.		

67 كيفية تنفيذ الأعمال والخدمات

يهدف المشروع توفير منصة متكاملة تحقق المتطلبات الوطنية في مجال حوكمة البيانات و إدارتها و ولمؤشرات القياس وأداء كافة الاعمال بحيث يمكن الوصول اليها لاستعراض و تحليلات وتقارير مفيدة تدعم عملية اتخاذ القرارات و استخراج التقارير او Dashboard من خلال استخدام افضل التقنيات و تطبيق حلول هندسة البيانات فيما يخص جودة البيانات وحوكمتها على كافة قواعد البيانات، وأتمتة إجراءاتها و توثيق أصول البيانات و البيانات الوصفية و أتمتة دليل البيانات لتوحيد البيانات وتسهيل عملية الوصول اليها و مشاركتها من خلال استخدام الحلول التقنية المساعدة و بناء نظام أساسي عالي الأداء وقابل للتطوير في EDW وBig Data Analytics ، وتوحيد إجراءات العمل الخاصة بإدارة البيانات، ومراقبتها من خلال مكتب إدارة البيانات والعمل على :

- مراقبة ومعالجة مستوى جودة البيانات من خلال استخدام أدوات فحص جودة البيانات ومراقبتها وحل مشاكلها إدارة البيانات الرئيسية والمرجعية وتجميع جميع مصادر البيانات واعتماد مبدأ المصدر الواحد مما يتيح سهولة الوصول إليها وتحليلها.
- زيادة الإنتاجية من خلال تحسين جودة وسرعة عملية اتخاذ القرارات عن طريق الوصول إلى معلومات دقيقة وموثوقة.
- تطبيق تقنيات تحليل البيانات المتقدمة على المعلومات المخزنة في مستودع البيانات لاكتشاف أنماط واتجاهات جديدة. والتنبؤ المستقبلي من خلال استخدام تحليلات مستودع البيانات للتنبؤ بالاتجاهات المستقبلية واتخاذ إجراءات مبنية على التوقعات الذكية وبناء الثقة في البيانات، ودوافع المستخدمين وكفاءتهم.
- تمكين الخدمة الذاتية من خلال البيانات وBI، وتنفيذ طرق فعالة للوصول إلى جميع أصول البيانات، المسموح بها ضمن إرشادات الخصوصية وضوابط الأمان، وبناء حلول لتلبية احتياجات البيانات من خلال القدرات التي من شأنها أن تقدم قيمة بسرعة وثبات.

أولاً : متطلبات منصة أتمتة إجراءات إدارة البيانات وحوكمتها

يتضمن نطاق عمل هذه الجزئية تطوير منظومة حوكمة وإدارة البيانات من خلال توفير منصة موحدة للحلول التقنية المساعدة لأتمتة إجراءات إدارة البيانات وحوكمتها ضمن المواصفات الفنية والوظيفية المذكورة في هذه الوثيقة. يجب ان تكون المنصة مدعومة بمحرك ذكي باستخدام تقنيات (AI / ML) لتسهيل وتسريع إجراءات حوكمة وادارة البيانات .
يشمل نطاق العمل توريد وتركيب وتشغيل المنصة الموحدة لحوكمة وإدارة البيانات:

1. أدوات حوكمة البيانات (Data Governance) شاملة للأدوار الوظيفية وإدارة السياسات
2. أدوات إدارة البيانات الوصفية ودليل البيانات (Enterprise Data Catalog Management).
3. أدوات إدارة جودة البيانات (Data Quality Management)
4. أدوات إدارة خصوصية البيانات(Data Privacy Management)
5. أدوات إدارة البيانات المرجعية والرئيسية (Master & Reference Data Management)

1-Data Governance Module specifications:

- Administration Console.
- Data Policies/Policy Manager to create, modify and assign governance policies.
- Data Stewardship/Ownership – build a sense of ownership among users.
- Provide dedicated communications channels to data owners and stewards.
- Enable Workflow Manager for creating customizable data management workflows.
- Data Governance Change Requests Management and Data Maturity Dashboards.

- Provide effective collaboration among different departments within the same Entity or different Entities.
- Permission and Data Access Tracking and Regulatory. Compliance Support and Reports.
- Full Audit Logs and History.
- User Analysis.
- Provide a dashboard to track the data governance adoption process.
- Provide a module for publishing data sets to be available for other departments and may be external entities to enable the data sharing in a secure and governed way.
- Clearly Define Roles and Responsibilities Like Data Owners, Data Stewards.
- Understand CHANGES about data usage and controls.

2-Data Catalog & Metadata Management specifications.

- ability to connect to a wide variety of structured and unstructured data sources- DB Schemas, DB files, data lake, real-time data ingestion, and APIs.
- Provide out of the box Comprehensive natural language advanced search capabilities to support natural language search through the entire data catalogue to find data easily and quickly - tables, files, queries, articles, and workbooks all in one place.
- Provide robust filtration capabilities to expedite the process for searching and finding the targeted technical assets.
- Provide intelligent data discovery leveraging to classify data into data domains for field.
- Metadata extraction and discovery should be provided in an automated.
- Data catalog should be able to keep historical changes of the captured technical metadata.
- Data catalog should allow users to curate the automated scanning results.
- Data catalog should provide metadata enrichment features where users can add description and additional manual tagging along with custom attributes to the provided built-in data catalog model.
- Data catalog should provide column similarity features where it can discover similar column through scanning the data similarity between column content across the data landscape.
- Data catalog should be able the construct visual lineage for traceability and impact analysis purposes where users can view end-to-end view for the data flow from their

sources (e.g., databases) to their end points (e.g., reports) showing how the data are moving between various data points.

- Data Catalog should be able to extract data flow out of the transformation engines to visualize the data flow between the data repositories.
- Able to build lineage using relationships/ SQL Parsing (Query logs), PL/SQL, T-SQL, Teradata SQL, Tableau, Power BI, etc.
- Data catalog should provide the capability of assigning data owner and steward to technical assets and capability of searching by data domains (classification).
- Provide configurable automation to associate/link defined business glossaries with technical metadata.
- Provide a robust and easy to use search capabilities where empower the business user to select an object then the system automatically and intelligently shows all the interconnected objects.
- Provide simplified business lineage capability which is abstracted from the technical lineage which resulted from the built-in integration with the Data Catalog.
- Automatically capture identify and flag sensitive data, PII data, PK, FK, natural keys, critical data elements (CDEs) etc.
- Support for ingesting Metadata from CSV, XLS, MSSQL, MySQL, JSON, XML
- Able to generate from database scripts, procedures, functions SQL parsing.
- Centralized Metadata repository/storage with drilldown capabilities
- Data Dictionary of all data and reporting assets.
- Integrate business metadata to technical metadata and Critical Data Element Definition
- Should be able to connect but not limited to the below resource types.

- Able to support Big Data.
- Able to support RDBMS – Oracle, MS-SQL, PostgreSQL, DB2 etc.
- Able to support Cloud – AWS, Azure, Google etc.
- Able to support Hadoop - HDFS, HBASE,
- Able to support No-SQL- Cassandra, Mango DB.
- Able to support ETL applications
- Able to support File formats – CSV, delimited, XML, JSON etc.
- Able to support Data Warehouse & Data lakes.

- Refresh & updates changes are automatically propagated throughout the catalogue and keep results fresh with scheduled metadata and query log extractions.
- Customized front-end ability to customize the front-end views and data catalogue pages to allow icons, labels, and URLs to be updated and customized based on requirements.
- Customized integrations support for export and import of data catalogue assets as per requirements.
- Support data sources in English & Arabic languages including character sets and script systems (native Arabic support)
- Provide simplified business lineage capability which is abstracted from the technical lineage which resulted from the built-in integration with the Data Catalog.
- Provide in a robust interconnected model where all the provided point of views (e.g., policies, glossaries, systems, data sets, stakeholders, business areas, ...) are interconnected by design.

3-Data Quality Management specifications.

To provide a Data Quality platform to manage and model data estate. The target is to handle huge amounts of data in a way that is efficient, fast and easily manageable with high performance overall especially in data retrieving. Data models will be created and populated through the new Data Quality platform and will be used for ad-hoc reporting and analysis purposes and advance analytics.

This section explains to bidders expected deliverables during project execution in addition to required insights to help them size for their proposed services to implement the solution's platform. Selected Bidder is expected to deliver the following during the project's various milestones:

1. Installation and Configuration of the Data Management platform on one environment.
2. Assess and provide the data quality guidelines in terms of procedures, rules and workflows in collaboration with defined governance bodies within the university to make sure these bodies will be able to apply a data quality process to manage the university data assets.
3. Assess and profile data to understand its quality and existing data quality issues.
4. Identify and design required data quality rules to solve existing data quality issues, enhance and enrich commercial registration data from a data quality perspective.
5. Provide a data quality recommendation report to the university with required data quality activities to help the university execute designed rules.

6. Integrated with the targeted Data Catalog while sharing the metadata like data classification rules.
7. Provide easy to use graphical interface with no code/low code for the data analyst/steward to perform their data related analysis.
8. Provide enterprise profiling and deep profiling capabilities to automatically provide profile for each table in the database and showing results in graphical user interface targeting data analyst/steward persona.
9. Provide a capability to create data quality rules using graphical interface with low/no code approach along with providing a way to associate the data quality rule with the profiling job, to be included in the profiling graphical results.
10. Provide developer interface for complex data quality rules processing using ETL like experience which developer can develop their data quality pipelines using graphical user interface relying on drag and drop capabilities while maintaining low/no code approach.
11. Provide data quality rules re-usability which allows the rules to be used many times in data profiling and/or data quality pipelines.
12. Provide a capability for detection of duplicated records through advanced techniques for de-duplication/matching using advanced logic which relies on probabilistic methods and techniques.
13. Provide a capability to compare quality scores across time to monitor the progress of the scores across time.
14. Business glossary should have a pre-configured data quality dashboard which are fed by the data quality scorecards and rules.
15. Data quality pipelines should be able to call web services for data enrichment purposes during data quality jobs run.
16. Provide out of the box dashboards for data quality on various levels while providing breakdown for these aggregated data quality results on the level of columns/fields.
17. Send notifications through Alerts and Emails for data variances.
18. Provide automatic validation, approval workflows.
19. AI/ML Enabled DQ.
20. Data Cleansing – Should include by not limited to the below:
    - Identification of Duplicates
    - Parsing
    - Standardization

- Enrichment
- Matching using algorithms
- Merging
- Quality Thresholds definition
- Joiners
- Regex capabilities
- Case converter
- Filterm, Router, Sorter, Lookup

21. Configure Metadata Management within the platform to provide metadata access, management and visualization from different technologies like database management systems as well as different data-related objects like ETLs and -Reports according to the technical and functional requirements described in this RFP.
22. The solution should provide a data dictionary module within the platform to enable adding, updating and controlling the business terms defined by data owners and data stewards in addition to mapping these business terms to the technical metadata of the data elements that represent these terms according to the technical and functional requirements described in this RFP.
23. Train the university assigned staff on using the data management capabilities within proposed platform to execute recommended actions mentioned in the recommendation report.
24. Post implementation support phase (supervision stage) for a duration of 6 Months. During this period bidders to t provide (2) data management resources to support the university to ensure the stability of the implemented system.

The following suggestions might help you size for the required implementation activities described above:

- Define data quality measures required to assess quality of commercial registration data.
- Define and design data quality rules and business validations of commercial registration data.
- Design data quality tasks with regards to commercial registration data including data profiling, data cleansing, standardization, enrichment, parsing, matching, and clustering.

Due to the nature of such required capabilities in terms of how fast the business changes its requirements; we don't recommend a "big bang" implementation approach. Rather, we prefer strong starts and quick wins than clear roadmap to progress.

the university to consider an incremental and iterative approach develop its Data quality capabilities. Thus, bidders are requested to share their recommended roadmap to develop all aspects of data quality for the university Data Sources where the current RFP should cover the following phase while the rest of phases will be implemented in other projects according to the road map and data quality strategy which the vendor will build during the analysis phase with the university team. The vendor will need to cover the following Phases:

- **Phase One (analyze and road map):**

- Analyze and understand all the important university data sources and define data rules and entity relationships between systems.
- Build a Data quality road map that the university can implement for the next 2-3 years, the road map should project future projects, manpower and software tools required in the future.

- **Phase two (data profiling)**

- Once data quality rules define a data quality profiling and checks should keep running on a scheduled basis to validate new coming data and report issues.
- DQ tool should provide dashboards of daily filtered (profiled) data and a quality index should be built for each source system, it's highly preferred that the vendor tool or solution complies with the current the university investment of current Business intelligence tools and Data warehousing.
- DQ dashboards should provide detailed analysis of the followings: o details of profiling jobs executed (exaction date and time, duration, target system ... etc.). for each profiling task the details of: number of accept record, number of rejected records, percentage of acceptance rejection, type of error's and severity level for each error should be displayed.

-**Phase 3: Data Cleansing (filed level automated cleansing) .**

- Data cleansing should be automated for most common data quality issues on filed level such as resolving (duplicate, standardization, constrains, reference check … etc.) this should be defined in the first phase while automating the cleansing will run against a subset of reported data issues based on the university approval for fixing automation.
- Data Cleansing (non-automated). During the analysis phase and after doing data profiling we are expecting to face some data quality issues that can't be fixed through standard cleansing procedures.
- The vendor will be responsible first to report such issues and assign a severity level for it in addition to display it on dashboards and to recommend – if possible-a technical solution to resolve such issues in cooperation with the university team.

-Phase 4 (stabillze and support).

This phase is expected to start after the 3 above phases are implemented, the main purpose of this phase is to make sure a smooth running of the solution for at least 6 Months. Execute the manual cleansing based on team capacity (20 team members * 8 hours for 6 months), with coordination with the university IT team to calculate the required time for cleansing data records per record type i.e. application used to update the dirty records.

The proposed roadmap must be descriptive to clarify bidders' commitment and plans to enrich and expand their offerings in the future through a well-defined Data quality program. We would like to hear about your current and future capabilities that empower us by doing the following:

- Move processing and analytics with Data quality and data cleansing capabilities.

Provide intuitive interface(s) for profiling, managing, cleansing and moving data to manipulate it without knowing how to code.

- Rich data transformation, data filtering, data partitioning, Standardization, deduplication and data matching capabilities.
- Enabling us make decisions incredibly fast based on continuous monitoring and analysis of events of interest as they happen and follow through with contextually relevant actions.
- Take full control and adapt to changes quickly no matter how fast the data moves or how much data we have.
- Training must cover both academic / conceptual side along with the hands-on or "on-the-job" part. Both types of training activities must be covered in proposed offerings.

- Clear Project Management and Quality Control methodologies must be described to ensure smooth delivery of the required services.

-General requirements:

- A Data Quality Framework must be proposed as part of the solution to provide the guiding principles of utilizing proposed platform's capabilities in an optimized approach and it must be applied before with the same solution.
- The solution must include the vendor's efficient methodology for performing data quality tasks.
- The solution should support both Arabic and English languages and contain a prebuilt or custom-built set of rules, syntaxes, dictionaries and libraries to process at least it should be able to track as a built in or custom developed feature data patterns in Arabic such as name, gender, address, email, organization, phone, website, etc.
- The Platform must have predefined sets of Data Quality definitions, rules and reference data that recognize common data types including but not limited to names, addresses, phones, emails, accounts, and more.
- The predefined definitions, rules and reference data must automate, accelerate and reduce development time of data quality tasks by automatically recognizing these data types.
- The predefined definitions, rules and reference data must be able to apply these predefined built-in rules and definitions to enhance the quality of recognized data types.
- The predefined master data templates must create a data model for selected master data entity, map source data to the model, allow editing of surviving records, and automatically create jobs to load data into the data model.
- The predefined master data templates must provide an editor to allow creating new master data entities using predefined templates as baseline.
- The proposed solutions libraries should be customizable, such as making changes on the existing data types, creating new data types, etc.
- The solution should provide a user-friendly interface that business users can also use it.
- It should be possible to calculate the data change ratio after the application of data quality processes.
- The solution should be extendable and/ integrated to vertical solutions across enterprise.

- The solution security capabilities must provide role-based access to authorized data stewards to manage access to attribute content by role.
- The solution security capabilities must include granular, role-based security to secure access to sensitive information when creating and editing workflows.

4-Data Privacy Management specifications.

Data standards are expressed as standard data definitions, code and value sets, business rules and technical specifications. the university believe that adherence to existing data standards will increase data interoperability, portability, and comparability. The proposer will work with the university to ensure that data quality and standards compliance are automated to the maximum extent possible.

-**Post-implementation Deliverables:**

Data Transformation Business Rule Documentation

The proposer's proposal must describe the approach that will be used to develop the business rules related to data quality and standards compliance and describe the tools and technologies that are part of their proposed solution.

-**USER AND SYSTEM DOCUMENTATION:**

the university believe that quality documentation is one key to minimizing the need for extensive training and is critical to the long-term maintenance of the Warehouse once the proposer's work is complete. Visibility into the content of the Warehouse and the source of each data element and how any calculated values are derived is required.

Post-implementation Deliverables:

- Reporting Users Guide
- Warehouse Administration Documentation
- Warehouse Data Dictionary

The proposed solution will incorporate security features which should include access controls, audit trails, etc. The solution must support encryption for data transfers and should have a hierarchical role-based permission structure to manage who can view and make changes to data.

The proposed solution must allow remote access from outside the networks without compromising security.

The proposer must provide an overview of the security controls provided in their solution, describe how their solution manages role-based security and how this will be integrated into the proposed single sign-on solution of the university.

- A capability to manage Data Security Classification policies which define rules that identify sensitive data and classify a data store to meet data security standards and comply with data privacy regulations.
- Security Classification policies should have the capability to assign data domains (leveraging data catalog capabilities) to classification policies and specify data domain match conditions, the cost of each record with sensitive data, and sensitivity level.
- A data domain match should describe the criteria that classifies the data store as a match for the classification policy.
- Automated scanning for the defined data stores with automated data domain match condition discovery and sensitivity level assignment.
- Calculate risk score for the data store based on various parameters (e.g. Sensitivity level, Protection status, Number of sensitive fields, Number of sensitive records, Number of targets, ...).
- Analyze user activity events to detect when user activity behavior significantly deviates from the baseline.
- A way to define security policy is a rule-based policy designed to detect violations or decrypt data in use.
-
- Ability to quickly locate an individual's data that might be dispersed across your enterprise data (subject registry management). Subject Registry management should be able to map individuals with their data and provide a search tool to quickly locate an individual whose data you collect and store.
- Provide built-in integration with the Business Glossary component to push data classification and risk score results on the cataloged data stores to provide data privacy related results and attach it to the subject data stores.
- Built-in integration with Data Catalog tool to share and reuse data domain definitions on a single and unified metadata management platform to be leveraged in defining data privacy classification policies in the data privacy management component.

- Customized security model role-based access that can hide data assets and columns from certain users or groups of users based on the classifications of the data assets and columns.

5-Master & Reference Data Management specifications.

- Manage golden records.
- Edit master data.
- Author new data.
- Verification of automated merging and consolidation rules.
- Integration with data profiling, data quality management, and business glossary.
- Support for hybrid (transactional and registry) models of MDM.
- Connect to a variety of delimited flat files such as .csv, .txt, or .xls, as well as XML and JSON formats.
- Semantic search capabilities.
- Point of entry validation/batch matching.
- Support real-time integration (APIs) for Master and Reference data.
- Support data standards such as Web Services, XML, CSV.
- Support for XML exports.
- Role based data access.
- Handling complex relations between the different master data domains.
- API support for golden record search and use.
- Export Master Data for trusted reference .

ثانياً: مستودع البيانات (Data Warehouse and Business Intelligence Solutions)

The solution will serve as a single repository of data with appropriate dashboards and metrics so that stakeholders have the information and tools necessary to continuously improve the university performance.

The university plan to take a phased approach to the data warehouse implementation beginning with academic parts then the other management parts.

أ. **نطاق العمل الخاص بمستودع البيانات.**

يشمل نطاق عمل جزئية توريد وتركيب وتشغيل وإدارة مستودع البيانات المهام التالية:

10. تقييم الاحتياجات: دراسة وتحليل المتطلبات لمستودع البيانات وتحديد الخصائص المطلوبة والميزات المحددة للمستودع، على أن تتضمن:

- تحليل المتطلبات والفهم الكامل للأهداف المرجوة من المستودع.
- تحديد الأنواع المختلفة من البيانات المطلوب تخزينها والاحتياجات المحددة للتحليل والتقارير.
- تحديد متطلبات الأمان والحماية للبيانات المخزنة.
- إعداد تقرير تحليل المتطلبات والأهداف المرجوة من مستودع البيانات شاملاً قائمة أنواع البيانات المطلوب تخزينها واحتياجات التحليل والتقارير الواجهات المراد توفيرها

11. تصميم المستودع: تصميم هيكل المستودع والمخططات اللازمة لتخزين وتنظيم البيانات، ويتضمن:

- تصميم هيكل المستودع وتنظيمه الداخلي.
- تحديد طرق التخزين والاسترجاع والتخطيط للاحتياجات المستقبلية.
- إعداد وثيقة تصميم هيكل مستودع البيانات والمخططات الداخلية لتخزين وتنظيم البيانات بالإضافة الى وصف للأدوات المستخدمة لإدارة المستودع وتخزين البيانات

12. تركيب مستودع البيانات: توفير والبرمجيات والأنظمة اللازمة لتشغيل المستودع، ويتضمن:

- تركيب مستودع البيانات وإعداده للتشغيل والإدارة وتخزين البيانات.
- تنفيذ إعدادات الأمان والحماية للحفاظ على سلامة البيانات.
- إعداد تقرير عن نتائج التركيب والتشغيل والاعداد لمستودع البيانات على البنية التحتية التي ستوفرها الجامعة شاملاً لأنظمة التشغيل.
- توفير الدليل الارشادي لإجراءات تثبيت وإعداد نظام مستودع البيانات لمشرفي والفريق التقني بالجامعة.

13. تحديد وتحميل البيانات: جمع البيانات من المصادر المختلفة وتحميلها في المستودع وفق منهجية يتم اعتمادها من قبل فريق الجامعة، وتتضمن:

- جمع البيانات من مصادر مختلفة مثل مصادر البيانات من قواعد بيانات وغيرها.
- تحميل البيانات إلى المستودع وفقاً لخطة يتم اعتمادها من قبل فريق الجامعة.
- إعداد تقرير عما تم أنجازه بشأن جمع البيانات من المصادر المختلفة الموجودة في الجامعة وتحميلها في المستودع شاملاً لقائمة البيانات المخزنة في المستودع بعد عملية التحميل

14. تهيئة وتحويل البيانات: تحويل البيانات إلى صيغة متوافقة مع مستودع البيانات وتجهيزها للتحليل والاستخدام، ويتضمن:

- تنقيح وتهيئة البيانات لتكون جاهزة للتحليل والاستخدام.
- تحويل البيانات إلى الصيغ المناسبة لمستودع البيانات.
- إعداد التقارير بشأن ما تم تحويله من البيانات إلى الصيغ المطلوبة لمستودع البيانات ووصف لإجراءات تنقيح البيانات لأغراض التحليل.

15. تأمين المستودع: ضمان أمان المستودع والبيانات المخزنة فيه من خلال تطبيق اجراءات الحماية والتشفير، ويتضمن:

- تطبيق إجراءات أمان مناسبة لحماية البيانات من الاختراق والاستخدام غير المصرح به.
- استخدام تقنيات التشفير لضمان أمان البيانات المخزنة في المستودع.

- تقديم تقرير عما تم تنفيذه من إجراءات بخصوص الأمان والحماية لضمان سلامة البيانات شاملاً لتفاصيل تقنيات التشفير والحماية التي تم تطبيقها.

16. تجهيز الواجهات والتقارير: توفير واجهات استخدام سهلة وتقارير مفصلة للمستخدمين للاستفادة من البيانات المخزنة في المستودع، ويتضمن:

- تصميم واجهات مستخدم ديناميكية (Dashboards) عدد ٥ على أن يتم تحديد نطاق بيانات الواجهات من قبل فريق الجامعة لاستعراض البيانات المخزنة في المستودع.
- توفير عدد ١٠ تقارير لتحليل البيانات الخاصة بالجامعة على أن يتم تحديد نوع التقارير من قبل فريق الجامعة.
- تصميم نماذج للتقارير والواجهات التي سيتم تطويرها وتجهيزها ضمن نطاق العمل قبل الشروع بتطويرها.

17. تدريب المستخدمين: القيام بما يلزم نحو تدريب المستخدمين ضمن مبنى الجامعة على كيفية استخدام المستودع واستعراض البيانات وتحليلها، ويتضمن:

- تقديم التدريب اللازم للمستخدمين على كيفية إعداد، واستخدام المستودع، وهن٨الواجهات والتقارير.
- شرح كيفية استعراض البيانات واستخدام التقنيات المتاحة لتحليلها.
- تدريب المشرفين والفريق التقني على إعداد وتشغيل وتكامل المستودع مع مصادر البيانات.
- توفير جميع المواد التدريبية لجميع البرامج التدريبية.

18. تقديم خدمات الدعم والصيانة المستمرة:

- توفير الدعم الفني المستمر والصيانة لضمان استمرارية وكفاءة المستودع، والمساعدة للمستخدمين في حالة وجود أي مشاكل أو استفسارات بعد تشغيل مستودع البيانات، والقيام بالمراجعة الدورية للمستودع وضمان استمرارية عمله بكفاءة عالية.
- اعداد تقرير نتائج المراجعة الدورية لكفاءة المستودع كل ثلاثة أشهر.

ب . المواصفات الوظيفية والفنية لمستودع البيانات.

1. Scalability: offer scalable architectures that can handle growing data volumes and increasing workloads. The data warehouse tool should support horizontal and vertical scaling to accommodate changing needs.

2. Data Integration:

   a. Supports various data connectors and ETL tools to enable seamless integration of data from diverse sources.

   b. Support structured/Semi-structured/Unstructured sources.

   c. Multilanguage Support (Arabic, English ... etc.).

   d. Integration Framework with external sources Including, but not limited to:

- Data Base (Oracle, SQL Server, MySQL, LDAP ... etc.)

- File Base (CSV, XML, SAS, SPSS ...etc.)
- Web Services (Transactional)
- Educational systems (Banner)
- Website activities
- Integration Framework with Social Networks - Facebook, Instagram, ..etc.

2. Data Transformation: Provide SQL-based data transformation capabilities for efficient data cleansing, transformation, and loading into the warehouse.
3. Performance: Employ various optimization techniques, such as columnar storage, parallel processing, and in-memory computing, to deliver high-performance query execution.
4. Security: Robust security features, including data encryption, access controls, and authentication mechanisms to ensure data protection.

5. Data Governance:

    a. Offer built-in data governance features like metadata management, data lineage, and data quality monitoring to ensure data accuracy and compliance.

    b. Data Profiling Tool to be used during the analysis of new sources and support in the model design and generate profiling stats to measure the source issues and notify the owner as needed.

    c. Dashboard to monitor the quality activities of the data.

    d. Ability to identify issues and errors in data such as (duplications, missing data or change in source information).

6. Real-time Data Processing: Support real-time data processing and streaming capabilities for near-real-time analytics and insights.
7. Integration with ETL Tools:
   a.Integrate with various Extract, Transform, Load (ETL) tools to streamline the data ingestion and transformation processes including:

- ETL with Open Adapters
- ETL Capable of Looping
- Rejection & Recycling
- Complete Validation Cycle
- Parallel load option for MPP DBs and concurrent processing
- Able to deal with Huge files and overcome platform limitation
- Data matching and consolidation features
- Change Data Capture

8. Data Compression: Efficient data compression techniques can be used to optimize storage requirements and enhance overall performance.
9. Disaster Recovery: Provide built-in disaster recovery and data replication capabilities to ensure business continuity.
10. Support for Standard SQL: Support standard SQL or SQL-like languages for querying and manipulating data, making it easier for users familiar with SQL to work with the data warehouse.

PROJECT APPROACH AND PLAN:

The proposer will be responsible for development and maintenance of the project task plan and schedule, based on the approach, methodology and tools used successfully by the proposer in previous engagements. The proposer will be responsible for regular reporting of progress against the plan, recommending corrective actions to be taken in the event of unanticipated changes to the plan or schedule, and regular updates to the plan and schedule to accommodate any changes.

To minimize cost and reduce risk, the university believes it is important for the successful proposer to use their methodology, applying it to the needs of the university. The "how" of the project should, therefore, be provided by the proposer, using a proven methodology, approach, and work plan that the proposer has used successfully in other Warehouse implementations.

Post-implementation Deliverables:

- Project Charter.
- Final Project Work Plan.
- Technical & Functional Requirements.
- Deployment Architecture.
- Installation pre-requisites checklist.
- Licenses Certificate.
- Training roadmap.
- Testing use-case & usage scenarios specification.
- Platform Installation, Configuration and testing completion.
- Training manual for users and operational guide.
- technical Support plan
- Project Completion Report.
-

The proposal must describe the proposer's philosophy, methodology, and approach to this project and to project management; describe the methods, tools, and techniques the proposer intends to use in providing project management services; provide a description of key methods or techniques; provide a high-level project plan and schedule (identifying major milestones and deliverables); describe the proposer's approach to managing the schedule, controlling costs, mitigating risk, and limiting "scope expansion" to the project.

PROJECT STAFFING:

The proposal is responsible for providing and maintain sufficient numbers of qualified management, technical and functional staff to meet the needs of this project and provide the services outlined in the proposer's response to this RFP. The proposer is also responsible for the development of a detailed resource plan for both proposer and the university' staff, which defines the staffing and staff organization, identifies all team participants and their roles and responsibilities.

Detailed Resource Plan

The proposed management structure and identify key personnel who will be assigned to this project. Resumes for all key personnel shall be included. Because project methodologies may differ, the proposal must outline the university staffing

needs based on the proposer's methodology and describe the recommended working and reporting relationships between the university and Proposer staff.

KNOWLEDGE TRANSFER:

Knowledge transfer is a continuous process designed to enable the university to properly support the operation and continuous improvement of the Warehouse without the support of external consultants. The proposer will be responsible for the development of a knowledge transfer plan for the project team. Through training, workshops and mentoring relationships, the proposer will be responsible for educating the project team in the methodology and task plan to be used on the project, the architecture and design of the warehouse, and the skills and techniques needed for ongoing maintenance and expansion of the system.

PHASED SCALABILITY:

Requirements to deliver additional subject areas should be incorporated into subsequent phases unless it is necessary to deliver any of the aforementioned functionality. Documentation on the implementation of additional data stores within the Warehouse should be included within this phase.

TESTING:

The Vendor is responsible for developing the test plan and supporting documents, which identify the processes, tools, tasks and materials to be used for system and acceptance testing of the system. The plan and supporting documents must be reviewed and approved by the university technical staff. The Vendor is further responsible for documenting the successful execution of the test plan and any modifications that were required for successful execution. Although user acceptance testing is the university responsibility, the Vendor will be responsible for development of the acceptance test plan and for the development of the acceptance test scripts. the university will modify the acceptance test scripts as required.

Post-implementation Deliverables:

- System and Acceptance Test Plans
- Documentation of Successful Test Execution
- User Acceptance Test Certification

The response must describe the Vendor's approach to testing and include an outline of a test plan that will be developed by the Vendor. At a minimum, the outlined test plan will need to address what will be tested; who will perform the testing; when the testing will be conducted; how the testing will be performed; how will the university know when testing is complete; and what will be produced from the test.

POST IMPLEMENTATION SUPPORT:

The Vendor is required to provide post implementation support for the system. The support for the system will address post implementation problem analysis and fixes. and technical support for general Warehouse administration and maintenance.

The proposal must describe the Vendor's philosophy and approach to providing the technical and functional post implementation support requested and identify the resources it would make available to the university to provide this support. The response must describe the services included in any standard maintenance agreement available to the university, and how services above and beyond the standard maintenance agreement may be obtained.

VENDOR Commitments:

- Capture the university aspirations and conduct benchmarking of relevant leading organizations and their service offerings.
- Define objectives and scope of service offerings.
- Ensure prioritization and alignment on selected service offerings.
- Capture all relevant information into charters for each service offering (including objectives,key stakeholders. project exec. Sponsor(s), project team, solution, benefit, investments, Action plan and constraints).

- Detail service offerings and determine requirements which include the following:

1. Define the KPI tree / hierarchy (by level of detail and granularity, e.g. at national, district, level, etc. and frequency)
2. Identify key data requirements in line with developed KPI's and map & validate available data sources.

3. Create resource plan and capability requirements for each service offering.

Create implementation plans for each service offering which include the following activities:

- Create detailed implementation plan with tasks, owners, and milestones for each service offering
- Track and report progress of project on a continuous basis.

Design services end to end (front-end and back-end) which include the following:

- Establish key reporting elements (e.g., trends, graphs, customization, descriptive reports etc.) across the required data dimensions and create front-end visualization mockups.
- Define strategy and scope of metadata and establish policies and procedures for creation of service and ongoing maintenance.
- Establish Data Governance committee with identified data stewards, assigned roles & responsibilities and access & archiving requirements.
- Gain alignment of required stakeholders for approval.

- Create comprehensive process and training documentation which include the following activities:

1) Create Standard Operating Procedures and Process documentation on front end functionality, database policies and IT dependencies for each service offering.

2) Develop trainings material for in-house resources and conduct training of required concepts conduct Knowledge transfer and complete handover.

- Gather technical design requirements for service offerings, which include the following activities Gather requirements on security, content management, user interactions, etc. for each service offering:

• Determine performance requirements for each service offering (refresh rate, downtime, uptime etc.).

• Determine security considerations for data and user privacy (authentication, number of layers etc.).

• Determine channels of publishing the services — BI tools, websites and Mobile Applications.

• Map out different user interaction touchpoints (logins, reviews, emails, surveys) and content management requirement (largely stable or continuous changes).

- Support sourcing of IT & BI infrastructure, which include the following activities (Based on requirements, identify high level IT architecture to facilitate the service offerings

• Evaluate supply market dynamics and identify list of system integrator vendors to be considered for RFP

• Create RFP to engage in the supply market and assess vendors based on competitiveness on capability and commercial effectiveness

• Work with vendor to evaluate and recommend IT Architecture, Hardware, Hosting infrastructure, Software and BI technology etc. required to enable the service offerings (compute power, servers, data centers etc.)

• Work with vendors to provide comparison reports and benchmarks on performance, future readiness and financial supporting design recommendations.

• Work with vendors to procure the required IT and BI Infrastructure to enable the service offerings.

68 مواصفات الجودة

- يلتزم المتعاقد بمواصفات الجودة المطلوبة في تنفيذ النطاق المطلوب. ويجب على المتعاقد إخطار الجهة الحكومية بما يتسبب او قد يتسبب في عدم الامتثال لمتطلبات الجودة في السلع المؤردة والأعمال المقدمة وبأي تغييرات أو تعديلات قد تؤثر على هذه الجودة كتغيير موقع تصنيع المواد، أو تغيير المواد الخام ونسبها المستعملة في تصنيع السلع المؤردة.