UNITED ARAB EMIRATES
MINISTRY OF HUMAN RESOURCES
& EMIRATISATION

الإمارات العربية المتحدة
وزارة الموارد البشرية
والتوطين

Request for Proposal for the Development of ENSCO Data Management System

وزارة المشاريع
PROJECTS DEPARTMENT

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Introduction

Ministry of Human Resources and Emiratization (MoHRE) in the process of development of an Occupational Master Data Classification & Management System. The scheme aims to govern, management of all data classifications, and enable a smart decision-making process for adding and or adjusting identified classifications.

Over the last two years, MoHRE has developed and maintained its specific the creation of a unified Emirates National Standards Classification of Occupations (ENSCO) system.

This ENSCO system will provide a modern central and national platform for referencing, collecting, compiling, analysing and communicating information about occupations on a national and international level. Importantly, ENSCO provides a standardised framework for organising the world of work in a manageable, understandable and coherent system.

ENSCO prime purpose is to create a data structure that will define occupations by the everyday tasks, skills and core abilities required by productive employees that will contribute to the building of a '*competitive and resilient economy*' (UAE Vision 2021).

The ENSCO system follows the international standards of ISCO-08 and is considered the national reference that MoHRE applies rules which found the primary text in managing information about the UAE labour market and its workforce.

MoHRE employment strategy is based on different dimensions such as supply and demand principles, market trends, current and future occupation and market needs, workforce planning and so forth. All these dimensions should be supported with a robust platform and system that ensures unified classification system has consistency, adaptability and comprehensive integration with all core technology systems that serve the UAE labour market statistical information needs.

System Objectives

The ENSCO system project aims to achieve the following objectives:

- Create a static, multi-functional and upgradable centralised ENSCO repository
- Development of an integrated dynamic electronic management system that enables stakeholders to choose the classified occupation before requesting the work permit.
- An integrated and interactive system linked with other related ministry systems, where all classified occupation profiles, skills and qualifications are linked with each other in reference to national and international standards
- A unified and comprehensive database to be only a single source of truth for all types of classifications including the occupation classifications
- Automated system to manage and govern the implementation of classified occupations, skills and qualifications based on the structure of ENSCO
- Integration with all MoHRE core systems, and a method to support the decision-making process for all types of classifications.
- Multi-dimensional system that identifies occupation progression routes, core competencies, skills, and qualifications.

Scope of Work

The scope of the ENSCO system project shall cover the following:

Data and classifications related to labour market including at least the following but not limited to:

- ISCO-08 Group classification
- ENSCO occupations and job titles
- ENSCO occupation profile attributes (Annex A)
- ENSCO linkage with ISIC and ISCED
- Source of core competencies, skills and qualifications
- Established business sectors
- Career pathways and progression

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- Upskilling and Training

Master Data Management system including

- Technology
- Software
- Data Governance and stewardship
- Database

Interactive search engine for all classifications and equipped with artificial intelligence capability that can provide multiple functions and be an enabler for decision-making processes. The ENSCO system must be able to act as a source for identifying:

- occupation progression across ENSCO Groups
- core competencies and skills across occupations
- essential qualifications required by industry (linkage between ISCED and ISIC)
- tool for upskilling existing labour force

A process flow for adding, editing, cancelling and suggesting which stakeholders or decision body can make quick and clear recommendations or decisions.

Capability to have seamless integration with all MoHRE core systems with real time incorporation with two selected systems during the project delivery cycle.

User manuals development including data governance manual, systems integration manual and end-user manuals.

Timeframe

The timeframe to start the development of the ENSCO system will require the approval from MoHRE.

It will be the responsibility of the contractor to conduct a full scoping exercise prior to development of the ENSCO system. This scoping exercise will include an in-depth evaluation of the required data fields and scheme of work with workflow diagrams.

This scoping exercise should be presented in a Functional Requirements Specification Report.

It would also be the responsibility of the contractor to undertake a full testing regime and piloting of the ENSCO system (including the online ENSCO portal). Therefore, a reasonable timeframe for the development of the ENSCO system should be an estimated duration of six months.

Work Plan

No	Project Objectives	Project Outcomes
1	Develop a Functional Requirements Specification Report	A baseline report that includes a database schema, dataflow diagrams, VPS and WCMS solution. This report should include design, VPS and WCMS options with financial costing to be considered by MoHRE.
2	Construction of the ENSCO system	To be developed to in-line with occupation profile attributes, online portal, and internal functionality and integration with other MoHRE systems.
3	Testing and piloting the ENSCO system	Testing the ENSCO system and on line portal, including making any necessary amendments. This stage will be supported by a full system evaluation report.
4	Creation of comprehensive user guides	This stage will include different user guides for internal staff and

		Employers. This must include staff training sessions to ensure that MoHRE staff are competent in its use.
5	A recommendation report for further development and on-going support	The contractor must ensure that a recommendation report is delivered outlining the on-going support for the ENSCO system.

ENSCO System Project Phases

The design and development of the ENSCO system will consist of the following main project phases.

1. Functional Requirements (baseline design and recommendations)
2. Construction of the ENSCO system (including an online portal)
3. Capacity Building
4. Piloting and Testing
5. Implementation of Operational Plan and Governance Structure

Phase 1: Functional Requirements

Deliverable	Milestone
• Research the development needs of the ENSCO system including all addressed capabilities above. • Identify suitable options for a VPS and WCMS that will be used for the development stage, including financial costings. • Investigate MoHRE current IT capability and make recommendations for support.	Submission of a Functional Requirements Specification Report: including a database schema, dataflow diagrams, VPS and WCMS solution. This report should include design, VPS and WCMS options with financial costing to be considered by MoHRE.

- Present a minimum of three different designs for the ENSCO system incorporating MoHRE house style.
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Phase 2: Construction of the ENSCO System

Deliverable	Milestone
• Identify the data fields in relation to the ENSCO system needs. • Build the ENSCO system. • Create search and reporting functions based on the needs of users. • Commence the development of user guides.	Construction of the ENSCO system, including the online portal and website interface design and search and reporting functions.

Phase 3: User Guides

Deliverable	Milestone
• Develop users guides applicable to different ENSCO system user needs. • Train internal MoHRE staff on using the ENSCO system functions and capabilities.	Creation of comprehensive user guides and staff training.

Phase 4: Piloting and Testing

Deliverable	Milestone
• Test and pilot the ENSCO system. • Amend the system, including the creation of any additional search and reporting functions.	Testing, amending and piloting the system, including a system evaluation report. Including a recommendation report for further development and on-going support for the ENSCO system.

Deliverables

The service provider shall provide the following deliverables

- Project plan and user requirement including the impact on information technology and required skills if any
- Master Data Management system including but not limited to:
    - Structured dynamic database capable of capturing all the defined classification and future changes, additional integrations and functionality
    - Robust search engine functionality supported with Artificial Intelligence capability
    - An electronic system to manage all ENSCO data fields, which is capable to utilising the occupation profiles to match skills, career progression and competence requirements.
    - Automated *governance* process for data management
    - Licenses for users
    - Integration with other selected systems within MoHRE
- Implementation and change management plan for complete rollout
- Documented manual for data management strategy and its related process, systems integration, user manuals, etc.

System Design

The ENSCO system must be designed on a range of data fields based on the occupation profile attributes (Annex A) and new potential applications requirements.

The identified data fields will be used to provide search facilities and information retrieval for all users. However, not all data fields will be visible to all types of users. The ability to edit data will need to be controlled by a hierarchy of account permissions. For example:

1. MoHRE staff will be responsible for the management and maintenance of the ENSCO system, and must ensure that all information is accurate. Therefore, this type of user will have full administration control over all the data fields.
2. Employers and the general public must be able to review, search and print information relating to individual occupation profiles.

ENSCO Online Application Process

It will be required that the ENSCO system will incorporate an online application process for employers to submitted request for new occupations or job titles to be added to the system. The submitting organization is required to provide specific information about the request so MoHRE governance committee can make a judgement. This process should be supported by an artificial intelligence process that make recommendations to both the employer and MoHRE.

The contractor must recommend the best virtual private server (VPS) solution, operating system and web content management system (WCMS) for the ENSCO system.

Terms of Reference

Minimum Contractor Experience

- at least 5 years of experience in designing themes and layouts for dynamic website design and DBMS
- thorough knowledge, of and experience with web design evidenced by a substantial portfolio of designed products
- relevant graphic design skills
- regional experience and knowledge of Arabic and English
- web hosting and portal design solutions

The ENSCO system will be maintained by MoHRE staff and visible to users through a web portal that can be used as an information tool for search and retrieval about ENSCO listed occupations and associated job titles.

User and Functional Requirements

A 'Functional Requirements Specification Report' must be submitted to MoHRE for consideration prior to commencing the design of the ENSCO system. This report must provide options, costs and outline a best sourced solution for the development of the ENSCO system.

Additionally, the Functional Requirements Specification Report must outline and describe the potential functionality of the system, limitations and schema for technical development. It should also outline how users will interact with the system.

There are two potential types of users of the ENSCO system:

1. MoHRE internal staff
2. Employers and the public and those with wider international interests

Each type of user will interact with the ENSCO system for different purposes, and this must be outlined in the report and supported in the technical design solution.

General Objectives

The general objectives of the contract are as follows:

1. To raise the awareness of the ENSCO to the public and other stakeholders.
2. To fulfil the aims of the ENSCO in relation to transparency and understanding of occupation profiles.
3. To provide an accessible and informative ENSCO web portal that:
   3.1. is easy to understand and navigate, for the purposes of search and retrieval of information; and
   3.2. supportive of the quality assurance and administrative processes for listing occupations and associated job titles.

Specific Objectives

The contractor must:

1. Provide Arabic and English versions of the ENSCO system.
2. Provide a database scheme and work plan for the development, quality control, rollout, full testing and implementation and management of the proposed solution.
3. Design and develop a content management system that supports the aims, operational systems, documentation and workflows of the compliance process for listing qualifications.
4. Must follow a collaborative, iterative development process with the close involvement of ENSCO staff and relevant experts; the contractor must accommodate feedback and amendments as the web portal design evolves. **Note:** This should include the provision of a test platform during the construction phase to support collaboration and enable feedback.
5. Prepare detailed technical documentation and user guides
6. Conduct training for the system administrators and primary users
7. Provide site visitor tracking/ log reporting services
8. Support the operationalization policies and procedures, that govern ENSCO
9. Ensure appropriate levels of performance of the system to prevent and minimize downtime or service interruptions
10. Ensure that access to the portal database is open to the public for information search and retrieval

11. Ensure that authentication methods and appropriate levels of permissions are applied to those responsible for the entry and maintenance of the data. A policy is required to establish responsibilities.
12. Establish links to a presence on major social network sites
13. Provide operational dashboard reporting capabilities.
14. Develop standardized reports and screens.
15. Provide an effective system audit trail
16. Consider possible future expansion of ENSCO (other relevant data) that would provide wider information to the public
17. Provide training and procedures for version updates as may be required
18. Ensure the system has appropriate backup and recovery procedures in place
19. Perform such other relevant duties as may be assigned.

System Design and Requirements

Intellectual Property Rights (IPR)

All intellectual property rights and the complete website portal content, as well as all the work performed under the contract are the express and exclusive property of MoHRE.

Menu and Organization of the Content

The contractor must advise on and propose the content (menu, organization of the homepage and the content pages), that will meet the user requirements for a clear and publicly available user-friendly website.

The contractor must propose and implement a design and layout for the ENSO online portal. The layout must be developed especially for MoHRE and not be a standardized layout. It must be clear and facilitate access to information. It must reflect the institutional image of MoHRE.

The contractor must provide three possible options in term of design and layout. MoHRE will then choose an option. Based on the chosen option, the contractor will finalize the design and layout following inputs from MoHRE.

System Requirements

- Accommodation on a dedicated ENSCO database management system and online portal
- The hosting server must be firewalled, antivirus protected
- It must be capable of handling large amount of traffic, with a quick load time on a standard connection
- The contractor must propose and implement solutions to ensure the ENSCO portal can cope with specific peaks
- The Contractor must provide advice and implement solutions in terms of Search Engine Optimization (SEO)
- The contractor must ensure data protection rules are applied.

Hosting, backup and Security

Domain: Retention of current website domain name that are held by MoHRE and the contractor must ensure the proposed ENSCO portal follows MoHRE policies on information security.

In the terms of security, the contractor must demonstrate how the system functionality includes

- Controls against Malicious Code
- Logging and Monitoring functions
- Back-up and recovery functions
- Access and Authentication controls

Testing, Documentation and Training

Specific training for the management of the ENSCO system ust be provided by the contractor to MoHRE.

The contractor must also deliver comprehensive documentation for the primary users of the ENSCO system. The documentation must not be technical and should be easy to understand for different users.

Scope of design will include the development of user guides for the MoHRE team to upload and renew information on the WBMS as required and system must be fully available for all major browsers (IE, Chrome, Firefox, Safari etc).

Annex A: Occupation Profile Attributes

Occupation Title:	[Occupation title]	**ENSCO Code:**	[6-digit code]
Major Group	[Major ISCO-08 group]		
Sub-Major Group	[Sub-major ISCO-08 group]		
Minor Group	[Minor ISCO-08 group]		
Unit Group	[Unit ISCO-08 group]		
Occupation Description:			
[High level description of the occupation]			
Key Duties & Tasks			
[Lists the occupation key duties and common tasks]			
Core Competence:			
Knowledge:	[Associated knowledge in relation to the core competence required for the occupation]		
Technical Skills:	[Required technical skills in relation to the core competence of the occupation]		
Employability Attributes:	[Employability attributes in relation to the core competence of the occupation]		
Employment Requirements:			
Education Attainment	[The level of education attainment required for the occupation i.e. the type of qualification: high school certificate, technical diploma, bachelor degree or professional qualification etc.]		
Discipline	[The underlying subject area required for the occupation]		
Professional Certificates or License	[Details of any professional certificates or additional license required by the occupations]		
Experience	[The required level of experience [if any] in years]		
Related Employment Information:			
Related Job Titles:	[Describes other job titles associated with this occupation]		
Industry Group:	[Describes the industry group[s]/sector that the occupation is commonly associated with.]		
Skill Level:	[Represents the related skill level as a numeric value]		

Indicative Salaries:	[Provides an indicative salary range for the occupation]
Occupation Prospects:	[Reflects the job prospects as Excellent, Very Good, or Good]

Annex B : Mohre Information Technology requirements for infrastructure hosting and design

About MoHRE Cloud environment

Currently, MoHRE is in the process of migrating its environment into FedNet v2.0 (TRA federal Cloud environment). FEDnet 2.0 provides IaaS services. The Cloud environment is based on VMware vCloud Director solutions and products including:

- vCloud Director
- vSAN
- vCenter
- vSphere

The vendor's proposed solution should be fully compliant with the FEDNet v2.0 specifications.

All infrastructure requirements, estimates, sizing, and corresponding assumptions shall be supplied by the vendor.

All questions and queries in respect of FEDnet components, specification, security, environment requirements, compliance and availability dates, should be referred in the first instance to Telecommunication Regulatory Authority (TRA) or via https://www.tra.gov.ae/en/home.aspx

Design principles

The following design principles shall be applicable to the proposed IT infrastructure target architecture developed by the vendor on top of Cloud environment:

- RESILIENCY. A resilient IT infrastructure design enables availability of IT Services and data. The resiliency should be applied across the overall design, individual components and sub-components of the IT infrastructure.
- MODULARITY. Modular infrastructure is key to build a scalable and cost optimized infrastructure. Solution should exercise modularity across components.
- SCALABILITY. Scalability establishes a capability in the solution and underlying infrastructure to grow on demand and enforces a selection and implementation of modular infrastructure both at component and sub component levels. This enables to invest as per growth.
- STANDARDIZATION. Technology standardization is a highly adopted trend and should be enabled to reduce complexities which could impact costs, operations and services delivered.
- SECURITY. Security establish a capability to enforce the control requirements for the confidentiality, integrity and availability of information and associated

systems/components for each service. Vendor shall demonstrate how solution addresses common NESA and ISO27K requirements.

Infrastructure requirements and Cloud-readiness:

The solution should comply with the following infrastructure and scalability requirements:

Infrastructure

Category	Requirement	Compliance
Portability	The system must allow easy transition from "on premise" solution to Cloud based hosting, i.e.FedNet. Transition should eliminate applications re-engineering and implementation of the applications architectural changes.	(Non-compliant/Partial/Full)
Design	The solution should be fully virtualized, including primary, support and infrastructure services. Any exception components, platform compatibility limitations are to be explicitly mentioned and provided with rational.	(Non-compliant/Partial/Full)
Design	The solution should eliminate any dependency on the underlying OS features (e.g. Windows clustering), hardcoded IP addressing, or hardware.	(Non-compliant/Partial/Full)
Design	The solution shall have flexibility to use be deployed on database technology of Ministry's choice.	(Non-compliant/Partial/Full)
Design	The solution should be compliant with design principles identified as part of this RFP section	(Non-compliant/Partial/Full)

Scalability

Category	Requirement	Compliance
Design	The solution and its components must fully support and planned to be explicitly configured for stateless architecture to enable on-demand scalability and elasticity	(Non-compliant/Partial/Full)

Security

Category	Requirement	Compliance
Design	The solution design should adhere to defense in depth principle. Corresponding design patterns and design decisions shall be provided to support this requirement.	(Non-compliant/Partial/Full)
Design	The solution should have corresponding security architecture that describes typical security threats and identify all participating components of the solution that ensure security of the overall solution.	(Non-compliant/Partial/Full)
Design	The bidders should explicitly mention any assumed (e.g. existing) or planned reliance of the solution on the third-party security components.	(Non-compliant/Partial/Full)
Access control	The solution must provide a fine grained access control capability that allows user permission hierarchy and levels to be setup (role level; limited access to specific functions / workflows; ability to limit read, write, update or delete capabilities)	(Non-compliant/Partial/Full)

Access control	The solution must provide a fine grained access control for data level access. The solution should support defining of multiple classification levels and map the level against case attributes and fields (based on data fields, case types, or other controls that can be customized by the Security Administrator). The solution can then restrict access to entire cases or partial case data depending on user hierarchy/role, access.	(Non-compliant/Partial/Full)
Access control	The solution must give ability to apply role-based access controls to allow for the proper designation of administrative and user roles	(Non-compliant/Partial/Full)
Access control	The solution must provide centralized management of access control or decentralized if needed in the future.	(Non-compliant/Partial/Full)
Access control	The solution must allow security administrator to reset password for subsequent change by user.	(Non-compliant/Partial/Full)
Access control	The solution must allow automated user password reset based on correct answers to pre-defined security questions.	(Non-compliant/Partial/Full)
Access control	The solution must allow a security administrator to suspend or deactivate a user-Id from further use as opposed to delete.	(Non-compliant/Partial/Full)
Access control	The solution must allow a security administrator to add and modify user security information using online screens with immediate profile update.	(Non-compliant/Partial/Full)
Access control	The solution must allow a security administrator to review and report on attempted violations by batch report or online.	(Non-compliant/Partial/Full)
Access control	The solution must record who changed security profiles and when changes are made (user name, date and time stamp).	(Non-compliant/Partial/Full)
Authentication	The solution must provide the ability to support configurable soft and hard multi factor authentication (MFA)	(Non-compliant/Partial/Full)
Authentication	The solution must give ability to use MoHRE UserID e.g. employee id or 7 alpha characters.	(Non-compliant/Partial/Full)
Authentication	The solution must enable implementation of a data privacy policy leveraging the fine grained access control for data level and the role-based access controls capabilities in the system.	(Non-compliant/Partial/Full)
Compliance	The solution must support industry standard TLS, SSL, SSH, HTTPS Secure Encryption.	(Non-compliant/Partial/Full)
Compliance	The solution must be in compliance with all local and national security standards including all applicable NESA and ADSSSA standards	(Non-compliant/Partial/Full)
Audit	The solution should have out of the box capability to record and trace all end-user and administrator sessions.	(Non-compliant/Partial/Full)

System management

Category	Requirement	Compliance
Backup and archiving	The solution must adhere to UAE government data/records retention requirements	(Non-compliant/Partial/Full)
Deployment	The solution should have out of the box capability to perform automated deployments of the customizations, configurations as part of the ongoing management.	(Non-compliant/Partial/Full)

Monitoring	The solution should support monitoring capability that allows user experience monitoring and transaction response time.	(Non-compliant/Partial/Full)

Integration

Category	Requirement	Compliance
Design	The solution must refer to other systems through the use of Middleware. Ministry currently has middleware solution that can be leveraged.	(Non-compliant/Partial/Full)
Design	All APIs must be fully documented describing their usage, inputs, outputs, technology, protocols and positive/negative flow behavior.	(Non-compliant/Partial/Full)
Design	The solution APIs must support synchronous and asynchronous interactions as required	(Non-compliant/Partial/Full)
Design	The solution should support the management and monitoring of all APIs to facilitate troubleshooting and tracing needs.	(Non-compliant/Partial/Full)
Design	The solution must use industry standards to authenticate and authorize web service requests. Usage of Ministries' IDAM system and Active Directory is possible.	(Non-compliant/Partial/Full)

Cloud readiness

Category	Requirement	Compliance
Stateless	Application code should not be planned directly for a specific technology. For example, consist of any embedded IP addresses into the build/deployment packages. Keep application from being affected by dynamic scaling. Application to be as generic and stateless as possible. If you must use a singleton, enable a voting protocol so that the remaining nodes recreate a singleton if the singleton dies. Also, keep a permanent backup of the singleton's state in a shared repository, such as a database.	(Non-compliant/Partial/Full)
File system	Application should not assume that local file system is permanent. Limit use of local file system as a store for temporary information, put temporary information in a remote store such as an SQL or NoSQL database. Be aware that reading static information from a file system is fine. For example, your application can read a configuration or properties file if each node has the same files in the same, or an equivalent, directory structure. Writing unique files to the file system gets you into trouble. This also includes log files.	(Non-compliant/Partial/Full)
Stateless	Application should not keep session state in application itself. If you can't eliminate session state entirely, the best practice is to push it out to a highly available store that is external to application server; that is, put it in a distributed caching store or in an external database.	(Non-compliant/Partial/Full)
Infrastructure dependencies	Avoid any infrastructure dependency. Applications need to be more resilient in a cloud environment, they should be agnostic to any infrastructure dependency. For example, clustering. A better approach is to consult an external service registry to resolve service endpoints, or delegate the entire routing function to a service bus / middleware or a load balancer with a virtual name.	(Non-compliant/Partial/Full)

Infrastructure dependencies	Application should not use infrastructure APIs from within. Avoid making assumptions about the infrastructure that your application runs on, it makes changing that infrastructure more challenging. Think about why application code is calling an infrastructure service or API. Consider other options of obstructing this, using some other layer or relying on the middleware.	(Non-compliant/Partial/Full)
Integration protocols	Avoid obscure protocols and standardise on middleware. Moving to an HTTP-based infrastructure based on such standards as REST makes it easier to port your system to an environment. It will also enable additional business opportunities that are provided by API management and Middleware. Ministry has middleware setup that can be leveraged for integration purposed that supports REST API calls.	(Non-compliant/Partial/Full)
Infrastructure dependencies	Avoid reliance on OS-specific features. Avoid the OS-specific dependencies as much as you can, and rely instead on services that are provided by middleware infrastructure. Any OS-specific features and dependencies shall be explained and presented as part of the solution.	(Non-compliant/Partial/Full)
Automated deployment	Solution should have a capability to capture and provide application installation as a set of operating-system-level scripts. Vendor would be expected to roll-out production environment zero-touch and rely on bash, shell and other scripts to demonstrate this capability. Associated scripts are to be provided to the Ministry. It is preferred that non-production environments follow the same approach.	(Non-compliant/Partial/Full)

Outputs

The vendor shall provide Ministry with the following outputs:

- Explicit confirmation of compliance to each of the above requirements and design principles. Response should include all corresponding assumptions, references to documents, and explain reasons behind response.
- High-level infrastructure design for the solution demonstrating adherence to the principles and requirements discussed above
- Database requirements
- Infrastructure capacity requirements for the solution along with corresponding assumptions
- Other supporting documents requested above