

Diagnostic of the Technological Needs of MEF and OMRH for Strengthening of Human Resources Processes – Innovation in Citizen Services Division

Acronyms and definition

BRH	Haitian Republic Bank
DPC	Direcion of Civil Pension
DRH	Human resources Direction
DSI	Direction Information System
HRMS	Human resources Management System
IDB	American International Development Bank
IFMIS	Integrated Financial management and Information System
IT	Information Technology
MEF	Ministry of Economy and Finance
OMRH	Office of Management and Human resources
SIGRH	Integrated System of Human resources management
SYSDEP	System Managing Expenses
SYSPAY	System Managing Payroll
SYSPENS	Information Technology

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1. BACKGROUND INFORMATION

In the case of Haiti, poor governance and institutions' weaknesses are major impediments to Haiti's sustainable development leading to disincentives to economic activity and vulnerability to shocks. In that context, the country is considered among most fragile states and can only experience modest projection growth rates with low ranking in several governance and institutional indicators. Concerning government effectiveness, Haiti is placed in the worst position in the world, only surpassed by South Sudan and Somalia.

The poor delivery of civil services is a direct consequence of the weaknesses of the Institutions in Haiti; a situation further characterized among other things by capacity gaps, noncompetitive salaries and non-effective staff distribution within the agencies. The recent creation of a new government office, OMRH, with the goal to coordinate modernization effort is also facing own weaknesses and lack of systems. The financial information flow is not adequate because of a fragmented structure and this is shown in difficulties to properly follow budget expenditures according to planning due to impossibility for timely transfer of information from local ministries to the body of management, the MEF.

In that context strengthening the HR processes and promoting smooth financial information flow represent key drivers to fast track the modernization project of the Public Administration of Haiti. The goal of this consultancy is to diagnose the technological needs of the Ministry of Finance (MEF) and OMRH to sustain the implementation of human resources and information management systems to help improving the management of information between both entities in such a way to provide a good foundation to advance the modernization effort and attain effectiveness in public service delivery.

2. INTRODUCTION AND OBJECTIVES

2.1 INTRODUCTION

Strengthening the human resources processes is a strategic management restructuring effort leading to a qualitative transformation of inputs, outputs and structures of the State Administration in Haiti to improve the delivery of public civil services. In modern management, Information Technology is a key innovating agent with a leading role to sustain such effort to meet the requirement of effectiveness (doing the right thing) and efficiency (doing things right). The strengthening effort using Information technology as the main driving factor is being concretized through two main projects: the installation of an integrated financial management system at the Ministry of Finance (MEF) and the implementation of an integrated Human resources management system at OMRH, the leading entity coordinating the modernization project of the State Administration of Haiti. The new management system on top of modernizing the HR processes will be enhanced with the integration with the financial system to exchange financial related data and ensure by then the improvement of information flow.

2.2 Objectives

This document will aim at diagnosing the technological needs for both MEF and OMRH to achieve such integration. We understand the technological requirements in the global sense that include data process models, network and software to facilitate the interoperability of both systems. A summary of our objectives consists in analyzing existing implementation, determine the related technical issues and process deficiencies, establish the theoretical framework of the integrated HRMS to enable the goal of strengthening HR management capabilities, determine points of integration with financial system to finally establish technological needs and recommendations in that context.

2.3 Methodology

Our approach for diagnosis the technological requirements is based on a theoretical model of IT management presented in section 7. It will serve as a benchmark to evaluate the existing IT infrastructure of OMRH and derive the needs. Also, for the interconnection of both systems, we also consider a theoretical model that needs to be in place and the diagnosis with associated needs use that model as a reference point. The diagnosis of MEF IT infrastructure is done in major part within the context of the integration of IFMIS and the HR management system. Overall, the methodology used, and related development pattern aim at addressing the questions below:

- What is current operational framework for HR processes within the Public Administration?
- What are the deficiencies of processes and systems that implement them?
- How future implementation of IFMIS leads to opportunity to improve HR processes and establish a new integrated HRMS?
- What are the points of integration between the IHRMS and IFMIS?
- What is the new Integration System Architecture requirement?
- What are the gaps in current IT architecture both at MEF and OMRH to implement the Architecture?

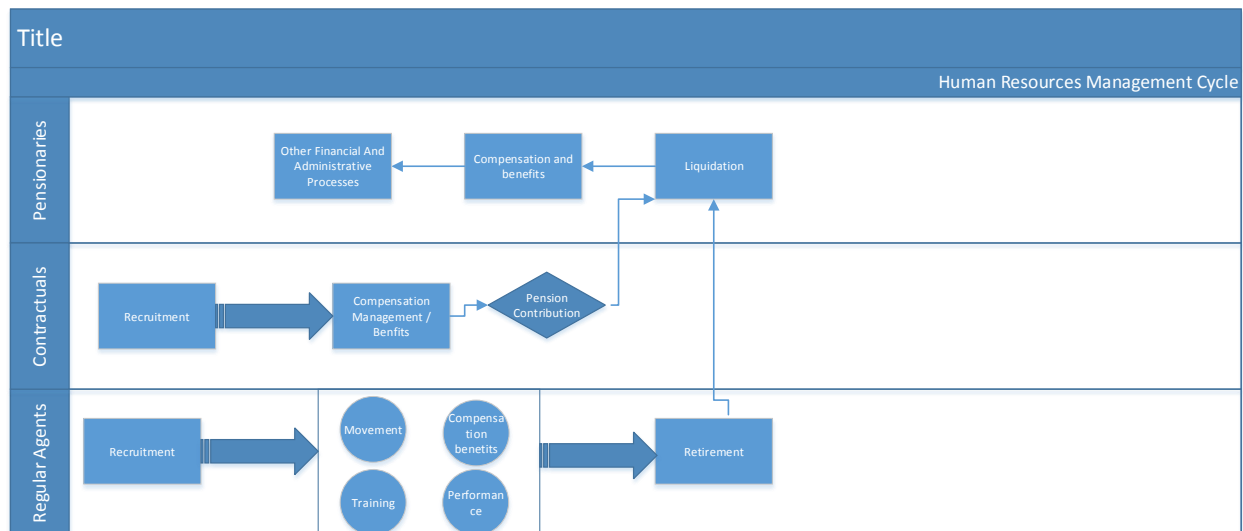
- What are then the technological needs and recommendations based on identified Gaps?

3. HR Processes implementation

3.1 Description of HR processes

This section is intending to provide a general overview of the HR processes within the public Administration in Haiti. It starts with a high-level diagram of the business data models including the principal actors. The main processes are described afterwards to provide a more detailed understanding

The diagram below provides a snapshot of the processes and the beneficiaries involved.



The working population of the Public administration in Haiti includes regular agent representing the major part, and contractors. We also have the pensionaries, accounting for about 10% of the staff. The HR processes implemented for the permanent agents include mainly: recruitment, the management of employee internal movements, compensation and benefits, performance and retirement. For the contractors, the processes include recruitment and payroll. For retired personnel, the services provided are liquidation or the process of validating the right to cash the contributed funds, the payment and other benefits including health insurance.

The HR process are being executed by the following entities: local ministries, Ministry of Finance and Direction of Civil Pension. The ministries manage in general their own recruitment process which includes the appointment of a personnel, the validation to the office of the Prime Minister, the validation in Finance against budget and other related procedures before final integration into the main payment database. The ministries also execute the operational activities that include employee movement, administrative tasks and retirement control. The MEF is responsible for the payment of salaries and related benefits. The Direction of Civil pension is responsible of managing the affairs related to pensionaries as stated above.

3.2 Summary of processes

3.2.1 Recruitment process

As stated above, the recruitment process is performed by the human resources direction of each ministry and other public institutions. After launching the preselection procedures, the selected candidate paperwork is prepared and submitted to the office of the Prime Minister for validation. The paperwork is then sent to the Ministry of Finance where the Budget direction will check fund availability with the control to ensure procedures have been followed before integrating into the payment database.

3.2.2 The Payroll processes

The payroll processes are initiated by the Ministry of Finance (MEF) at each month by the 15th. It starts with the financial controller for budget control using the system Syspay and then submits to the Department of Solde for validation. At that stage, the local DRH was supposed to submit all the movements impacting the payroll but due to non-timely transfer of information and the requirement to complete payroll on time, Finance proceeds to validation using prior data with the risk of not considering the latest movements. Once payroll is validated, a payment requisition is sent to be processed in the system SysDEP. Once processed, the payment is transmitted to treasury department for accounting entries and check printing or wire transfer. Check printing is done at the office of Budget control. The payroll is then transmitted to BRH to debit State related accounts and check transmitted to delegation department for final release to employee agent. The monthly payroll concerns only regular employees and pensionaries and due to lack of control procedures, payroll of contractors is not regular.

3.2.3 Liquidation

This process is to validate the payment of collected contribution to pension funds. It is initiated by the retired employee who presents the required documentation to the liquidation department inside the Direction of Civil Pension. The documents are then submitted to treasury department for validation. Once validated, the request is sent to the Director for signature and then a notification is sent to the office of the President for publication in State Journal, le Moniteur and the data is recorded in the system SYSPENS. A final notice is sent to budget department for updating the payroll database.

4. IT Systems Involved in HR Processes

The purpose of this section is to enumerate the IT systems supporting the processes described previously. The idea is to present the IT operational framework that will be further analyzed with the perspective of improving the business process models. Presenting the user matrix for these systems will further provide the necessary background information for our diagnosis.

4.1 System Enumeration and description

The following systems are involved to support the implemented processes: SysPAY, SysDEP, SYSCONT, SYSPENS, GL, SYSCHECK, BCC

System	Location	Description
SysPAY	MEF	System where the payroll is initiated by the financial controller. It includes interfaces for budget control as well as the database with the agent information.
SysDEP	MEF	That is the system managing the expenses for the public Administration. The process starts with a request from the system SysPAY and allows electronic validation before issuing checks or transfer request.
SYSCONT	MEF	Manage payroll concerning non-permanent public agents.
SYSPENS	DPC	SYSPENS is the system in use at the Direction of Civil Pension that records new validated pensionaries. It records the data for the retired personnel and issues automatically a unique identifier code for the beneficiary.
GL	MEF	GL is a GL accounting system allowing the recording of entries in appropriate accounts. It is used within the treasury department by dedicated accountant.
SYSCHECK	MEF	Syscheck is responsible to manage the printing of checks and it is used following validation of payroll within the GL.
BCC	BRH	This is the system controlled by BRH responsible to receive the payment information related to the payroll. The transfer of information is done via file transfer initiated by the DSI of the MEF. Upon receiving of the information, there is integration and then execution of payment.

The systems are primarily hosted within the data center of the MEF, the BRH and DPC. The other entities like the DRH and OMRH do not host any system within the current implementation.

4.2 Support IT Systems access matrix

The table below provides the matrix related to user accesses to IT support systems for HR Processes:

	SYSPAY	SYSDEP	GL	SYSCHECK	SYSPENS	BCC
DRH						
OMRH						
IT-MEF				X		
SOLDE	X	X				
BCB		X				
FC		X				
BRH-IT						X
Accountant			X			
DPC					X	

The matrix above informs that there exist some automated processes inside the MEF, BRH and DPC. They are not however integrated, and information is being duplicated with potential delays in service delivery. The local Direction of human resources and OMRH do not have a system to handle their internal processes; they rely mainly on manual operations.

5. Analysis of HR process implementation

Above sections were necessary to establish the basis for the analysis of the human resources processes currently implemented. For that purpose, we start with a review using a three-tier model related to the operational, tactical and strategic aspects of management. That approach will provide the necessary clarity to identify weaknesses and possible areas of improvement. It is to evaluate alignment with a holistic perspective of management targeting the achievement of objectives of providing better civil services. We further identify potential risks from a global perspective as well as those associated with each critical process. This will also help establishing the framework for system improvement. The process implementation matrix provides a visual mapping including the list of processes and their automation status, establishing then the level of systematization in place.

5.1 Process review

At the onset, we observe that the implemented processes concern only the operational aspect of the HR management. The tactical processes and strategic processes are not really implemented. Also, the processes do not integrate all aspects of the operation for example, there are separate processes for contractor's payroll and the delivery of that service is not done regularly. The information flow between the different systems are scattered because of lack of integration. There is risk for information to lose their nature when being duplicated from one system to the other and this will also affect the integrity of the information. There is serious delay in delivery of services because critical operations are being done manually.

5.1.1 Risks associated with the processes

Generally, most processes implemented have deficiencies regarding data integrity because of fragmentations of the systems involved, and lack of process standardization. This poses serious integrity issues regarding information flow adding to that the lack of auditing and control mechanisms. The paragraphs below provide a summary of key risks identified for critical processes.

For the recruitment process, the main risk identified relates to information integrity as there is no formalized method of validating data against initial requirements. Also, budget verification not initiated early in the process may lead to scenarios where hiring is authorized outside of budgeted provision.

The liquidation presents the risk that the concerned organization unit (DPC) relies totally on external agencies without being able to cross reference and validate the information provided. The current processes lead to serious delays particularly in validating the eligibility of an agent to receive his or her contribution to the pension funds.

Concerning the payroll process, the major risks are as follows:

- The validation process does not consider the most recent movements of the personnel and in that context, payment may be done incorrectly with the risk of issuing check to person no longer active within the Administration.

5.1.2 Information System review

Only the financial processes are automated, but the systems are not integrated. SYSPAY does not talk directly to SYSDEP and there is not integration with the system BCC hosted and managed by BRH. Also, SYSPENS is not integrated with neither SYSPAY nor SYSDEP and consequently information may exist in a duplicated format in both systems with no communication back and forth in case of update. Between the MEF and BRH, the payment information is transmitted through text file with risk of altering initial information so that data received by BRH may not be conform to original one. The GL system has no connection with SYSDEP and then, the user needs to reinter the data for accounting entries with the same risk of data integrity. Our analysis is not exhaustive and is done in the context of information management as they apply to the HR processes improvement.

5.1.3 Matrix of process implementation

	Recruitment		Career Management		Compensation and Benefits		Retirement
Operational	Search and Selection	Approbation	Movement		Validation	Budget Control	Liquidation
	Budget Control		Training and Development		Financial Control		Compensation & Benefits
			Performance Management	Attendance	Payment Processing	Payment Reception	Financial Services
Tactical	Labor Cost Analysis and Budgeting		Training Effectiveness		Compensation Effectiveness Benefit Analysis		Cotisation Monitoring and control
	Turn Over Analysis		Career Matching		Career Matching		Control Receivables
STRATEGIC	Personnel Planning		Contract Costing		Compensation Effectiveness Benefit Analysis		Pensionaries population ForeCasting
	Tracking of Overall market		Salary Forecasting		Career Matching		Financial projection and management

Not Implemented
Not Covered
Covered

As shown in the matrix above, tactical and strategic processes are not implemented within the Public Administration. The operational processes implemented do not have IT support systems. Overall, information technology plays a very thin role in supporting the HR processes.

The operational framework of the HR processes in the Public Administration in Haiti includes scattered manual processes with very little use of information technology. It suffers major deficiencies and risks regarding information management including: data integrity loss, delay in service delivery, payroll executed without latest employee movement, absence of attendance

control system, weak system of identification during check payment. In conclusion, the operational framework as currently designed and implemented is not appropriate to support and sustain the modernization and it requires effort to align it with the goals.

6. Improving HR processes

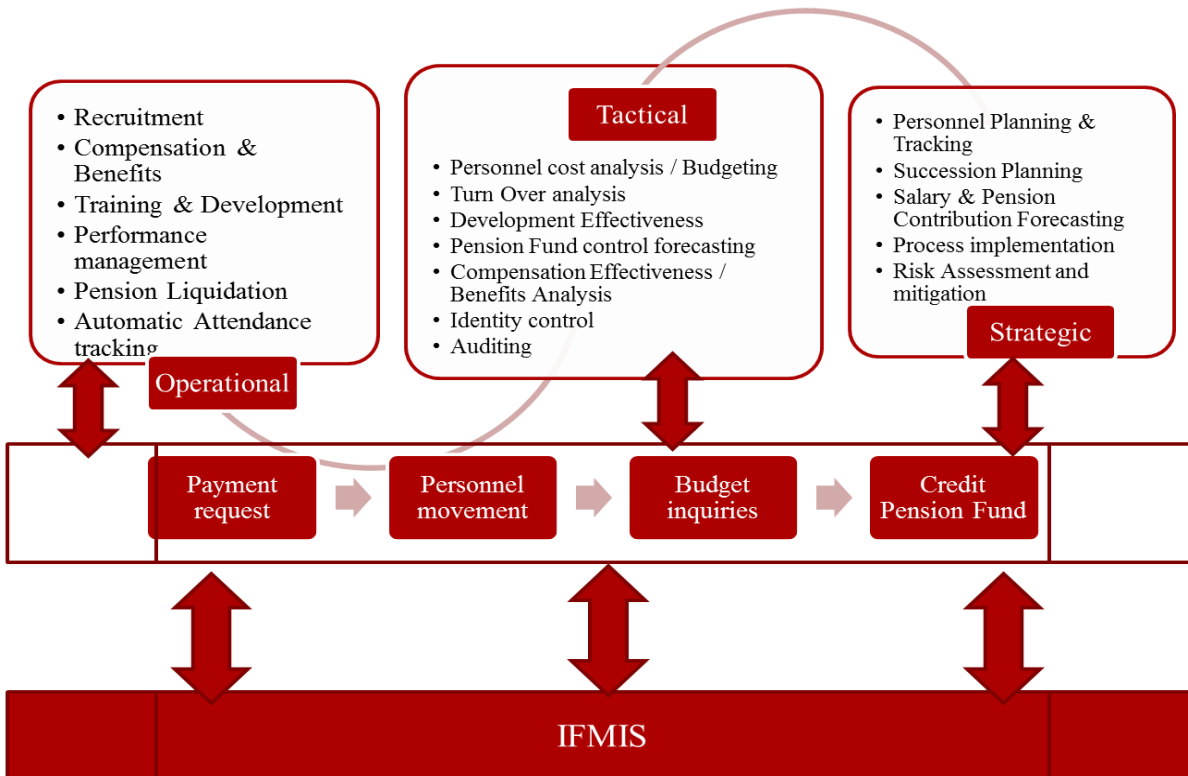
This section lays the ground to achieve the improvement goals of HR processes by first defining the context within which it can be done as well as enumerating what needs to be implemented for that effect. The analysis is provided from a high-level perspective with enough details to derive a path towards a successful initiative. The key aspect we would like to emphasize is the need for integration with financial system in place with the idea of reducing the risk of data integrity loss.

As stated in our introduction, the improvement of HR processes needs to implement two main objectives: efficiency and effectiveness in the information management framework. The aim is that with better information flow and control, the foundation can be laid out for significant improvement in the civil service delivery. To achieve them, it is necessary that Information technology plays a leading role as an enabler of change. In that context, the implementation of a Human resources management system is a major step towards the improvement of the HR processes. This system needs to be integrated with the financial management system to resolve issues of duplicated data as well as risks associated with payroll not taking personnel movement into account. Within the MEF, there is already a project to implement an integrated management system that will address deficiencies identified at that level of operation. To further complete the improvement, the integration of both systems is a requirement to enhance data integrity and security as well as speeding up service delivery.

6.1 Overall requirement for the integrated HRMS

To achieve the goal of effectiveness and efficiency of the HR processes, the HRMS implementation needs to function at all levels of management: operational, tactical and strategic. The figure below provides a description of the HR management system.

IHRMS Description



Operational Functions from recruiting to retirement, including but not limited to:

- Career management
 - Recruitment / Work Force planning and scheduling
 - Skill assessment / Performance Evaluation
 - Employee Movement including salary increase
 - Career Development / Training program coordination and follow up
 - Manage contractual personnel
 - Administer employee retirement
- Administrative tasks
 - Vacation management
 - Sanction Administration
 - Manage Insurance
- Payroll
 - Process regular Payroll and employee benefits
 - Manage payment for contractual based on contract scheduling
 - Process employee deduction from loan or pension funds or any other deduction
 - Implement Haitian tax calculation
 - Payroll for retired employees
- Biometric attendance module integrated to Payroll System

- Implements HR tactical functions including not limited to:
 - o Labor cost analysis and budgeting / Turnover analysis
 - o Training effectiveness / Career matching
 - o Compensation effectiveness and equity analysis / Benefit analysis
- Implements HR Strategic functions including but not limited to:
 - o Labor Force management: planning and tracking
 - o Succession planning Performance appraisal planning
 - o Contract costing / Salary forecasting

6.2 Business process models for Integration with IFMIS

6.2.1 Target Information flow for transactions

In a business to business (B2B) transaction model, the target information flow takes into consideration aspects of security and the need to ensure data integrity is met within both systems. It will be built around an information management model whereby data owned by one can't be modified directly by the other. Any change from one system to the other should follow a set of rules and procedures for controls and audits. The ground rule is the following: IFMIS owns all financial related data including payment, budget, etc.; the HRMS owns information pertaining to personnel management as well as payroll data. There will be no direct exchange between both systems but, it will be done through a middle platform implementing all the inter-communication interfaces and rules. This is done so to protect integrity of information and to ensure there is a traceability to implement auditing requirements. The interconnection platform will act as a gateway between both platforms.

For Business to client model, the same information flow will also be applied for users trying to access the system externally from the local Human resources direction. Initially, there will be a request for information transfer from an external user either via the web or a private connection and the data transmitted will need to be validated inside the SIGRH, so it can finally hit the database. This is done to avoid security compromised situations at other sites to be able to alter data within the SIGRH. Therefore, the model will be for an end user to send a data to SIGRH via the interchange platform, which then will send a validation request to concerned parties and once validated the request is executed and notification sent to user. It is recommended a web-based architecture for the transfer of information between a client and the Human resource management system to minimize amount of data transferred over the private network or virtual private network using the Internet. All transactions from clients to the HRMS need to be transited via the UXP platform using the information flow model described above.

6.2.2 Hosting requirements of the integrated HR Management System

It is recommended for scalability and simplicity of management that the system be hosted on a converged platform instead of having multiple physical servers. The converged platform provides a structure where multiple virtual servers can be defined on the same hardware allowing for cost saving, reduction in system administration complexity and great scalability. The network environment of the hosting entity must be well organized in terms of multiple redundant and

interdependent layers providing specific services including core, distribution and access. This will help maintaining data integrity and security required to ensure continuous operation of the application. The power environment needs to be up to a standard of a Tier 2 environment including two independent power sources with automatic transfer switches, Inverter with a 24-hour autonomy and UPS to provide at least 2 hours of up time after inverter goes down. The idea is to be able to have 24x7 availability of power in a secure manner. Data Center or server room access must be secured and controlled via unique identifier system, preferably biometric with regular auditing. Also, environment must have monitoring system for environment parameters such as temperature, power, etc. as well for network and application key performances with alarm system setup in case of critical data points are reached and related intervention team to resolve identified issues. The environment must have 24x7 redundant and high-speed Internet services available (at least 20Mbps) to allow continuous access to the system.

6.3 Hosting and ownership considerations

The ownership of the Integrated Human resources management system aka SIGRH resides with OMRH because of its legal mandate as coordinator of human resources management. It represents the entity that should legally provide HR services across the entire public administration. Another reason also relates to its strategic and tactical role in the HR processes. Regarding hosting, it is only a technical issue and not a determined one as ultimately, wherever it is physically installed, it is a matter of providing access to the system administrators and establishing reliable access links so concerned entities can access according to their rights and permissions. In that case, hosting the SIGRH within OMRH or MEF is not really the main issue and what is important is what makes more sense financially, technically and long-term planning. In another section, we will analyze two options that will help IDB and the concerned parties to make the appropriate decision in that regard: one where it will be hosted in OMRH, one where it will be hosted in MEF. One option out of the scope of this project would be to consider the building of a centralized data center infrastructure to be shared across the entire Public Administration.

6.3.1 Server hardware requirements

The HRMS platform needs to be able to process transactions internally at high speed with rapid response time in either contexts: Business to Business or Business to client models. Scalability is an important requirement to allow for system upgrade when necessary. It needs to be installed on a converged infrastructure instead of multiple physical server's environment; the goal is to be able to expand the system as needed without adding to administration complexities.

6.3.2 Interconnection requirements

HRMS (ISGRH) will essentially issue order of payment to IFMIS as well as updating IFMIS payment database with addition of public agent, new pensionaries which is a change of status in people's profile, ongoing movement and status being regular or retired. The following data flow is required:

- Transfer of Payment request derived from the Payroll module to IFMIS
- Update IFMIS payment database with employee movement including addition of new agents or canceling payments
- Budget information where by the HR system can validate budget for recruitment or employee increase, etc....

6.4 Review of past implementation of HR Management system at OMRH

For a successful implementation of the new HRMS, a review of past attempts at OMRH to install a similar system will help understanding the critical factors that need to be considered. A brief analysis is given in this section.

The first attempt to install an application to manage HR processes went back to year 2009. The scope of the project was to have a centralized database for the public agents. The local firm Turbo System was selected for the implementation. The system was installed but not widely utilized. Several issues were identified including: user interface not friendly, poor network connectivity, reliance on supplier for any change needed. After the earthquake in 2011 and the damage of OMRH facility, the project discontinued. It is well noted that a few ministries participated in a pilot project to integrate the system which included many HR management features required by the Administration, but the main issues related to lack of ergonomic interfaces, as well as lack of formal commitment to use the system within the public Administration.

The second attempt followed with the new leadership at OMRH and the local firm Solution SA was selected for development and thus, implementation of SIGRH was born with a wider scope. The firm has installed a basic HR management system in the Public Health Ministry and the idea was to expand on that system to benefit the rest of the public Administration. The interfaces were simpler to use but the system had development bugs and suffers from lack of functionalities and therefore, did not meet fully the requirements identified at that time. That project was financed in the context of the IFMS project by the USAID.

The third attempt had two objectives: resolve the development bugs identified with previous SIGRH and secondly, build the interfaces required to interconnect with the MEF payroll system (SYSPAY). An Ukrainian firm was selected with the mandate to improve the system developed by Solution SA using the source codes and at the same time, to build the interfaces to interconnect with SYSPAY. The first objective was met but, the second one could not be completed due to lack of support functionalities. It turned out that to have the interconnection with SYSPAY, other HR modules needed to be developed which was out of scope of the initial engagement. The timing to resolve such issues did not help as the IFMS project financed by USAID came to an end: the project was suspended due to lack of financing support. Presently, there is a system in place at OMRH but not utilized. The SIGRH 2.0 as it is named suffers from lack of functionalities needed to be effective in supporting the requirements identified.

From the three attempts made to install an HR management system at OMRH, several patterns have been identified:

- Customized development was prioritized instead of selecting existing and proven system out of shelf.
- Proper definition of requirements was lacking in all cases and at the end, system revealed to be insufficient which is a typical result where scope of project is not well defined in advance.
- Lack of definition of roles and responsibilities regarding implementation lead to a situation where there is no real accountability which is a typical case for failures.

Based on findings above, IDB needs to consider the following to ensure a successful implementation of any HR Management system:

- Prioritize requirement definition is in place prior to system development and implementation.
- Ensure commitment exists at all levels of Public Administration for the utilization of the system and define points of accountability regarding implementation so proper responsibilities can be identified in case of failures. A document detailing that aspect needs to be signed off by all parties.
- Have the commitment of the government in ensuring legal support for required procedures to be in place to enhance the HR processes.
- Prioritize as much as possible the acquisition of an existing and well proven HR system instead of continuing with ad hoc development which can be out of scope of developing entities. This would provide the foundation required to build upon and support continuous customizing effort according to specific needs.

7. Target IT Architecture to support HR processes improvement

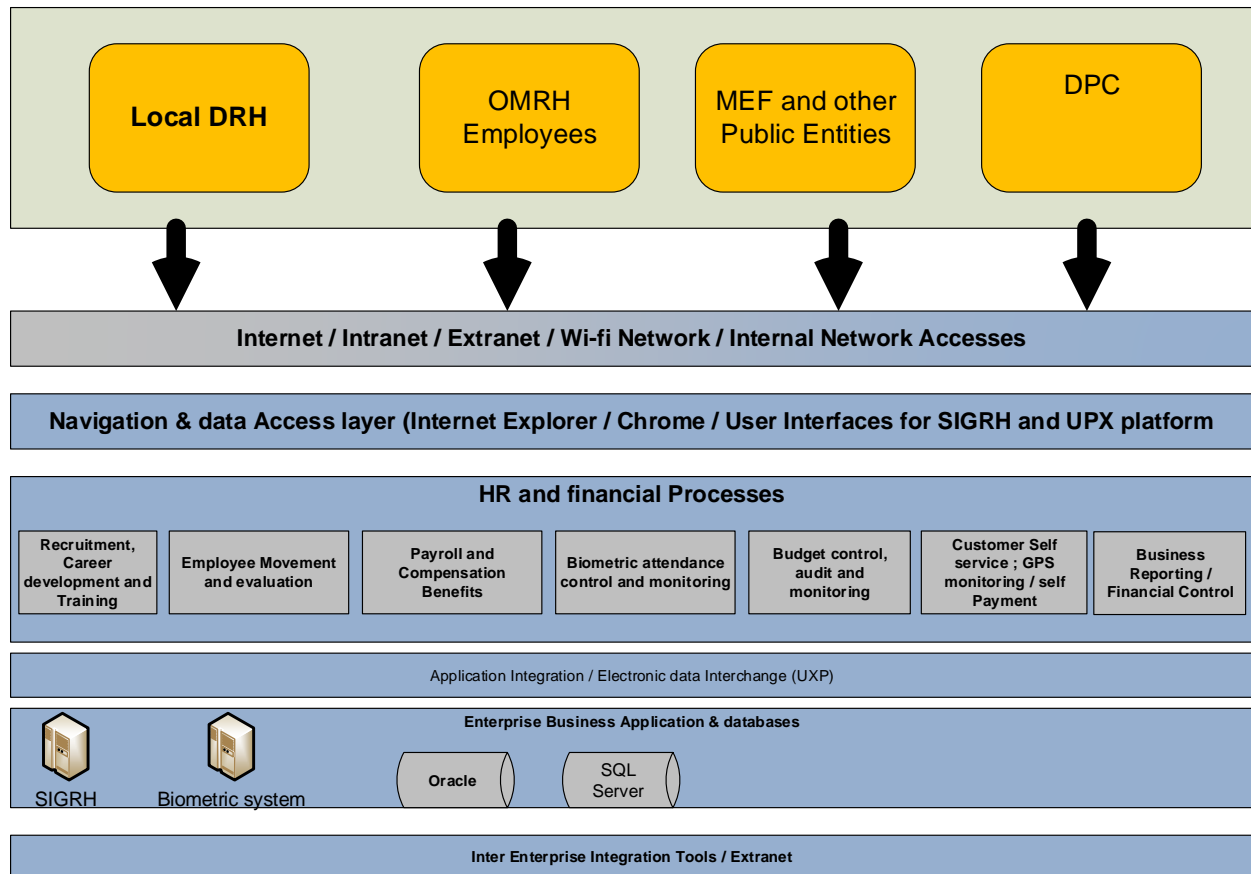
Presenting a target architecture will help providing the theoretical basis to analyze the IT systems in place to support the HR processes in the Public Administration in Haiti. The goal is to compare the existing IT operational framework with our ideal model so what we have a good basis to establish the technological needs. We prioritize a multi-layered architecture that provides clarity in understanding the operation and because also, it provides a simple path for growth and control. We will emphasize our analysis on OMRH because its current level of operation is low compared to the MEF where a foundation exists already. That foundation will then be evaluated from the perspective of supporting the integration of financial systems with the human resources management system.

The target architecture is considered at two levels: one will be to define the IT infrastructure for OMRH and the second will look at the integration framework itself. We have used that approach given the fact OMRH is having a centralized role as Human resources management as well as being the coordinator of the overall modernization of the Public State. In that context, we need to ensure that the overall IT implementation in OMRH will be able to support the requirements as per its legal mandate.

7.1 Target OMRH IT Architecture

To be able to deliver services according to the legal mandate, OMRH needs a solid implementation of Information technology infrastructure. The target architecture is conceived with emphasis on the functional roadmap of OMRH as the centralized driver in the modernization effort of the public sector of Haiti. It is a multitiered and integrated component architecture that will deliver product value to different entities of public Administration via the defined organization channels. It will also provide the processes and accounting necessary for control and audit purposes. It is important that IT implementation aligns with OMRH goals to ensure service delivery effectiveness and efficiency which is the operating principles of the modernization effort. Failure to align both will result in deficiencies in civil service deliveries and therefore, not promoting the goal of the project itself. The diagram below provides the blueprint of such integration.

Diagnostic of the Technological Needs of MEF and OMRH



7.2 Description of the Network access layer

The Network access layer is usually associated with those technologies that create the Internet, Intranet, extranet and general access networks. Some of the specifics of that layer include:

- Physical data communications access into and out of OMRH IT infrastructure
- Firewalls and DMZs defining and defending the perimeters of network
- Router, switches and other network devices providing intelligent routing of data in and out
- Network cables, network interface cards, and wireless access units creating the physical topology of the network
- Browsers and other software data access components that control the presentation and physical access logic of desktop and computer units.
- Transparent security via addressing schemes, port IDs and operating system roles and responsibilities.
- The computer units themselves including laptops, desktops and other devices such as tablets, smartphones, etc....

That layer is the glue that holds every component of the Information technology framework together. It must be transparent to the users but without it, each department unit becomes isolated from each other and therefore, the information flow is not facilitated to the point of allowing improvement of service delivery capabilities.

7.3 Description of Distributed data access layer

This layer provides the presentation and common user interfaces which enable navigation and entitlement as well as aspects of globalization, security, workflow, and persistence that are impacted by certain portions of process delivery channels, rules and functional roadmap. It controls the look and feel of what a user sees, the initial navigation whereby she chooses and moves among applications, databases and their presentation. This is where most security access rules are defined and having that layer allows for easy integration of complex applications within the IT framework instead of having to redesign the implementation model.

7.4 Description of the application and database layer

The application layer is where the systems will reside in the architecture. It is the functional and business heart of the system. In the case of OMRH, the integrated human resources management system if hosted there, will be the primary component of that layer which will also include all other systems that implement the business rules, functionalities that are needed to allow the entity to operate according to the strategic functional roadmap. The definition of the business process models drives the configuration of applications that support their implementation. In that case, all HR processes will be the key to implement that layer,

The database layer implements rules that provides solid support to the application layer through mechanisms such as stored procedures, database triggers and all fundamental capabilities of a relational data model. It also includes data warehouses technologies that support the analytical, business intelligence, and knowledge management portions of the architecture. It is where the tools reside to support the strategical planning effort. At that layer, you will find systems like Oracle, SQL server, etc.

7.5 Description of Integration Architecture

The interenterprise integration layer provides other enterprises access to and information flow in and out. Some of the key priorities of this layer include the following:

- Ensure physical separation but not logical insulation from other layers.
- Implements security strategy to isolate and control access from this layer to internal systems
- Use standard interfaces for communication like XML, EDI that do not consume bandwidth.
- Careful planning of the information transfer implementing communication rules, methods and procedures and importantly to ensure traceability and audit trails.
- Flexibility is important to allow for changing requirements as not all entities have the same type of rules.
- There needs to be a clear line of demarcation of between internal systems and processes that feed the integration systems with clear separation and precise transactions tracking incorporated as basic concepts in their development.

The UXP platform is already physically installed in OMRH. The correct implementation of that layer is key to support not only the integration with the financial platform but overall, to operate as a centralized communication platform between all ministries. This will implement the second

aspect of OMRH legal mandate which is the coordination of the modernization effort between state entities. The information flow within the Public Administration process units is a key driving aspect to support the modernization project. It must be done in a controlled manner as to avoid duplication of information and ensure proper ownership as well establishing clear demarcation between entities and ability to visualize and manipulate data. This is also a central piece to support decentralized planning effort such as budgeting and expense controls, etc....

7.6 Target IT Organization

The IT organization needs to be built in a way to support the desired architecture. Choosing the right solution is not an easy task and is an ongoing process. The target structure will take into consideration several aspects. There is first the utility function including aspects like email communications, network access, printing, etc. If those aspects are not met, the organization will be judged based on failure of those services. Therefore, the structure must be able to support multiple tasks successfully and not be like firefighters but must be proactive in addressing issues. The second aspect relates to the type of industry the structure will provide service for. The third aspect relates to the driving impact of the organization in the implementation of operational and strategic planning. The structure must be implemented in a way to be the driver of the innovation projects.

The following key functions are to be implemented:

- Help Desk and support. This department will support the utility functions of the IT infrastructure in ensuring proper operation of emails, network, printing, Internet access. They will ensure regular maintenance of desktops, laptops and other portable devices belonging to the organization portfolio.
- Network Administration and security. This unit will handle the design, configuration, the implementation of network infrastructure in a manner that is congruent with the overall architecture. They will also manage remote accesses via Intranet, manage the security via the implementation on firewalls, antivirus and intrusion detection mechanisms. This unit will also handle telecom systems like IP PBX.
- System administration and application support. This unit is specialized in maintaining proper operation of the server infrastructure that supports the application.
- Database Administration. This function will ensure continuous operation of the database systems with proper maintenance and control procedures in place.
- Software developers : needed to support local basic programming effort as well as managing the development of XML modules for the operation of the UXP platform.
- Project management and quality control. Particularly for the UXP platform, it is necessary that exchange requirements between two Public State entities be well defined to ensure proper implementation. At the end of the implementation, quality control is a key function to ensure implementation follows technical requirements.

Suggested time line to implement target OMRH IT organization

The proposed time line is designed to match the implementation time frame of the new system of management of human resources (SIGRH). The first two years (2019 and 2020) is considered the period of adjustment and restructuration to prepare the organization for the integration of the new system.

Title	HeadCount				
	2019	2020	2021	2022	2023
Seniort Staff (IT Manager)	1	1	1	1	1
Database Administrator	1	1	2	2	2
Network Administrator	1	1	2	2	2
Software developer	2	2	3	3	3
Network Engineer	1	1	1	1	1
Support technician	2	2	2	2	2
	8	8	11	11	11
		Current Staff			

Further, it is highly recommended that the IT organization unit be elevated to the coordination level within OMRH organizational chart, which will provide the type of capacity to act across the entire structure as well as interacting directly with other entities. The current positioning of the IT organization at OMRH very often leaves it outside of major project definition and they are only informed at the end, and more importantly has to fix issues associated with requirement definition and so on... Having IT at the coordination level will help having them involved at the earliest stage of any major process implementation or changes as well as being able to play a strategic and innovating role in allowing OMRH to act as per its mandate. This is key to develop the type of management capability that is needed to enable the State modernization as well making this entity attractive for competent IT resources willing to contribute.

7.7 Target Infrastructure management framework.

The target infrastructure framework is a set of processes and procedures designed to maintain high availability of IT systems. They are oriented to minimize risks associated with the operation and to preserve the achievement of the goal of IT as a process enabler, an innovator of change rather than an isolated group of technicians acting for their sole benefits. The table below provides a list and short description of processes to be in place to ensure successful management of the infrastructure:

Area	Process Name	Description	Benefit
Operation	Asset management	Process of procuring, tracking and disposing of software and hardware component.	Financial accountability
	Capacity Planning	Process of identifying and planning future IT requirements	Cost reduction
	Change Management	Process to execute changes without disruption to IT systems	Minimize system downtime due to errors
	Disaster recovery Planning	Implement IT infrastructure to support business needs before, during and after a disaster.	Ensure service delivery continuity
	High Availability	Process to analyze system's expectation of availability	Manage organization's expectations
	Problem Management	Process to manage service interruption from identification to resolution	Better service delivery
	Security management	Process to evaluate security risks and develop capability to manage them	Secured and controlled IT environment
	Service Level Agreements	Document that defines roles and responsibilities both internally and externally	Accountability is ensured
Development			
	Programming practices	Process of managing application development and implementation	Ensuring requirements are well defined and minimize project failures.
	Project management processes	Process of ensuring projects are executed according to standards in plan in the domain	Minimize project failures and ensure accountability
	Systems development life cycle	Steps to successfully conduct software development project	
Human resources	New HR orientation	Communication about IT policies and related	Ensure successful

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Area	Process Name	Description	Benefit
			integration of IT personnel
	Managing staff performance	Process of providing regular feedback to employees to track alignment and ensure progress	Ensure performance is aligned to business needs.
	Training & Staff Development	Process of ensuring employee has skills required to perform their jobs	Better performance from personnel

8. Diagnosis of OMRH IT systems to support new Architecture

As stated above, the current section is based on theoretical model established in previous one. We start by providing a description of the existing IT implementation which is not a detailed audit but with enough information to understand where the issues are and opportunities for improvement. The diagnosis will be done with in mind the possibility to host the SIGRH or the HRMS and it will look at critical layers of the operation.

8.1 Description of current implementation

8.1.1 IT Infrastructure

The current infrastructure includes a server room and a local area network. The server room dimension is relatively small and currently includes 4 cabinets hosting network equipment, local servers and systems along with internal IP PBX. The network cabling includes 5 patch panels and regular distribution switches with majority of the brand to be NetGear. The main Cisco switch is currently not operational and will need to be replaced. A more detailed view of the server room:

- a dedicated closed cabinet hosting the UXP platform provided by the Mondial Bank.
- dedicated cabinet for current HR management system that includes three servers: one for the database, one for the application and one for backup purposes. Inside the same cabinet, there is also the active directory server that manages all user rights on the network.
- a dedicated cabinet for the network equipment including 5 distribution switches, 5 patch panels, one firewall Fortinet, one router Mikrotik.

The network has a physical capacity of more than 100 ports. There is a 20Mb internet connection provided by Access Haiti. For the UXP platform, a 2Mb connection was provided but discontinued with the end of IFMS project last year. The computer inventory includes 38 desktops and 6 laptops and among them, 3 MacBook. There is an access point on the network installed about 5 years ago. The network has been improved within the IFMS project and has transport capacity of 1gb between network points and the server room, which makes it a category 6 network.

8.1.2 Software description

In terms of desktop related software, Microsoft Office application is installed. Only 10 Antivirus licenses exist for the whole network and it is installed on the firewall device. The SIGRH 2.0 is also installed but not currently used and is implemented on three servers: one database server, one Application server and one acting as data backup. On the server room, it is also hosted the Universal Exchange platform (UXP) provided by Mondial bank with the IFMS project. In terms of security, it is basic including anti-virus located on the firewall not distributed among the PCs.

8.2 Diagnostic of current IT Implementation

The diagnosis will be done essentially using the multi-layered architecture established previously by comparing how each layer is currently implemented. Also, on top of that, we will also look at the current IT organization from the point of view of alignment with the capacity to provide day to day operational services as well supporting the strategic effort required.

Essentially, OMRH has currently a very low-level IT capability that can only operate within the context of ensuring the commodity level of informatics operations. The capability for IT to be an innovative agent to modernize the processes of OMRH is lacking. The current implementation has not been designed with an architecture that relates to the strategic functional roadmap and legal mandate of OMRH. Therefore, it lacks effectiveness and efficiency regarding support of current operational needs and strategic planning. In clear, there is a disconnect between IT framework and OMRH current operation roadmap. The status of current IT implementation is at the commodity level allowing for basic computational tasks but not able to fully integrate the requirements. Let us make the diagnostic regarding the target IT architecture.

8.2.1 Network access layer and physical environment

Concerning the network infrastructure, the physical cabling is acceptable and meets the average standard in the domain in terms of internal data transfer speed. Some improvements can be made particularly in the server room to consolidate cables that have loose connection to the patch panels. The server room is in an area that looks secure with controlled access via biometric system. Regular cleaning is necessary to minimize system interruption due to dust and related.

There is not clear demarcation between external and internal network via the implementation of DMZs and firewall. The firewall device is present but, no security rules are currently implemented. In terms of network organization itself, the converged implementation of core distribution and access layers is not fully implemented. Traffic is not filtered between server and other devices on the network which can expose the server to unsolicited traffic. Network is not fully segmented which increases risk of transfer of vulnerabilities.

The power infrastructure is a weak point of the network. Currently, they have one generator supplying backup power to the building. There is no inverter feeding the server room, on each rack, there exist UPS to feed the rack in case of power failure. It is reported that the power feed from the generator is instable and has damaged many network equipment and PCs already. It is installed an automatic transfer switch allowing transfer from power source to be done automatically. The power infrastructure is designed to provide 24x7 service, but it is not having the required reliability to support continuity of service delivery.

The internet connection bandwidth at 20 Mbps is acceptable to support internal utilization but does not have a backup option. This is the same issue across the network implementation as most of the switches do not have redundancy.

8.2.2 The data access layer

That layer is implemented with very basic solution using regular browsers and because the business processes are not fully automated, there exist very few application interfaces in use. The current SIGRH 2.0 has user interfaces to access the system but, they are not currently used. The active directory server is implemented to control access to the network: it needs to be expanded and fully utilized.

8.2.3 The application and database layers

Implementation is basic at that level with the SIGRH 2.0 and supported Microsoft SQL database. However, It is reported that current implementation is not aligned to OMRH current requirements and not able to support the functional roadmap of the organization unit. It seems the project was not implemented with a full understanding of the functional requirements but was more an ad hoc implementation to supply to immediate operational needs in terms of HR management. The tactical and strategic aspects are not included in current implementation. Essentially, this is a layer poorly implemented and the main issue is the lack of alignment to OMRH needs.

8.3 The interenterprise Integration layer.

This is a layer that is most implemented within OMRH IT environment although not used because communication rules and interfaces not yet defined. It is implemented using UXP platform, Xroad which is the one used in Estonia by the State Administration to exchange data between all State entities and is a well proven system. The current implementation includes 8 servers designed around an architecture that includes data access layer, application and database. It allows for audit trails and traceability. In that context, OMRH has the basic hardware and software needed to provide interoperability between the platforms among the ministries and the public in general. This is a platform that was provided by USAID within the IFMS project. There is a need to define the communication functional roadmap include rules, methods and audit procedures to fully utilize the platform. Only issue with the current implementation is the footprint of the physical server with existence of several points of failure because of the physical server environment. Expanding on the architecture of the system and use it as the main communication interchange backbone among the public administration is key for the modernization project. In terms of building blocks, OMRH will host the main servers with perhaps replication at MEF and will also administer the platform.

8.4 The IT organization

The current IT organization includes one senior staff with 11 years of experience at OMRH supported by two first level technicians. Recently, the most advanced staff have left for other opportunities. The current organization is not suitable to support current operational needs and in clear, there is a lack of staffing to support basic IT utility functions like email, desktop software, Internet and network accesses, etc. Issue resolution is normally delayed in such environment and there is no time for planning at any level of management be it operational, tactical or strategic within the IT organization. It is then an organization that operates like firefighter. It is reported in that context that there is no involvement when it comes to strategic planning and very often, IT is

informed at the implementation time having to fix most of the issues resulting for proper account of requirements.

In that context, basic processes as they related to IT Infrastructure management and execution are lacking including for example: asset management, change management, capacity planning, Disaster recovery planning.

There needs to be a restructuring effort of the IT organization to support the ongoing effort of modernization and this is essential to ensure success of the undertaking.

9. Diagnosis and technological needs for OMRH

The technological needs are considered holistically from three aspects: hardware, processes and the organization to support the implementation. Our goal is to emphasize the fact that IT operational framework not only relates to hardware and software but, it is key that the processes and the organization in place be able to support and operate in a controlled fashion that facilitates control and minimizes risk of disrupting the overall operation of the organization.

The table below provides a summary of the diagnosis and technological needs of OMRH. The first column lists the layer of the architecture; the target column expresses what needs to be in place ideally; the next column relates to existing element in place for that layer; the gap analysis expresses what is not currently implemented compared to the target model; the needs column establishes what needs to be acquired to meet the target model. It is a simple view combining diagnosis and technological needs and provides the reasons behind the technological requirements identified.

Layer	Target	What do they have now?	Gap analysis	Needs
Power Environment	Redundant power Generation	Public utility + 1 Generator 100KW for entire building	Generator Not reliable	1 dedicated generator for server room
	Inverter + Batteries	None		Sine Wave Inverter + 48 batteries
	UPS	Rack UPS	Maintenance required	
	Redundant electrical design	Not documented	Review and evaluate needs	Improve current design
Network Layer	Firewall	1 Firewall unit: Fortinet	Need redundancy and more licenses	- Anti-Virus licenses - Redundant unit
	Router	Mikrotik	No Redundancy	- Redundant router
	Core Switches	None	Only have many switches not organized as layers	- Acquire 2 core switches for redundant architecture
	Distribution Switches	NetGear switches	Complexity in management / not enterprise grade	
	Cabling	Category 6 cabling	Ok for most part	Revise cabling in server room
	Internet Access	20Mbps	No redundancy	Backup 20 Mbps Internet from second provider

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Layer	Target	What do they have now?	Gap analysis	Needs
	Redundant private Intranet with MEF data center for IFMIS interconnection	None	No Private Intranet exists	<ul style="list-style-type: none"> - 10Mbps Fiber Link with MEF data center - Redundant Wireless licensed link with MEF
Application and database Layer	Converged server infrastructure	Fragmented: 3 physical servers	No redundancy, not converged	Converged, redundant, expandable architecture (VxRail)
	Innovative systems in all three layers of HR management	SIGRH 2.0	Not aligned to business needs / specific development	Gather requirements / Install new System supporting target requirements.
	Biometric attendance control System integrated to the HR Management	None	None	Install centralized biometric system to be hosted on VxRail platform or Cisco FlexPod.
Inter-Enterprise communication Layer	Universal Exchange platform	XRoad UXP platform	Can be reused with current hardware in place, although converged environment is preferable.	

10. Diagnosis of MEF IT systems / Analysis of request for Assistance

The diagnosis of MEF IT architecture will not be as exhaustive as the one done in previous section for OMRH. It is because there are ongoing efforts to restructure the current operational framework which is now in a more advanced stage compared to OMRH. Our effort will concentrate primarily on the requirements to integrate with the architecture of OMRH with a review of weaknesses impeding the realization of that goal. Further, our analysis will also take into consideration a request for acquisition of hardware submitted by the DSI of the MEF envisioning a support for internal improvement as well as positioning itself to support the implementation of a new financial management system which is a key initiative to improve the overall capability of service delivery of the MEF in terms of efficiency and effectiveness as well having the foundation for better control.

10.1 General observations

Our general observations are based on review of documentation provided by the DSI and IDB. We have not been able to visit the data center of the MEF and, this is required to confirm some of our observations. The IT management framework is more advanced than OMRH and is currently improving with several initiatives mainly in information security and financial system integration. However, at this stage, it is still lacking the capability needed to fulfill all the requirements of hosting the IFMIS and the HRMS. There have been recent investments in their IT Infrastructure and they have qualified people and good support from international consultants. Key weaknesses identified so far:

- Most systems architecture not redundant
- Private network needs design improvement plus more resources to manage system issues
- Fragmented IT applications (although IFMIS will solve part of the problem)
- Fragmented Server environment (too many physical servers lead to a very complex administration environment)
- Lack of staffing with expertise in key areas like database, security management, web services development, etc....)
- Data center not meeting key International standards.

10.2 Analysis of request for Assistance submitted to IDB

To improve their current infrastructure, the DSI of MEF had submitted a request for assistance. We are analyzing the request within the context of hosting the HR management platform as well as supporting interoperability with the IFMIS. We have also excluded cost associated with operational expenses (OPEX), which would be addressed in other aspects of IDB's assistance.

The table below provides a detailed analysis in the context of eventually hosting the SIGRH and the interconnection with IFMIS:

Diagnostic of the Technological Needs of MEF and OMRH

Item	Description	Is it needed for SIGRH?	Recommendation
Improve MEF MAN/WAN network	Improve transfer of information between MEF organizational units	Partially	
Fiber Interconnection Link between OMRH and MEF	Support data exchange between MEF and OMRH	Needed	
Fiber Interconnection Link between DSI central office and MEF data center	To allow for remote administration of MEF data center	Partially	
Acquisition of Server for UXP platform replication	It is needed to have a replication system for the UXP Platform	Partially	
Acquisition of Servers for UXP platform replication	Servers to be able to connect to UXP platform and exchange data with other systems including the SIGRH	Needed	
Firm for IT maintenance	Hire a local firm to maintain computer infrastructure within the MEF	Not quite required but beneficial	
Renew Anti-Virus contract	To renew licenses for anti-viruses.	Partially	
Training of System Administrators for UXP, database, security and web services	Train technician and engineers for the administration of the UXP platform, databases and security.	Needed particularly for the integration	
Redundancy planning	Project to establish redundancy within the IT infrastructure for continuity of service	Partially required	
Materials for backbone interconnection network implementation	To acquire materials for the interconnection backbone between the entities within the Public Administration	Could help users to have access to SIGRH	Simple data transfer via web interface and XML backend using virtual private Network or SSL connection.
Youth training academy	To train young technicians to technology in use at the MEF: the idea is to develop local resources go administer and operate the systems.	Not needed specifically for this project but beneficial to have trained staff.	

Overall, we have observed that assistance requested by the DSI is not included into a global strategy and aims at addressing short to medium term operational needs and therefore seems not to address fully the strategic requirements.

10.3 Technological needs for the DSI of MEF

The table below provides similar pattern in establishing the needs of the MEF primarily to support interconnection with OMRH systems.

Layer	Target	What do they have now?	Gap analysis	Needs
Power Environment	Generator	1 Generator 100KW for entire building	Not reliable	1 dedicated generator for server room
	Inverter Batteries +	None		Sine Wave Inverter + 48 batteries
	UPS	Rack UPS	Maintenance required	
	Redundant design	Not documented	Review and evaluate needs	Improve current design
Inter-Enterprise communication Layer	Universal Exchange platform designed and developed by X-Road	None	There is no server available at this point to host UXP gateway clients	Need servers to host and implement UXP gateway clients. Use existing converged VXRail platform.

11. Cost to support OMRH and MEF technological needs

11.1 Cost Estimate for OMRH

The table provides a summary of the capital investments needed to implement the technological needs of OMRH excluding at that stage the cost for biometric and HR management systems. It includes then the hardware, network and related support mechanisms required to operate the systems.

Data center + Office equipment + remote users (CAPEX figures)			
Item	Description	Why	Estimate in USD
Power Environment	Generators	1 for OMRH and 2nd as back up, mostly for servers	\$ 125,000
	Inverter + batteries	Sine Wave Inverter + 48 batteries to provide backup power in case generator and main electricity line goes down	\$ 15,000
	Solar Panel	Acquisition of Solar Panel to charge the Inverter batteries	\$ 40,000
	Redundant firewall for data security and antivirus licenses	Anti-Virus licenses & redundant unit	\$ 35,000
Internet	Internet router for redundancy	Redundant router to provide continuous	\$ 3,500
Network Layer	Core Switches to secure network	Acquire 2 Enterprise grade core switches for redundant architecture with fiber connectivity	\$ 75,000
	Distribution Switches	To acquire local network enterprise grade distribution switches with fiber connectivity	\$ 50,000
	Improve Cabling at the server room	Revise cabling in server room	\$ 5,000
	Monitoring software	Have a monitoring system for environment, network and systems	\$ 50,000
Server physical environment	Consolidate	improve current environment following analysis after field visit.	\$ 10,000
Back up system	Centralized Backup System including hardware and software.	To have a centralized backup system for SIGRH, UXP systems.	\$ 50,000
PCs	PCs + Laptops, etc	For Internal Use at OMRH (IT is to improve current PCs, laptops to be compatible with new software, new technology in general)	\$ 100,000
Local servers	Local servers (requested by OMRH for Internal USAGE)	Local servers for Internal IT Usage (For local development needs)	\$ 40,000
Office furniture	Office furniture	For Internal Use at OMRH	\$ 359,000
Audio-Video Conference	Audio-Video Conference System (OMRH Request)	To facilitate communication with external entities and be able to do online meetings, etc...	\$ 25,000
Maintenance	Firm for Maintenance of IT Equipment	Maintenance for IT equipment	\$ 30,000
Other	Other provision	Provision for extra needs as identified	\$ 37,500
Total			\$ 1,050,000

11.2 Cost Estimate for DSI-MEF

The table below provides a summary of the capital investments needed to implement the technological needs of MEF. Our consideration relates to what is needed specifically for the interconnection of the HRMS (SIGRH) and the IFMIS. We have excluded considerations associated with the improvement of current IT infrastructure and organization of the MEF that seem to be part of an ongoing project. That improvement is highly required and IDB needs to support such initiatives conjointly with other financial providers like Mondial Bank and USAID to ensure inclusion of required elements for a successful implementation. We have reviewed the list of requests submitted by the MEF and our cost estimate will be based on that primarily.

Diagnostic of the Technological Needs of MEF and OMRH

Item	Description	Amount	Comments
Improve MEF MAN/WAN network	Improve transfer of information between MEF organizational units	\$ 100,000	
Improve OMRH and DSI/MEF connection	Improve MEF and OMRH connection	\$ 35,000	
Fiber Interconnection Link between DSI central office and MEF data center	To allow for remote administration of MEF data center	\$ 70,000	
Acquisition of Server for UXP platform replication	It is needed to have a replication system for the UXP Platform	\$ 50,000	
Acquisition of Servers for UXP Client connection	Servers to be able to connect to UXP platform and exchange data with other systems including the SIGRH	\$ 50,000	The provision is to upgrade the current VxRail converged platform already installed.
Acquisition des Serveurs d'Hébergements du Domaine mef.gouv.ht et tous les autres Serveurs Proxy et les Serveurs pour héberger les Solutions Help Desk et Monitoring, Installation et Configuration à la DSI/MEF	Hébergement domaine mef.gouv.ht	\$ 30,000	
Firm for maintenance for IT equipment	Maintaining equipment	\$ 45,000	
Renew Anti-Virus contract	To renew licenses for anti-viruses.	\$ 144,000	
Redundancy planning	Project to establish redundancy within the IT infrastructure to ensure continuity of service	\$ 40,000	
Materials for backbone interconnection network implementation	To acquire materials for the interconnection backbone between the entities within the Public Administration	\$ 400,000	
Reinforce power infrastructure and monitoring system	Power infrastructure at the MEF data center hosting the IFMIS and UXP servers will be required	\$ 50,000	
Equipment for DPC/MEF	TBD	\$ 41,000	
Total MEF Equipment		\$1,055,000.00	

12. Human resource Management system (SIGRH) Hosting comparison

In this section, we will analyze the options defined previously regarding hosting of the Human resource management system.

12.1 Hosting in OMRH

The level of IT implementation in its current state at OMRH requires major restructuration to be able to host and manage the Human resource management system. Most of the elements of the IT infrastructure have already been addressed in previous sections. While some of it may be considered optional, it is becoming mandatory for the hosting consideration. On top of the infrastructure, the IT organization needs to be reinforced seriously and positioned at the level of coordination. Historically, the IT department in OMRH has been conceived within the context of managing a centralized HR database with no involvement in strategic management. As we said in our analysis, if OMRH needs to be an essential actor in modernizing the Public Administration, there needs to be in place a strong IT organization that can be involved in all levels of management.

The current weaknesses are identified and need to be resolved for OMRH to be able to host the HRMS:

- Resolve problems with Power environment
- Increase Internet services and install a backup option
- Lack of staff and qualifications to administer the UXP and the SIGRH.
- Improve cabling environment in server room
- Reinforce structure of Server room.

Essentially, all the technological needs identified above need to be implemented to have the SIGRH hosted in OMRH facility. Then it will be a costlier effort but with potentially large return on investment in the medium to long terms, considering the opportunity of significant impact on the overall human resources management framework.

12.2 Hosting in MEF

The hosting in MEF in the immediate term presents the simplest solution as this will allow to take advantage of existing IT environment that is in a more advanced implementation stage than the OMRH. The principal advantage is that the MEF already has an IT organization which can operate at the strategic level of operations as well as multiple server rooms that can be easily transformed into data center with Tier 2 level.

However, on the IT Infrastructure management side, the MEF does not yet have the level of sophistication required to manage a new system as complex and demanding as the SIGRH. The workable model would be for the MEF to physically host the system, but it would be managed by OMRH engineers. In other words, some enhancements are required mainly in adding redundancy in critical aspects of the environment as well as improving the IT management framework.

Summary of benefits of hosting in MEF Server room:

- Minimum of IT infrastructure already existing that can be easily built upon for the hosting
- Staff already accustomed in managing critical systems so some experience is there.

- User data access facilitated via the existing Intranet meaning more entities will be able to access the HR management system particularly the one working for the MEF.

Summary of negative points

- Adding complexities in MEF IT Environment not yet at the level to properly manage the IFMIS. To alleviate that aspect, it can be recommended only a physical hosting that does not imply administration. Otherwise, the DSI of the MEF may not be able to deliver if they were to administer the HRMS.
- The MEF will control a key system of the Public Administration without being legally appointed to do so. Besides that, by controlling the HR management system, there is an issue of separation of duties that will need to be addressed.
- The other disadvantage is that we will lose an opportunity to reinforce the IT infrastructure of OMRH as without the need for hosting, it will be difficult to justify the reinforcement of the IT system, which in the long run will be prejudicial to the development of OMRH capacity to handle its legal mandate.

In conclusion, hosting the SIGRH within the facility of the MEF looks like a better option in the very short term. In that were to be considered, we would recommend that OMRH keeps ownership of the system and that the hosting in that context is only physical whereas administrative duties will be reserved to OMRH DSI. That means essentially, the administration of the system and the ownership of the operation need to reside within OMRH which will need to be reinforced to be able to play that role. The negative effect of hosting the SIGRH within the MEF is mainly the fact that it is against the pattern of what has been done so far considering all implementations of an HR System have been done using OMRH as hosting point and also, it has the risk of retarding any reinforcement effort of the IT infrastructure in OMRH, an effort needed to support that organization in helping the reinforcement of management capabilities.

The table below summarizes the CAPEX requirements on both sides.

Diagnostic of the Technological Needs of MEF and OMRH

Item	Target Requirements	OMRH Gaps	MEF Gaps	Capex OMRH	Capex MEF
Power	Redundant 24x7 power	Power system unstable / generators, inverter, needed	Inverter needed	125,000	25,000
Network	Redundant core network	Core network non-redundant + Distribution Switches	Core network non-redundant	125,000	50,000
Interconnection Link	Fiber primary link + microwave backup option	No link currently exists between both entities	No link currently exists between both entities	35,000	35,000
Servers	Converged server Infrastructure	No hosting infrastructure	No hosting infrastructure	350,000	350,000
Backup System	Backup System	No backup infrastructure	Non existing or basic structure needs to be reinforced	50,000	50,000
			Total CAPEX	685,000	510,000

At a glance, hosting in OMRH in the short term will imply more capital investments. We need also to consider the operating expenses which in the case of OMRH may also be higher because of necessity to improve current communication infrastructure. Overall, the MEF already has infrastructure in place, which may lower the Opex needed for the hosting. If we were to take the time to reinforce OMRH, in the long term, it will be a better option to host the SIGRH at OMRH considering the need to have a well-organized IT department there to make effective the centralized role of OMRH in strengthening the management of Human resources.

People met for this report

Full Name	Organization and Title
Marie Zemyr Georges Jeune	DPC Director
Desir Chrisnel	IT Office OMRH
Christian Poise	Consultant Mondial Bank
Donald Marcelin	MEF-DSI Manager
Alphonse Junior Mettre	MEF – Interim Executive Secretary Finance reform commission
Wesley Saint Pierre	Chemonics Representative / IFMS Project coordinator
Nkunzimana Alphonse	USAID Representative
Wilfrid maxi	Consultant SIGRH 2.0 Implementation
Adonis Joseph	Assistant Director DCB-MEF