Kingdom of Bahrain
Ministry of Health

Health
Information and Communication Technology Strategy

Health Services Without Walls

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accessibility, affordability, appropriateness, accountability, accreditation and acceptability

Background

Kingdom of Bahrain

The Kingdom of Bahrain is a country located in the Arabian Gulf with the Kingdom of Saudi Arabia to the west and Qatar to the east. The total population of Bahrain according to the 2002 census is 672,123 of which 62.4% are Bahraini. The health status of the population of Bahrain has improved dramatically over the last 40 years. There has been a significant decrease in premature death and an increase in life expectancy continues. The size of the Bahraini population aged over 45 has started a rise and is likely to double in 25 years, and quadruple in 50 years. This will generate new demands for health services.

The Healthcare System

The Bahrain Healthcare system is impacted by many sectors including social, economic and political policy. The Ministry of Health sets Healthcare policy, strategies, manages the changing process in the healthcare system and undertakes major decisions to maintain their position as a healthcare provider. As the Ministry of Health focuses their efforts towards reducing barriers to service and between services, the vision for an integrated health service system will become reality with "Health Services Without Walls". The Information Technology Strategy is the enabler of the business of healthcare and the healthcare strategy. This link supports productivity, quality and value to the stakeholders of the Healthcare system.

Ministry of Health Strategy

The Ministry has also set out six core principles: "accessibility, affordability, appropriateness, accountability, accreditation and acceptability "(Ministry of Health Direction,2002). The foundation for these core principles is through the commitment and implementation of an evidence-based management that requires a total restructuring and redevelopment of its information and automation strategies and systems. The Ministry of Health Information Systems Project (MHIS) was initiated in June 2000 to define these strategies and systems, and identify a partner that would re-engineer and modernize the current environment to a knowledge managed health system. Information Technology (IT) and Information Management Systems (IMS) have a central role as an enabler in the healthcare business and the ministry recognizes that it requires a sophisticated IT system to maintain and improve the quality of service in the most cost effective manner.

Information and Communication Technology Strategy

The Ministry of Health Information and Communication Technology Strategy (ICT) is defined to cover the Ministry of Health as a corporate policymaker as well as administrative directorates and health service providers in hospitals, clinics, and health centers. It works in parallel with the Ministry of Health Strategic Direction and Framework for Action, in addition to focusing on innovative ideas to support the issues created from uncertainty in areas such as Health insurance, Human Resource Management, Materials Management, Drug management and cost containment. The Ministry of Health (MoH) in Bahrain has now completed the study with plans to select and implement an advanced IT strategic solution that will handle the provision of world-class services, and provide support to its customers and citizens of Bahrain.

Introduction...
ICT Strategy Development Approach

The Health Information Directorate (HID), in conjunction with a specialized IT consultancy firm were involved in developing the ICT strategy. The procedure for creating this strategy was divided into four phases, as illustrated below:

Strategic Direction	Assessment	Strategic Plan	Tactical Plan

ICT Strategy Development Approach Diagram

Strategic Direction

In the first phase, the Ministry of Health requirements and its business strategy were formulated in discussions with MoH Management. The ICT Strategy Articulation was developed based on the business objectives and the overall strategic direction for the Ministry.

Assessment

In the second phase, the existing information systems were evaluated with respect to how it supports business processes, together with any external influencing factors, such as the information technology trends among health sector services.

Strategic Plan

In the third phase, a recommendation of the information systems architecture (applications, data and technological architectures) was produced. Best Practice Methodology and the local business needs were considered to make that recommendation. The main objective of this work was to establish a qualified basis for planning work.

Tactical Plan

In the final phase, a strategic roadmap was drawn, setting out in detail the priorities, the implementation methods, the resources required and a timetable for individual information technology projects.

Strategic Direction

The Ministry of Health requirements and its business strategy were formulated in discussions with MoH Management. The ICT Strategy Articulation was developed based on the business objectives and the overall strategic direction for the Ministry.

Ministry of Health *Vision*

The Ministry of Heatlh works in partnership with stakeholders to improve the health of the population of Bahrain and ensure that everyone has access to a high quality, responsive health service throughout their lifetime.

ICT Strategy *Mission*

To provide the right information to the right people at the right time that will facilitate improvements to MoH Staff and Services to produce the best health results at reasonable cost.

Strategic Direction...
ICT Strategy Linkage

The Information and Communication Technology Strategy will have an impact on the technolgy required to link People (Bahrain individuals) to Providers and Suppliers of healthcare services, as well as on the payers and regulators.

People

The implementation of this strategy will enable all individuals of Bahrain to have direct access to national healthcare services and to national and international healthcare information. It will be possible to schedule appointments with providers & suppliers, to get information about lifestyles and health, to communicate with regulators and with payers. By using the web technologies, it will be possible to access any healthcare information regardless where and in what format it has been packed.
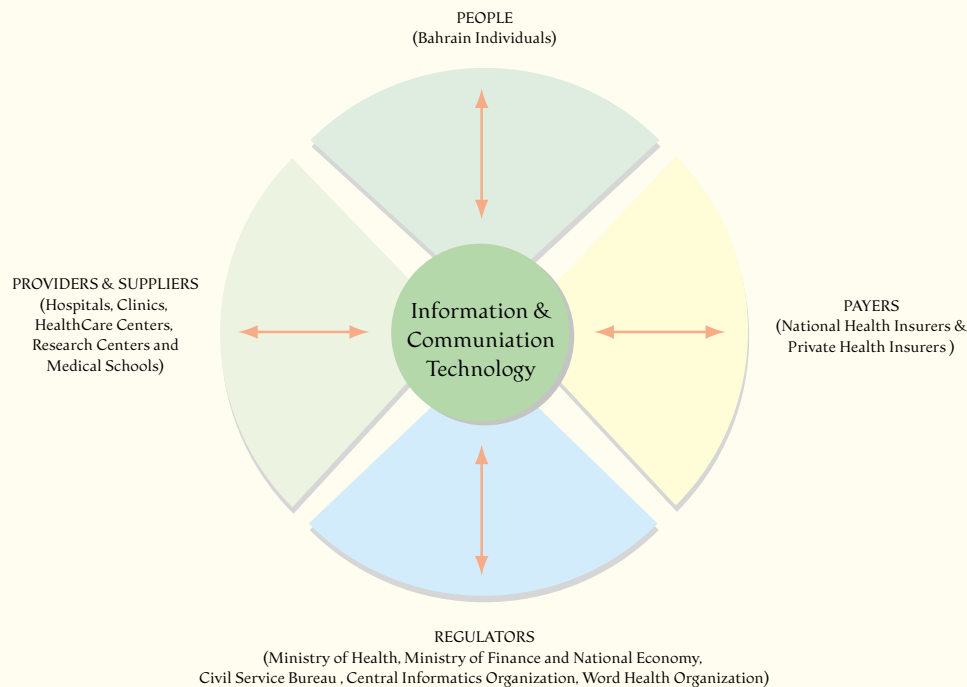
Providers & Suppliers

Providers and Suppliers in Bahrain will be connected to each other and to all other key actors of the healthcare society. This will give them an unprecedented opportunity to streamline operations, to improve contracting service levels and after all to reduce operating costs while improving quality. MoH will benefit dramatically from this "non limited connectivity" and by enlarge, every individual will benefit.

Payers

National and private health insurance organizations will be linked to individuals, providers, suppliers, payers, and regulators, and to the whole world. This will improve dramatically the request for transparency about operations, and the satisfaction of customers.

Regulators

National and international regulators will be connected and will exchange reliable and to-the-point information about healthcare and the health status in Bahrain. Such regulators include the Ministry of Health, Ministry of Finance and National Economy (MoFNE), Civil Service Bureau (CSB), Central Informatics Organization (CIO) and Word Health Organization (WHO). Reporting will be easy and can be presented with the different standard formats as required by the requesting organization.

PEOPLE
(Bahrain Individuals)

PROVIDERS & SUPPLIERS
(Hospitals, Clinics,
HealthCare Centers,
Research Centers and
Medical Schools)

Information &
Communiation
Technology

PAYERS
(National Health Insurers &
Private Health Insurers)

REGULATORS
(Ministry of Health, Ministry of Finance and National Economy,
Civil Service Bureau , Central Informatics Organization, Word Health Organization)

Strategy Articulation Diagram

ICT Strategic Goal & Objectives

ICT Strategic Goal

To ensure that the implementation of the ICT strategy as enabler will underpin the Bahrain Health Strategy, Ministry of Health Direction and that necessary organizational change accompanies the investment in technology.

ICT Strategic Objectives

1. Continue to provide an information communication technology infrastructure that will link and support transactions and information sharing between government regulators, private and public healthcare providers and suppliers, the people of Bahrain, future alternative payers.

2. Provide a National Health Information Center that will provide real time online analytical decision support tools to assist in the improvement of daily operations and clinical practice, as well as data warehouse decision support tools for analyzing retrospective information that will assist in prospectively planning improvements for the quality of services provided, the effectiveness of the delivery of services, and the efficient utilization of resources.

3. Develop a programme of process reengineering to support the implementation of information and communication technology.

4. Provide an integrated healthcare provider system that will support referrals and information sharing between the private and public clinical venues of tertiary, secondary, or primary care across Bahrain.

5. Provide an Insurance Based Funding Software that supports the Provider/Payer/Regulator requirements. This system must be flexible and scalable to accommodate salaries, capitated or fee-for-service Physician services, mixed or elective basic government funded services and insured services.

Strategic Direction...

Key Benefits

The key benefits that MoH will realize from the implementation of the strategy can be categorized under the following main headings:

Healthcare Benefits

Better Patient Care and Continuity of Care

- Continuity of care will be enhanced as the information is accessible to healthcare providers from the care environments where the patient was treated.

- An accessible comprehensive patient history can lead to better informed assessment resulting in improved care management.

- Access to medical alert information such as potential allergies to medication could reduce the potential for errors resulting in adverse events.

- Tracking of patients across health facilities within a user-specified timeframe will lead to a better understanding of utilization patterns.

Greater Cost Effective Service Delivery

- Tracking of health service events across a patient's history will allow better planned and more cost effective service delivery.

- Less duplication of services will result in reduced administrative time.

Performance Monitoring

- Tracking of patients will allow for system wide performance measurement including resource usage and service delivery measures.

Privacy Protection

- Privacy and confidentiality will be protected in line with legislative requirements.

Administrative Benefits

Human Resource Management Benefits

- Improvement in accurate and timely payroll processing.

- Improved employee satisfaction resulting from effective processes for performance assessment, grievances, etc.

- Improvement in assessing and meeting the training and development needs.

- Improved work practices due to the integrated system within HR and across all functions.

Financial Management Benefits

- Ability to measure the aggregate cost of various health care services based on activities associated with an individual patient.

- Ability to evaluate and implement alternative health care financial plans.

- Improvement in entering accurate and timely journal vouchers.

- Improvement in cost control by knowing accurately the budget versus actual expenditures.

- Improved on-line validation controls and hence data accuracy.

- Reduction in effort due to availability of integrated, timely and accurate information from other functions.

- Improvement in fixed asset tracking, depreciation accounting and timely disposal of assets.

Assessment

The existing Information Technology Services were evaluated with respect to how it supports business processes, together with any external factors influencing, such as the Government Initiative and the information technology trends among health sector services.

Existing Information Technology Services

The Health Information Directorate (HID) has played a major role in implementing appropriate Information Technology Services to improve the healthcare outcomes through leadership, qualified team, and commitment. Various services such as Software, Infrastructure, and Communication have been implemented and managed successfully to deliver the maximum possible information that can facilitate and enable the MoH business.

Software Services

The current software packages are mainly covering the basic functions such as Admission-Transfer and Discharge, Financials, Radiology, Lab, Appointments, and Logistic services. Most of the applications are handling data and are connected by point to point interfaces.

Infrastructure Services

MoH has implemented many Local Area Network (LAN) & Wide Area Network (WAN) Infrastructure projects. These implementations contributed to improving the availability and quality of services by providing access to various systems.

All buildings within Salmaniya Medical Complex (SMC) are interconnected through a fiber optic network underground. This minimized the communication cost, and provides fast and reliable access to the network resources. In addition, all departments are connected to and managed from one central location through 100Mbps Ethernet network where all resources are maintained and supported by expert people.

Different data types are accessed through the network

1. Clinical Data (Radiology, Pathology, Medical Records, etc)

2. Administrative data (Financial, Personnel, Material Management, Drug control, Laundry, etc)

3. Other services (Internet, Email, etc)

In Addition, MoH connected many remote sites such as Health Centers, Head Quarter offices, and External hospitals through Frame Relay and Leased lines circuits.

Also, MoH is part of the Government Data Network (GDN) that connects all Bahrain Government Bodies and exchanges data. MoH is using Microwave and Infrared technologies to connect to GDN, which provide faster and cost effective solution.

Communication Services

- Internet website was developed with the aim of publishing MoH services on the web. The website contains valuable information about health services, facilities, activities as well as health education, health conferences and health societies. Public information includes health centers contact numbers, opening hours, medical checkup guidelines for students and domestic workers and other information required by the public sector.

- Intranet website has been developed with the objective of communication and sharing of information. The intranet enables MoH employees, departments and functions to get easier access to quality information, improve speed of communication and reduce the number of papers floating around. Most of the health functions have web pages on the intranet.

- Groupware email service was introduced and implemented successfully. Most of the departments including Head office have been connected through Groupware. This tool is considered the standard for internal communication within the ministry.

Assessment...

ICT Strategy Drivers

The ICT strategy drivers (Strategic, Technological, and Government Initiative) play a contributory role in driving MoH to develop an ICT strategy in order to deliver the required information and achieve the expected benefits.

Strategic Drivers

1. Demands on Health services

   There is an increased demand for services in general in the market. The customer is demanding quality service at his convenience. The client "sits in the driver seat". This phenomenon is also emerging in the healthcare service sector. one of the tangible elements of this evolution is the demand for new and different services in healthcare such as life style, and mental health consulting by a multi-disciplinary healthcare team.

2. MoH Strategy for Health

   As a result of the reduction in infant mortality and the control over communicable diseases, the life expectancy has been increased. Moreover, more attention has been paied on combating non-communicable diseases such as circulatory diseases (coronary heart disease,), neoplasma's and chronic diseases and to prevent illnesses.

3. MoH Health Insurance initiative

   The current healthcare system is based on public funding. As health care expenditure is increasing, demand for services is expecting to influence this increase. New approaches to financing healthcare are emerging. Health Insurance is a strategic project that MoH has initiated to recover parts of the healthcare cost.

4. Medical Tourism initiative

   The Minstry of Health is investigating the feasibility of Medical Tourism in Bahrain. And it's obvious that the healthcare is an information-based and information-driven activity. As a result, the Information and Communication Technology becomes one of the primary concerns of improving the quality of healthcare services.

5. MoH Disaster Management planning

   Bahrain has recognized the importance of disaster management planning , and it has mandated a team to explore and improve the disaster planning program for the kingdom .

6. Bahrain e-government initiative

   The government has launched the e-government initiative. The healthcare society in Bahrain represents a major part of the targeted customers. It is crucial that MoH participate effectively in this initative.

Technological Drivers

1. Catch up from the past

   The previous program of work for the period 1996 –2000 was very ambitious, but due to the Y2K issues, it has been completed only partially. As a result the Ministry of Health has to catch up in order to be back at the pole position where it wants to be.

2. Information and Communication Technology driving business change

   Although there has been significant progress over the past 20 years in healthcare IT, the next 10 years promise to eclipse anything that has gone before. For the first time, IT will truly

Strategic

Technological

Government Initiative
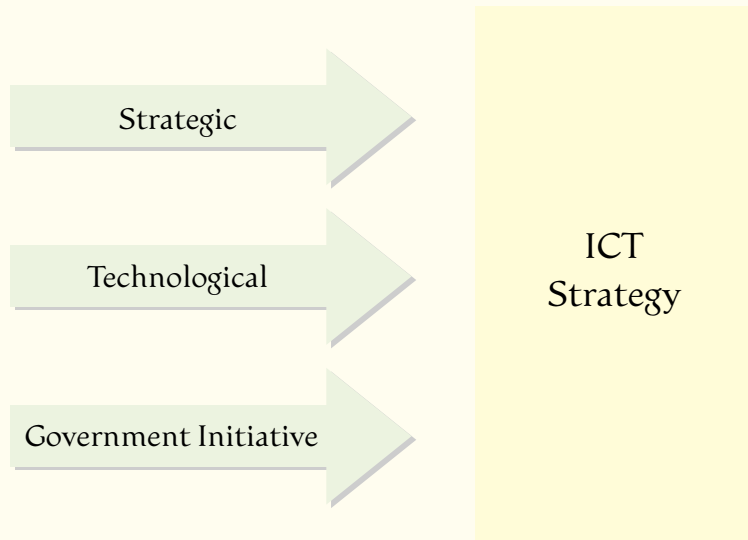
ICT Strategy

ICT Strategy Drivers Diagram

provide the major impetus for change, rather than simply responding to the process of change it self. In this environment, the key question is not if technology can be used to benefit patient care, but how it can be used. MoH has to benefit from this wave, to improve the health status of the population.

3. Conformance to open systems standards

Adequate usage of information resources is essential to promote quality and competitiveness of modern healthcare organizations. Standards are therefore mandatory to bring about a range of benefits, including data quality, transmission performance and true outputs from information sharing. Standardization issues are becoming globally relevant and more complex. Currently there are diverse standard production activities for health informatics in the world, predominantly in Europe and the USA. An International Framework for Standards has been set up. International and national bodies for standards have been established for the fields of commerce, electrical, and ICT standards.

Healthcare organizations who are not aware of the standardization process can be subjected to

severe risks to their investment in technological solutions.

4. Exponential growth of ICT

Convergence of healthcare systems, together with emergence of realistic standards (imposed or de facto) development tools and widespread networking to facilitate information sharing, make implementation of global solutions a reality for healthcare in the immediate future. Healthcare is an information intensive service sector, often involved in mission critical activities.

5. MoH Pole position for future "e-health" development

Bahrain is one of the healthiest countries in the Gulf region. It has the pole position in many activities such as banking, insurance, and education. In line with this ambition, the government has launched the e-government initiative to improve the service to the customer. The MoH can benefit from this project by "jumping on the e-government wagon", and develop synergies to better serve the individuals in all matters of healthcare. The design and implementation of a healthcare portal by MoH will offer direct access to information and services of the healthcare system to all residents.

6. McDonnell Douglas Information System no longer has application support

Currently the Ministry of Health relies on the McDonnell Douglas Information System (MDIS) system. The MDIS vendor has abandoned the support of the application. The lack of application support from the vendor is driving MoH to find a replacement to this obsolete and "dying" technology. MoH has to rescue the history database that has been built over the past.

Assessment...

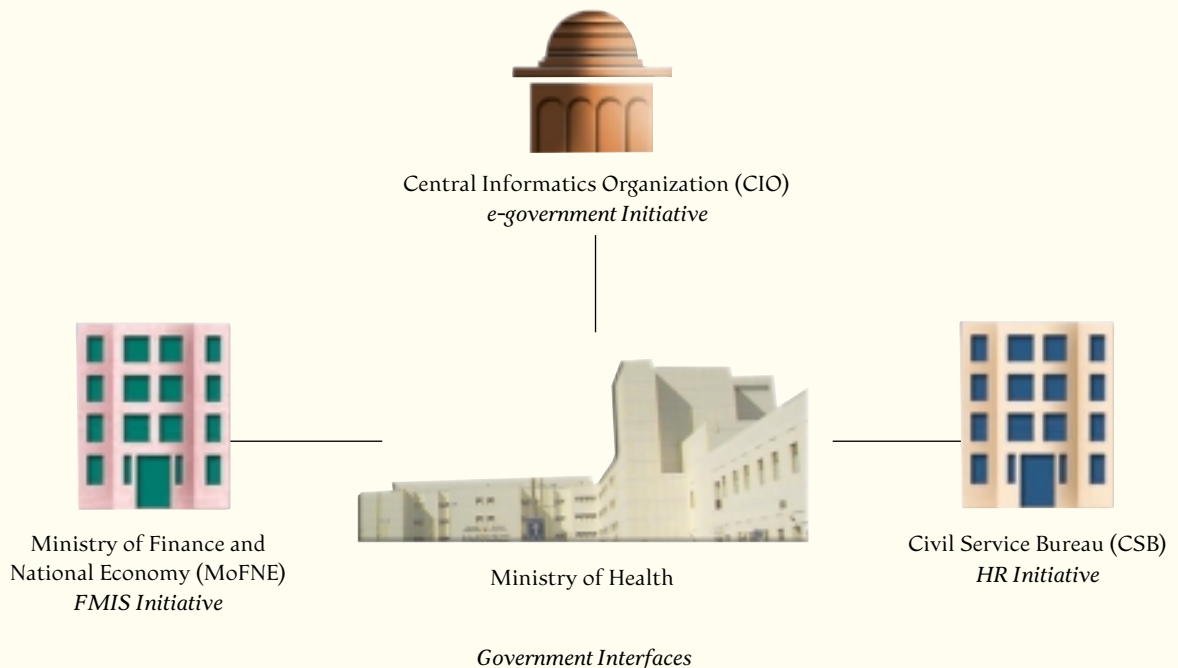1. Ministry of Finance and National Economy Initiative

   The Ministry of Finance and National Economy (MoFNE) has initiated a Financial Management Information System (FMIS) initiative. This initiative is a key factor impacting the financial systems at the Ministry of Health. The Ministry of Health has specific Activity Based Costing requirements that need to be implemented in a financial system to support the insurance initiative. The financial systems at MoH would then be integrated to MoFNE while providing for other specific requirements like the tendering process.

2. Civil Service Bureau Initiative

   The Human Resource initiative sponsored by the Civil Service Bureau (CSB) is another major initiative. Therefore, the MoH has to be ready with its healthcare manpower-planning project to complement this initiative.

3. Central Informatics Organization Initiative

   The migration of Central Informatics Organization (CIO) from a legacy system to an open system environment will drive MoH to find a replacement to the current applications running on the CIO legacy environment which CIO will stop supporting.

Central Informatics Organization (CIO)
e-government Initiative

Ministry of Finance and National Economy (MoFNE)
FMIS Initiative

Ministry of Health

Civil Service Bureau (CSB)
HR Initiative

Government Interfaces

Strategic Plan

The implementation of the ICT Strategy consists of three fundamental components which are Application Architecture, Essential Infrastructure, and Enabling People & Business. These components should be deployed successfully to provide the required healthcare services in the most effective and efficient way.

Application Architecure

The impact of the strategy has been documented in the format of forty four subprojects which have been identified, clearly described, classified and grouped into 5 homogeneous major programs.

1. Healthcare Core Program
2. Healthcare Support Program
3. Administrative Program
4. National Program
5. Common Services Program
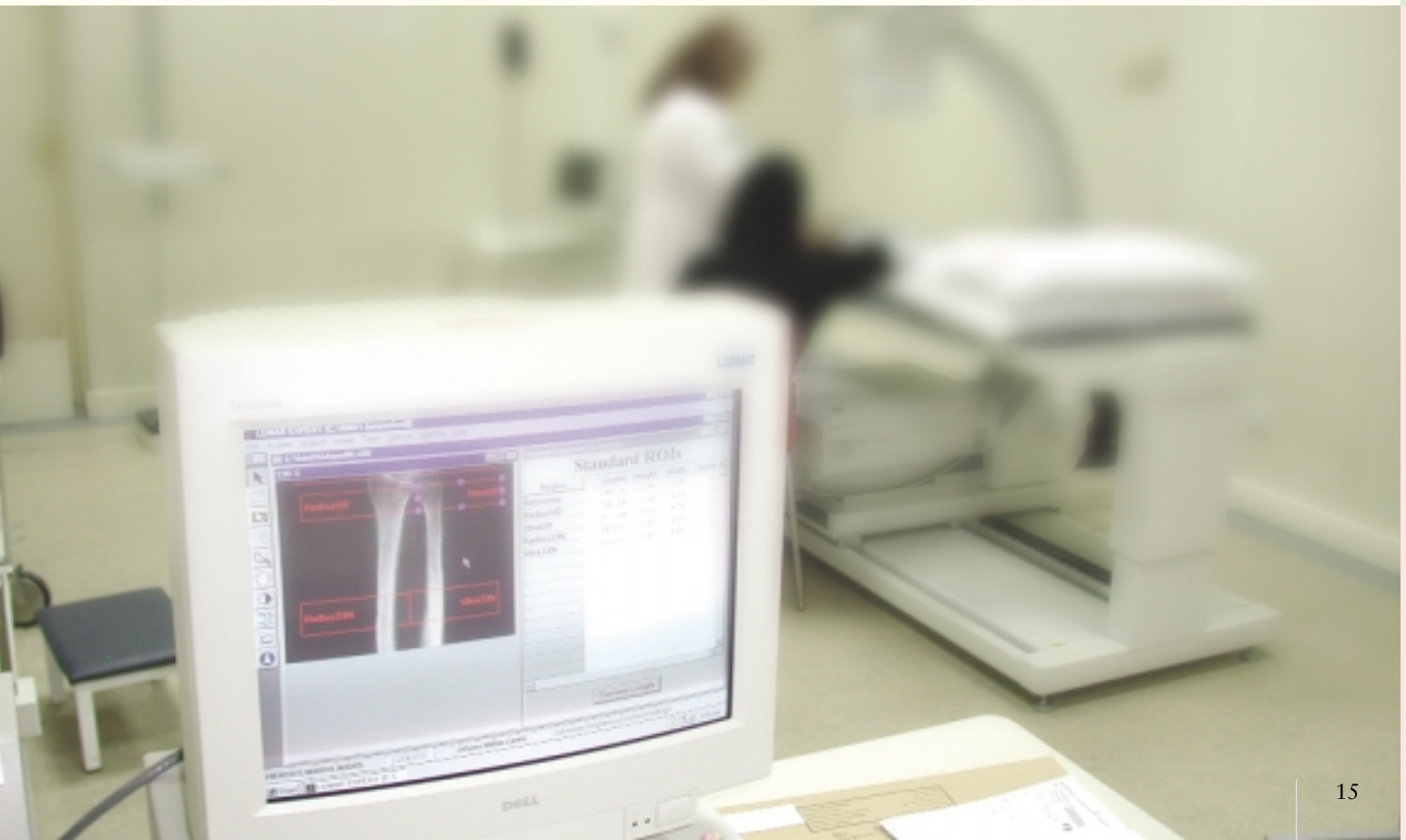
Strategic Plan...

The future application architecure consists of 44 functional application modules that would be deployed across the MoH over the next five years.

Program Name	Subproject Name
Common Services Program	**Technical Infrastructure Support Software**
	1. Network Management Software
	2. Integration Engine
	3. Security Management
	4. Helpdesk
	Organization Support Software
	5. Office Automation
	6. Call Center
	Decision Support Software
	7. Data Warehousing
	8. Online Real Time Queries
	9. Rules Management
	10. Knowledge Management
	11. Policy and Planning
	12. Quality Management
HealthCore Program	**Application Infrastructure Software**
	13. Patient Management
	14. Unique Standard Patient File
	15. ICD / Grouper / Abstracting
	16. Appointment
	Order Result and Prescription Communication Software
	17. Orders and results communications
	18. Pharmacy Management and Supply
	19. Radiology Management
	20. Laboratory Management

Healthcare Support Program

Comm
Servi
Prog

National Program

Application Programs Diagram

*Healthcare Core
Program*

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*Administrative
Program*

Specialty Area Application Software

21. Primary Healthcare
22. Accidents & Emergency
23. Theatre
24. Nutrition
25. ICU

National Program

26. Drug Control
27. Licensure, Registration and Certification
28. Public Health and Community Support
29. College Management

Health Support Program

30. Health Insurance Management
31. Maintenance Management
32. Catering
33. Laundry and Housekeeping

Administrative Program

Finance and Insurance Software

34. Finance Management
35. Budgeting
36. Patient Billing
37. Activity Based Costing

Supply Chain Management Software

38. Inventory Management
39. Supply Chain Management
40. Tendering

Manpower Management Information Software

41. Staff Management
42. Time Attendance
43. Staff Scheduling
44. Training

Strategic Plan...
Essential Infrastructure

The infrastructure is the backbone of any technology project where we can set a solid base to build up other technology components. The future of infrastructure drives the evolution of Information Technology.

For those reasons, MoH's vision should include building proper, scalable, and reliable infrastructure that will introduce more effective services and solve the existing problems. As an example, Virtual Private Network (VPN) can be used effectively to make information available anywhere, anytime through a secure channel that will cost as a normal telephone call.

Also, Wireless Networking (WLAN) is becoming a key word in the infrastructure business. It provides a high Return On Investments (ROI) due to the mobility, and availability it provides. This can be used in patients areas where access to information should be very quick and from any location. WLAN is very easy to scale as it does not require much civil work.

Another Important Infrastructure element is the Microwave and Infrared that are used to connect remote sites. These types of communication provide the high and reliable bandwidth required to exchange information with minimal cost.

Enabling People and Business

To achieve efficient and effective use of the new technology, the strategy has considered the following activities:

1. IT Education and Training

   The strategy recognises the need for staff to be trained in basic computer skills and software application so that they can utilize the technology to achieve maximum benefits from the introduction of the new strategy.

2. Change Management

   Change Management is the activity that provides knowledge and skills to implement methodology and tools for managing changes. Managing changes will accelerate the implementation of the change and encourage the employees to contribute to the success of the strategy.

3. Business Process Reengineering

   Improving business processes is critical to maximize the potential benefits of the recommended strategy. With the implementation of the recommended strategy, MoH will realize better optimization of healthcare processes, which will lead to better utilization of resources and improved services.
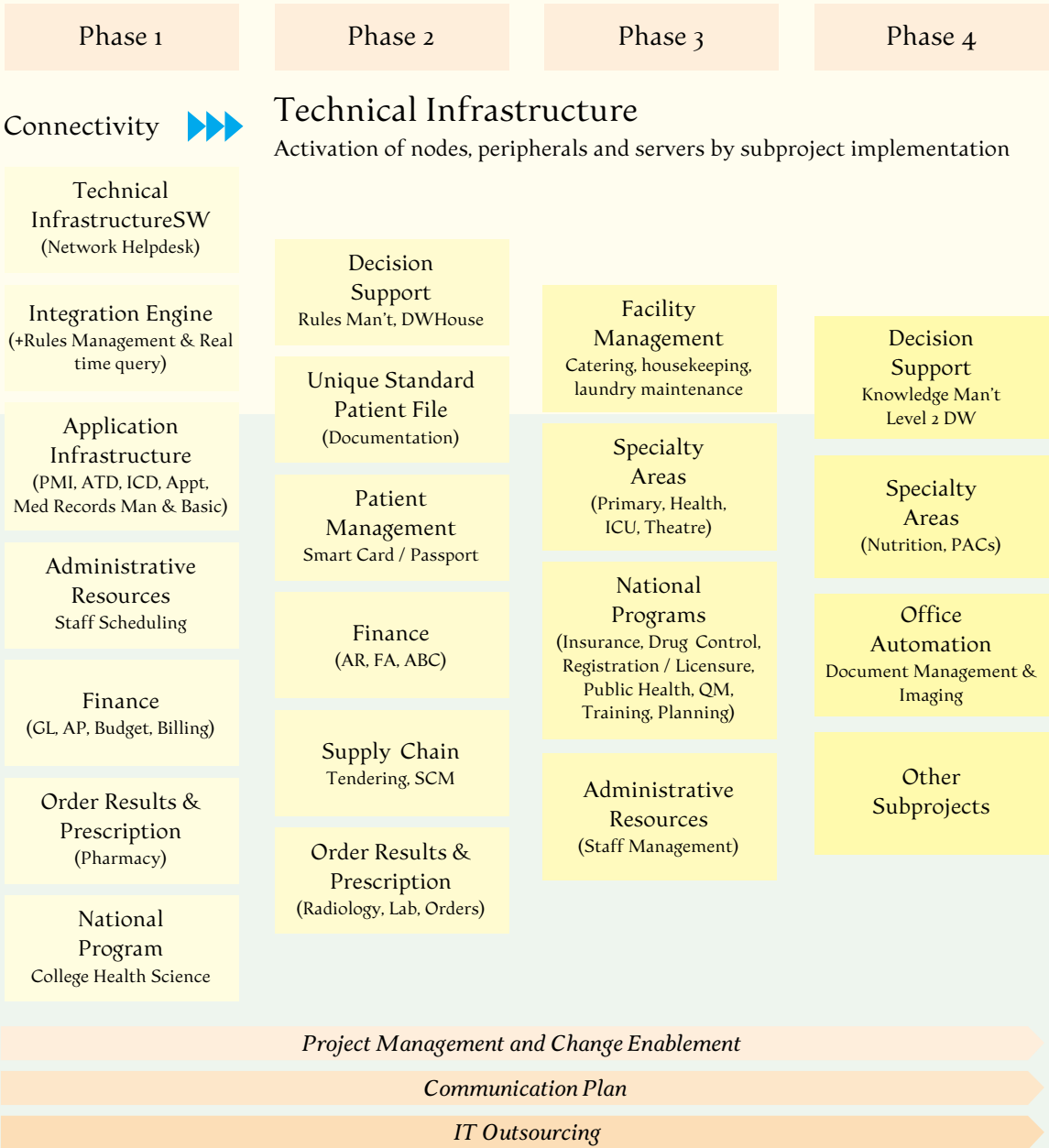
Tactical Plan

A strategic roadmap was drawn, setting out in detail the priorities, the implementation methods, the resources required and a timetable for individual information technology projects.

ICT Strategy RoadMap

The implementation of the strategy will be accomplished in a step by step approach and the phasing of the projects will be in four phases. The roadmap will be refined based on the software selection, the implementation plan and the final budget approval.

Phase 1	Phase 2	Phase 3	Phase 4

Connectivity ▶▶▶

Technical Infrastructure
Activation of nodes, peripherals and servers by subproject implementation

Phase 1	Phase 2	Phase 3	Phase 4
Technical InfrastructureSW (Network Helpdesk)			
Integration Engine (+Rules Management & Real time query)	Decision Support Rules Man't, DWHouse		
Application Infrastructure (PMI, ATD, ICD, Appt, Med Records Man & Basic)	Unique Standard Patient File (Documentation)	Facility Management Catering, housekeeping, laundry maintenance	Decision Support Knowledge Man't Level 2 DW
Administrative Resources Staff Scheduling	Patient Management Smart Card / Passport	Specialty Areas (Primary, Health, ICU, Theatre)	Specialty Areas (Nutrition, PACs)
Finance (GL, AP, Budget, Billing)	Finance (AR, FA, ABC)	National Programs (Insurance, Drug Control, Registration / Licensure, Public Health, QM, Training, Planning)	Office Automation Document Management & Imaging
Order Results & Prescription (Pharmacy)	Supply Chain Tendering, SCM	Administrative Resources (Staff Management)	Other Subprojects
National Program College Health Science	Order Results & Prescription (Radiology, Lab, Orders)		

Project Management and Change Enablement

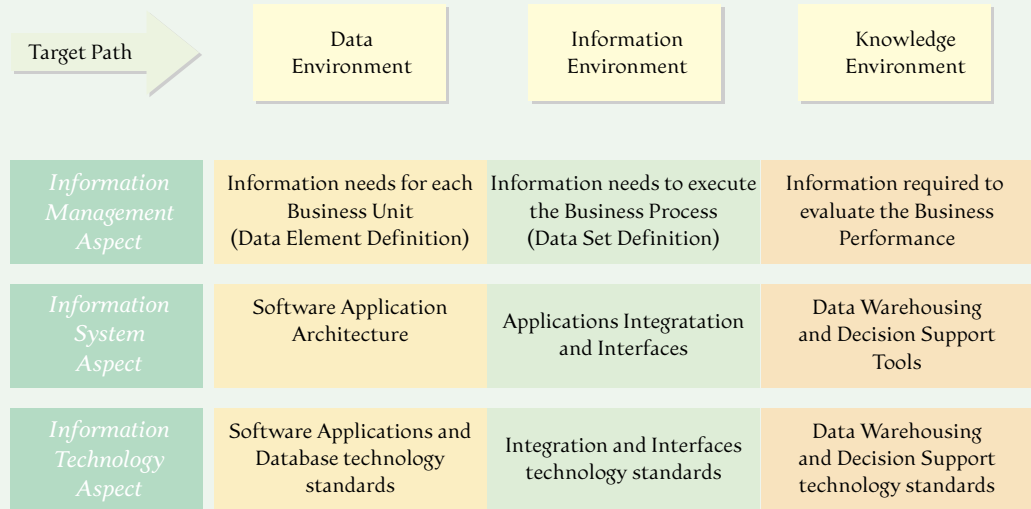*Communication Plan*

IT Outsourcing

Tactical Plan...
Framework Model

The Framework Model provides an overview of three different strategic aspects about the way of moving the business from a data environment into a knowledge environment. These aspects are Information Management, Information System and Information Technology.

Target Path →	Data Environment	Information Environment	Knowledge Environment
Information Management Aspect	Information needs for each Business Unit (Data Element Definition)	Information needs to execute the Business Process (Data Set Definition)	Information required to evaluate the Business Performance
Information System Aspect	Software Application Architecture	Applications Integratation and Interfaces	Data Warehousing and Decision Support Tools
Information Technology Aspect	Software Applications and Database technology standards	Integration and Interfaces technology standards	Data Warehousing and Decision Support technology standards

Framework Aspects

Information Management Aspect: The plan of how to align the business units' information needs to the organization needs for evidence based performance management.

Information System Aspect: The plan of how to align the computer systems to the business needs of the organization.

Information Technology Aspect: The plan of how to align the computer systems to the policies for computer system architecture, standards and security.

Framework Approach

The common ground between these aspects is that they are focusing on same approach of moving the business from a data environment over an information environment into a knowledge environment.

- Data Environment

  Design the software application architecture based on Business requirements. Select proper applications according to Software and Data Base technology standards.

- Information Environment

  Align the Integration between the software applications to the Business Process using an Integration Technology to enable the Ministry to achieve a comprehensive information environment.

- Knowledge Environment

  Structure the information in a Data Warehousing with the availability of Decision Support Tools to enable the Ministry to evaluate and improve the business performance and the strategy achievements.

Moving Forward

The aim of this strategy is to set the direction of the ICT development in the Ministry of Health. The success of this strategy relies on the successful implementation of all of its recommendations. Moreover, in order to ensure fruitful results, a successful partnership should be established to guarantee the expected outcomes. Indeed, implementing the strategy will put the MoH in a leading position to move forward and optimize its use of technology to deliver modern, efficient and effective healthcare services to the public.

Appendix

Enabling the Business Strategy

The Information and Communication Technology Strategy (ICT) has a central role as an enabler of the business strategy. The following table shows the MoH commitment and the ICT Strategy Solution to enable the Ministry of Health Policy Direction.

Ministry of Health Policy Direction	Ministry of Health Commitment	ICT Strategy Solution
1 Philosophy and Service Policy	**1 Enablement of the MoH Philosophy and Service Policy**	**1. State of the art technology to support data, voice, and image transmission throughout the MoH**
1.1 Development of a more responsive, accessible system of services.	1.1 To provide an information communication technology infrastructure that will link and support transactions and information sharing between government regulators, private and public healthcare providers and suppliers, the people of Bahrain, and future alternative payers.	1.1 & 1.2 The ICT network strategy will enhance current operations and optimize current investment in technology by:
1.2 Creation of seamless referral network across a fully integrated continuum of care.		• Implementing a network management software and network infrastructure connecting all healthcare facilities, optimizing network performance and minimize down time.
1.3 Public Consultation & access to improved service and information.	1.2 To support the continuum of care through a lifetime electronic patient record that can be accessed from any MoH care provider.	• Implementing a security plan for Bahrain Health Information.
1.4 Health promotion programs which includes:	1.3 To improve public access to information on healthcare, services, and specialty programs.	1.3 The MoH Internet website will provide direct online information services, appointments, and interactive telemedicine services.
• lifestyle	1.4 To provide information that reflects and encourages public responsibility and participation in health promotion programs. To create more public and self awareness and accountability for their health.	1.4 The corporate website will provide health promotion information that will enable people to be informed partners and encourage them to make healthy choices promoting their own health.
• environmental health		
• community health		
• children's health, safety and security		
• women's health		

Appendix...

Ministry of Health Policy Direction	Ministry of Health Commitment	ICT Strategy Solution
2 Planning Policy	**2 Enablement of the MoH Planning Policy**	**2 MHIS Planning Policy Solution**
2.1 Development of the master plan – Bahrain National Health Plan.	2.1 To provide a communication network that will support the articulation of the strategy and goals.	2.1 Computerized Directorates will increase potential for desktop access to email and web browsing. Intranet development will be business focused in both design and information content.
2.2 Bahrain National Health Plan (BNHP) will incorporate health system design and articulate key strategies, tactics, and resources for reaching goals.	2.2 To support BNHP implementation by implementing key business IT enabled projects that will increase the success factor in goal achievement.	2.2 Restructuring will incorporate customer services and accounts management, interfacing of business areas knowledge into IT.
2.3 MoH will work collaboratively with other ministries, private sector, communities and individuals.	2.3 To encourage collaboration with other government entities through e-government initiatives and to provide public information and awareness.	2.3 E-health will enhance e-government initiatives and community involvement, e-commerce applications will enhance tendering and private sector access, online patient record will enhance individual access and public access to information via the internet.
2.4 Build upon the current system changing only where there is demonstrated added value improving performance and service, and health outcomes.	2.4 To enhance Current investment in technology by adding value through modernizing systems, business process reengineering, and information management. ● Activity Based Costing ● Life cycle costing ● Selecting best alternatives ● Looking at best practice	2.4 Internationally recognized systems will be implemented ensuring best practice processes and standards; integration engine will be utilized for integrating data from disparate systems, thereby enhancing information.
2.5 Professional workforce is most valuable asset. Health is a people industry and dependent of professional practice. Focus on recruitment, retention, education and training strategies to sustain health system.	2.5 To provide the MoH with an environment conducive to learning by encouraging a computer literate and performance- based organization.	2.5 To incorporate basic computer training and high level analysis training for current employees, and as a pre-requisite to hiring new employees.
3 Resource Allocation Policy	**3 Enablement of the MoH Resource Allocation**	**3 MHIS Resource Allocation Solution**
3.1 Comprehensive review of current resource allocation policy	3.1 To provide comprehensive human resource, financial, inventory applications that will aid in the review of current resource allocation policy.	3.1 International Statistical Classification of Disease (ICD) encoder grouper applications, when integrated with clinical, workload and financial applications will provide case costing, as well as prospective and retrospective activity based costing and manpower information.
3.2 Identify opportunities for increased investment, revenue generation and reallocation of resources.	3.2 To provide information decision support that will assist MoH and MoFNE in identifying opportunities for increased investment, revenue generation and reallocation of resources	3.2 Analytical systems as well as executive and business decision support systems will provide information to identify opportunities for increased investment, revenue generation and reallocation of resources.
3.3 Introduce a system of accountability and evidence based management practice.	3.3 To provide automated systems with built in accountability and accreditation standards.	3.3 To provide a rule based and quality system that will automate systems of accountability by flagging variances.
3.4 Work collaboratively with Ministry of Finance and National Economy in health service funding strategy, including joint venture initiatives with the private sector based on revenue sharing formulae.	3.4 To ensure that health service systems support joint venture initiatives with the private sector based on revenue sharing formulae.	3.4 Health service and financial systems will support the private sector incorporating revenue sharing formulae.
3.5 Health Insurance Strategies.	3.5 To provide systems that support payor and payee components to maximize Health Insurance Strategies.	3.5 The Billing system and Insurance system will be flexible enough to support payor and payee components to maximize Health Insurance Strategies.
3.6 Manpower services to improve: ● Recruitment process and retention performance. ● Adjustment of compensation programs. ● Restructure performance incentive programs and improve responsiveness and recognition for employees. ● Implement manpower development strategies correlating skill requirements with training and development programs.	3.6 To provide Manpower applications components that will enable Human Resource (HR) services to improve: ● Recruitment process and retention performance ● Adjustment of compensation programs ● Restructure performance incentive programs and improve responsiveness and recognition for employees ● correlating skill requirements with training and development programs	3.6 The HR system will incorporate the Recruitment process and retention performance, compensation programs, performance incentive programs, and correlate skill requirements with training and development programs.

Appendix...

Ministry of Health Policy Direction	Ministry of Health Commitment	ICT Strategy Solution
4 Health Service Delivery Policy	**4 Enablement of Health Service Delivery**	**4 MHIS Health Service Delivery Solution**
4.1 Encourage decentralization of service and improved efficiency of practice.	4.1 To provide a National Health Information Center for real-time decision support of daily operations and health practice. Support data warehouse for retrospective and prospective planning for value added re-engineering of services.	4.1 The National Health Information Data warehouse will provide standardized, validated, protected information and tools will provide retrospective information to assist in prospectively planning improvements.
4.2 Consistent and quality practice through Health Policy Network providing practice expectations and guidelines as well as mandatory orientation.	4.2 An automated Health Policy Network will be accessible to all employees of MoH by the intranet & accessible to all Health Service Providers via Internet for policy applicable at the National level.	4.2 The MoH Intranet Health Policy Network will build in Signing authorization, employee electronic signatures, flagging of new policy or employee education requirements, as well as a library of standards and processes.
4.3 Global and program budgets with more autonomous yet accountable performance standards.	4.3 To provide desktop access to financial information, and automate internal and value audit systems.	4.3 Information will be designed for access at any level of the organization, including global, program, department, specialty etc.
4.4 Shift to programs of health promotion, prevention and early intervention decreasing workload on acute services removing walls, and	4.4 A person's health record will be an electronic lifetime record that is accessed at any point of care and across the continuum of care.	4.4 The electronic record will be built through the integration engine, incorporating health service records over a lifetime.
4.5 Evidence based performance evaluation and funding incentives based on case costing.	4.5 Improve access to knowledge bases & evidence based information.	4.5 Online knowledge resources will be provided through new resources and a shared Library.
5 Performance Management Policy	**5 Enabler of Performance Management Policy**	**5 MHIS Performance Management Solution**
5.1 Implementation of a comprehensive Performance management system to monitor and control standards of practice, audit compliance and value.	5.1 MoH wide Performance results and messaging will improve standards compliance, ensure audit compliance.	5.1 All applications will incorporate a comprehensive rule based Performance management system to monitor and control standards.
5.2 Provide for evidence based practice evaluation and change.	5.2 To provide best practice through international research based systems.	5.2 Process reengineering and change management will be incorporated into system implementation.
5.3 Regulatory and Licensing authority for practices, licensing, discipline and standards Internal audit program for financial, compliance, operational and value audit.	5.3 To provide a system for licensing, practice, discipline and standards.	5.3 The Licensure and Registration system will integrate with employee profiles, patient complaints, standards compliance
5.5 System for Performance evaluation will be designed to capture data from all levels of the system & generate information that will support evidence based management & practice.	5.4 To build internal audit system into all applications	5.4 Quality and performance rule builder applications will be flexible and user defined to field level.
5.6 Performance systems for clinical practice will focus on outcomes for patients that demonstrate genuine sustainable improvement in health status and optimize health potential & quality of life.	5.5 To design a system of performance evaluation that can capture data from all levels of the system.	5.5 To provide evidence based management and evaluation of practice information from all levels of the organization.
	5.6 To provide National, health system and individual scores, and monitor and evaluate progress compared to both internal baseline and international standards and benchmarks.	5.6 Outcomes based information will provide health indicator information from individual to aggregated population information.

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