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I. INTRODUCTION

Enterprise Architecture started in 1987, with the publication in the IBM SYSTEMS JOURNAL of an article "A Framework for Information Systems Architecture," by J.A. Zachman. In that article, Zachman laid out the challenge and the vision of enterprise architectures that would guide the field for the next 20 years. The major challenge was to manage the complexity of increasingly distributed systems. Zachman stated "The cost involved and the success of the business depending increasingly on its information systems require a disciplined approach to the management of those systems”. The vision of Zachman was that business value and agility can best be realized by a holistic approach to systems architecture that explicitly looked at every important issue from every important perspective.

Zachman’s multi-perspective approach to architecting systems is what he originally described as an Information Systems Architectural Framework and soon renamed as Enterprise Architecture Framework. Zachman was a major influence on one of the earliest attempts by the Department of Defense to create an enterprise architecture, known as Technical Architecture Framework for Information Management (TAFIM) and was introduced in 1994. Enterprise Architecture like TAFIM, which aligned technical projects with business need, was noticed by the U.S. Congress and passed a bill in 1996 known as the Clinger-Cohen Act of 1996, also known as the Information Technology Management Reform Act. This act mandated that all federal agencies take steps to improve the effectiveness of their information technology investments. A CIO Council of CIOs from all major governmental bodies was created to oversee this effort. Further works on EA follows thereafter.

One of the success factor to provide health care services in the Philippines is the efficiency and effectiveness of communication that exist among the health care sectors, i.e. Department of Health, insurance companies, health facilities like hospitals and clinics, healthcare professionals, healthcare providers, local government units, patients, and others. Considering the geographical characteristic of the Philippines with isolated islands, healthcare facilities are spread out in different locations. At present, there is no clear connection that exists among health facilities in the way health services are being delivered. Health facilities develop and implement their own processes. This is true in government hospitals where even in the presence of standard operating procedures required by the DOH, there are still some who have their own separate processes and standards. This can be attributed to problems like lack of plantilla position for the needed manpower, and lack of budget among others. Patients are the most affected in this kind of scenario because they have to deal with several persons, units, sections, or departments that have no uniform or standard way of doing things.

The DOH has embarked on computerization since 1988 starting with limited funds coming from the regular budget of the DOH. Improvements were then slow due to the lack of budget and manpower to help in the development and support in the implementation. Budget allotment dramatically increased in the following years for information technology. With the current state of the art technologies like internet, mobile communications, affordable and powerful computers, and overwhelming support from Management, the DOH is committed to bring about improvements in the way services are delivered. Healthcare services are targeted to become easily available or accessible, integrated, interconnected, reliable, efficient and effective.

In the World Health Organization’s presentation of Mr. Mark Landry, Health Information Technology Officer, an EA is defined as a comprehensive and rigorous description of the elements and relationships of an enterprise. The Department of Health is the “enterprise” with collection of programs and functions. The EA is driven by specific requirements of the health sector and enables standards-based and interoperable health information system and e-Health solutions.
The EA in this document is for the DOH which shall serve as a model on which solutions can be developed or built. The DOH EA describes the strategies for aligning the business and Information and Communication Technology (ICT), and its underlying infrastructure. Further, this document presents the current situation of the DOH’s business and ICT setting, and a roadmap on how the DOH can most effectively achieve its current and future objectives in the light of Universal Health Care.

II. ACRONYMS

AHA  Aquino Health Agenda
BHFS  Bureau of Health Facilities and Services
BHs  Barangay Health Stations
BIHC  Bureau of International Health Cooperation
BLHD  Bureau of Local Health and Development
BOQ  Bureau of Quarantine
CHD  Center for Health Development
CMM  Capability Maturity Model
COPD  Chronic Obstructive Pulmonary Disease
CoPs  Community of Practices
DO  Department Order
DOH  Department of Health
DOST  Department of Science and Technology
EA  Enterprise Architecture
FDA  Food and Drugs Administration
FS  Finance Service
GoP  Government of the Philippines
HEMS  Health Emergency Management Staff
HHRDB  Health Human Resource Development Bureau
HPDPB  Health Policy Development Planning Bureau
HSRA  Health Sector Reform Agenda
ICT  Information and Communication Technology
IMS  Information Management Service
IS  Information System
LGUs  Local Government Units
MDGs  Millennium Development Goals
mhealth  Mobile Health
MMD  Materials Management Division
NCDPC  National Center for Disease Prevention and Control
NCHAP  National Center for Health Assistance Program
NCHFD  National Center for Health Facility Development
NCPAM  National Center for Pharmaceutical Access and Management
NEC  National Epidemiology Center
NGOs  Non Government Organizations
NOH  National Objectives for Health
NSCB  National Statistics Coordinating Board
NVBS  National Voluntary Blood Service
OFW  Overseas Foreign Workers
OSC  Office for Special Concerns
PCHRD  Philippine Council for Health Research Development
PD  Procurement Division
PITACH  Philippine Institute of Traditional and Alternative Health Care
POEA  Philippine Overseas Employment Administration
PRC  Philippine Regulations Commission
RHUs  Rural Health Units
SMS  Short Messaging System
III. BUSINESS ANALYSIS – CURRENT SITUATION

A. PHILIPPINE HEALTH SECTOR

The Philippines has a dual health system consisting of the following:

a. **Public Sector** - is largely financed through a tax-based budgeting system national and local level, and where health care is generally given free at the point of services (although socialized user charges have been introduced in recent years for certain types of services). The public health sector consists of the Department of Health, Local Government Units, and other national government agencies providing health services.

The DOH is the lead agency in health where its major mandate is to provide national policy direction and develop national plans, technical standards and guidelines on health. It has a regional field office in every region and maintains specialty hospitals, regional hospitals and medical centers. It also maintains provincial health teams made up of DOH representatives to the local health boards and personnel involved in communicable disease control (NOH, 2005-2010).

With the devolution of health services under the 1991 Local Government Code, provision of direct health services, particularly at the primary and secondary levels of health care, is the mandate of LGUs. Under this set-up, provincial and district hospitals are under the provincial government while the municipal government manages the rural health units (RHUs) and barangay health stations (BHSs). In every province, city or municipality, there is a local advisory body to the local executive and the sanggunian or local legislative council on health-related matters (NOH, 2005-2010).

The passage of the 1995 National Health Insurance Act expanded the coverage of the national health insurance program to include not only the formal sector but also the informal and indigent sectors of the population. The program founded under the principle of social solidarity where the healthy subsidizes the sick and those who can afford to pay subisidize those who cannot. PhilHealth, a government-owned and controlled corporation attached to the DOH, is the agency mandated to administer the national health insurance program and ensure that Filipinos will have financial access to health services (NOH, 2005-2010).

b. **Private Sector** – consists of for-profit and non-profit providers, which are largely market-oriented and where health care is paid through user fees at the point of service. The private sector includes for-profit and non-profit health providers whose involvement in maintaining the people’s health is enormous. Their involvement include providing health services in clinics and hospitals, health insurance, manufacture and distribution of medicines, vaccines, medical supplies, equipment, other health and nutrition products, research and development, human resource development other and other health-related services (NOH, 2005-2010).

B. MANDATE

The DOH is mandated to be the over-all technical authority on health. The major mandate of DOH is to provide national policy direction and develop national plans, technical standards...
and guidelines on health. It is also a regulator of all health services and products; and provider of special or tertiary health care services and of technical assistance to other health providers especially to Local Government Units (LGU). With other health providers and stakeholders, the DOH shall pursue and assure the following:

a. Promotion of the health and well-being for every Filipino
b. Prevention and control of diseases among population at risk
c. Protection of individuals, families and communities exposed to health hazards and risks
d. Treatment, management and rehabilitation of individuals affected by diseases and disability

The 1987 Constitution, Article II, Section 15 declares that “The State shall protect and promote the right to health of the people and instill health consciousness among them. Also, Articles XIII, on Social Justice and Human Rights on Health, declares that it is the responsibility of the State to “adopt an integrated and comprehensive approach to health development which shall endeavor to make essential goods, health and other social services available to all the people at affordable cost. There shall be priority for the needs of the under-privileged, sick, elderly, disabled, women, and children. The State shall endeavor to provide free medical care to paupers” (Section 12); “establish and maintain an effective food and drug regulatory system and undertake appropriate health, manpower development, and research, responsive to the country’s health needs and problems” (Section 12); and “establish a special agency for disabled person for their rehabilitation, self-development, and self-reliance, and their integration into the mainstream of society” (Section 13).

Other statutes depicting the legal mandate of the Department of Health are: Executive Order 102, “Redirecting the Functions and Operations of the Department of Health,” issued by the Office of the President on May 24, 1999; Republic Act 7160, or the Local Government Code; and Executive Order 272, Executive Order 292, Administrative Code of 1987, Section 2, Chapter 1, Title IX. Based on Executive Order 102, issued by the Office of the President in May 24, 1999, the DOH is responsible for and serve as the:

a. Lead agency in articulating national objectives for health, to guide the development of local health systems, programs and services
b. Direct service provider for specific programs that affect large segments of the population, tuberculosis, malaria, schistosomiasis, HIV-AIDS and other emerging infections and micronutrient deficiencies
c. Lead agency in health emergency response services, including referral and networking systems for trauma, injuries and catastrophic events
d. Technical authority in disease control and prevention
e. Lead agency in ensuring equity, access and quality of health care services through policy formulation, standards development and regulations
f. Technical oversight agency in charge of monitoring and evaluating the implementation of health programs, projects research, training and services
g. Administrator of selected health facilities at sub-national levels that act as referral centers for local health systems i.e., tertiary and special hospitals, reference laboratories, training centers, centers for health promotion, center for disease control, and prevention, regulatory offices among others
h. Innovator of new strategies for responding to emerging needs
i. Advocate for health promotion and healthy life styles for the general population
j. Capacity-builder of LGUs, the private sector, non-governmental organizations, peoples organizations, national government agencies in implementing health programs, services, through technical collaborations, logistical support, provision of grants and allocation and other partnership mechanism
k. Lead agency health and medical research
l. Facilitator of the development of health industrial complex in partnership with the private sector to ensure self-sufficiency in the production of biologicals, vaccines and drugs and medicines
m. Lead agency in health emergency preparedness and response;
n. Protector of standards of excellence in the training and education of health care providers at all levels of the health care system
o. Implementer of the National Health Insurance Law - providing administrative and technical leadership in health care financing
p. Expressing national objectives for health to lead the progress of local health systems, programs and services

C. ROLES, POWERS AND FUNCTIONS

Essentially, the DOH has three specific roles in the health sector: leadership in health, enabler and capacity builder and administrator of specific services namely, national and sub-national health facilities and hospitals serving as referral centers, direct services for emergent health concerns requiring complicated technologies and assessed as critical for public welfare and health emergency response services, referral and networking systems for trauma, injuries, catastrophic events, epidemics and other widespread public danger. To accomplish its mandate and roles the Department has the following power and functions based on Executive Order 102:

a. Formulate national policies and standards for health.
b. Prevent and control leading causes of health and disability.
c. Develop disease surveillance and health information systems
d. Maintain national health facilities and hospitals with modern and advanced capabilities to support local services.
e. Promote health and well-being through public information and to provide the public with timely and relevant on health risks and hazards.
f. Develop and implement strategies to achieve appropriate expenditure patterns in health as recommended by international agencies.
g. Develop sub-national centers and facilities for health promotion, disease control and prevention, standards, regulations and technical assistance.
h. Promote and maintain international linkages for technical collaboration.
i. Create the environment for the development of a health industrial complex.
j. Assume leadership in health in times of emergencies, calamities, and disasters and system failures.
k. Ensure quality of training and health human resource development at all levels of the health care system.
l. Oversee financing of the health sector and ensure equity and accessibility to health services.
m. Articulate the national health research agenda and ensure the provision of sufficient resources and logistics to attain excellence in evidenced-based intervention for health.

To perform these functions are the various central bureaus and services and seventeen (17) field offices called Centers for Health Development in every region including specialty hospitals and regional hospitals and medical centers. It also has provincial health teams made up of DOH representatives to local health boards and technical personnel for communicable disease control.

D. VISION STATEMENT

“HEALTH FOR ALL FILIPINOS”
The continuous growth of the economy at a respectable pace over the past four years provides the Philippines with opportunities to improve basic health, nutrition and other related social services. However, poverty remains the major threat in terms of access to essential health services, particularly the increasing disparity in income distribution between the upper income groups and the lower income groups and the continuing disparity between urban and rural areas and among geographical regions of the country. Coupled to these economic and geographic disparities are other internal and external challenges that include the fiscal deficit, the peace and order situation and threat of terrorism, the continuous increase in the price of oil and consequently the price of food and other basic commodities, the emergence of severe acute respiratory syndrome (SARS) and threat of avian influenza, among other factors.

Despite the poverty situation and the other challenges to the health sector, the health of Filipinos generally improved in the past six years as evidenced by the decline in infant and maternal mortality rates, reduction in the prevalence of underweight children, and improvement of life expectancy at birth. Likewise, certain indicators imply better coverage of health and health-related services among the population. Maternal and child health care coverage increased, access to safe water and sanitation facilities improved, micronutrient supplementation and food fortification intensified, and social health insurance coverage expanded. On the other hand, several factors remain as threats to better access to quality health services by the people. Total expenditures on health as a percentage of GNP decreased, distribution of health professionals remains uneven and out-migration continues unabated, high cost of medicines persists, quality assurance of health goods and services remains inadequate, and fragmentation of health systems at local levels persists.

E. MISSION STATEMENT

To ensure accessibility and quality of Health Care to improve the quality of life of all Filipinos especially the poor.

There are basic principles that are necessary for any health system to achieve improvements in health. It includes emphasizing the integral value of health for any nation, the coordination of resources from all sectors, the articulation of the right to access to quality care, and the presence of socio-economic fundamentals.

a. Fostering a strong and healthy nation - Improvements in health provide substantial economic payoffs. Improved health increases productivity and ensures better returns to the factors of production. Healthy workforce means better strength and endurance on the job, fewer days off due to illness, and a longer working life span. Healthy children are better able to learn, have fewer absences in school due to sickness, and reap greater benefits from investments made in their education and skills development that are necessary to prepare them to become productive citizens. Healthy women contribute to the economic well-being of the family. To a large extent, the well-being and proper development of children from the womb to adulthood depends on the health of their mothers. Healthy older people mean lesser burden for
treating costly degenerative and chronic debilitating diseases and a more economically productive older age group.

Moreover, poverty reduction provides a strong rationale for investments in health. The economic gains to the poor from improved health are greater than for their wealthier compatriots, since they bear a higher burden of disease. The income of the poor typically depends on physical labor, and thus illness robs them of a greater portion of their income. Since the poor usually do not have much savings, they find it difficult to recover from ill health without depleting their human and physical capital. Sickness is a major cause of financial crises among the poor. On the other hand, women have special health needs throughout their lives and improving their health can make a significant contribution to their well-being and that of their families. They face a high burden of reproductive health conditions, gender-based discrimination within households in the allocation of resources for nutrition and health care, gender-based violence, and certain environmental and occupational health hazards. Thus, investing in health for the marginalized group provides empowerment necessary to lift them from the vicious cycle of low capital, low income, and poor health. Furthermore, the protection and promotion of good health, the management of health risk behaviors and practices, the prevention of diseases, and the promotion of individual and community responsibility for health provide the major means of reducing the costs of curative care, especially for many illnesses that are expensive to treat. Thus, promoting health and preventing illnesses can free up substantial financial resources that can be used to expand the provision of other cost-effective social services, which in turn further contribute to the development of a strong and healthy nation.

b. Enhancing the performance of the health sector - Political commitment across sectors is essential in improving the effectiveness and efficiency of health systems. Political commitment is raised through consistent involvement of both the national and local governments and their non-governmental partners in all aspects of the health system. Government must provide the leadership and stewardship to ensure that all efforts in the health sector lead to a common goal. Coupled to this, greater support to local health systems development and emphasis on strong management and administrative support systems at all levels of governance contributes to better health sector performance.

Better coordination between national policies and external donor priorities play a major role in fostering harmonization of all external development assistance with domestic priorities and resources. A clearly defined role for public-private-external partnerships in health outlines how these partnerships complement health sector financing and provision of health services and how these partnerships further improve the health of the population. In addition, a focus on improving human resources for health by increasing the number of critical frontline health professionals, correcting mal-distribution and addressing brain drain, improving their management and technical skills, and providing better incentives and rewards for good individual performance further enhances the collective performance of the health sector.

c. Ensuring universal access to quality essential health care - The overall approach to health sector development is ensuring that citizens have broad access to essential promotive, preventive and curative services that are cost-effective, efficacious, and affordable. Increased access to these basic services will have a significant impact on morbidity and mortality in the short to medium term and will provide the foundation for more comprehensive health services in the long term.

Access to health care is better ensured by mobilizing more resources for health, improving efficiency in the production and allocation of health goods and services, and providing social safety nets and addressing inequities specifically among the vulnerable
and marginalized groups. Resource mobilization for health can come about through enhanced revenue efforts and reallocation of more expenditure for health, with emphasis on investments that will preferentially improve the health of the poor, women, children, and other vulnerable groups. Heightened efficiency in the allocation and use of resources is achieved by focusing on the provision of health goods and services that are highly cost effective, address problems that account for a significant proportion of the burden of disease, are of proven benefit, and provide greater advantage to the poor. On the other hand, better quality and affordability of health goods and services are assured by strengthening the mandates and capability of government agencies for health regulation, developing new policy instruments and incentives to promote quality assurance and cost containment measures, and effective management of competition in the health care market.

d. Improving macro-economic and social conditions for better health gains - Further health gains are achieved by improving other socio-economic factors that are generally considered as outside the domain of the health system. Strategies geared toward reducing unemployment and income disparity, eradicating extreme poverty and hunger, ensuring universal primary education, and promoting gender equality and women empowerment are clearly contributory factors that enhance health outcomes.

Improving the economic and social conditions of the vulnerable groups increases their productivity and educability, assets they need to lift themselves from deprivation and discrimination. Such investments reduce inequity and provide them access and the immediate welfare gain of relief from physical suffering and improved health.

F. ORGANIZATIONAL FUNCTIONAL CHART

The following figures describe the current DOH organizational, and resource structure consistent with its new mandate, role and functions and thrusts (Figures 1a and 1b). Figure 1a is based on Executive Order 102 and Figure 1b is the new functional implementation arrangement for Kalusugan Pangkalahatan. Annex A presents the functions of each office in the DOH based on Department of Health (2000), “DOH Rationalization and Streamlining Plan, 2000. The DOH’s structure is based on Executive Order 102 Series of 1999 which granted authority to the DOH to proceed with its Rationalization and Streamlining Plan. The current structure is based on the shift in policy and functions which depicts de-emphasis from direct service provision and program implementation, to an emphasis on policy-formulation, standard setting and quality assurance, technical leadership and resource assistance.

There are more than 120 offices under the DOH. There are eight (8) attached agencies. Also attached to the DOH are 4 specialty hospitals located in the Quezon City Area. These are corporate specialty hospitals on heart (Philippine Heart Center), lung (Lung Center of the Philippines), kidney (National Kidney Transplantation Institute) and children (Philippine Children Medical Center).

At the central office, there are 6 bureaus, 5 centers, 6 services/staff offices. The executive offices are composed of the Office of the Secretary and 3 offices of the undersecretaries and 4 offices of the assistant secretaries. The field offices are composed of sixteen (16) regional health offices popularly known as Centers for Health Development (CHD). In each region, there are at least two (2) tertiary hospitals, i.e. one regional medical center and a regional hospital. Some regions have a sanitarium and/or several general hospitals or medical centers. In the national capital region, there are eleven (11) special hospitals and the four (4) specialty hospitals. The functions of the various offices in Annex A are essentially based on EO 102 and AO 2005-0023 and therefore do not reflect wholly the current Rationalization Plan of the DOH based on EO 366 which is being reviewed by the Department of Budget and Management. The creation of the Food and Drugs Administration through Republic Act 711 from the Bureau of Food and Drugs and Bureau of Devices and Technology created four (4) centers: Center for Drug Regulation & Research, Center for Food Regulation & Research.
Center for Cosmetics Regulation & Research and Center for Device Regulation, Radiation Health and Research.

Figure 1a: DOH Organizational Structure (Executive Order 102)
Figure 1b: Department Order 2011-0188, “Kalusugan Pangkahalatan Execution Plan & Implementation Arrangements”

Legend:

AS - Administrative Service
BHFS - Bureau of Health Facilities & Services
BIHC – Bureau of International Health Cooperation
BLHD – Bureau of Local Health Development
BOQ – Bureau of Quarantine
COBAC – Central Office Bids & Awards Committee
CHD – Center for Health Development
DDAPP – Dangerous Drugs Abuse Prevention Program
DTRC- Drug Abuse Treatment & Rehabilitation Center
EAMC – East Avenue Medical Center
FS – Finance Service
FDA – Food & Drug Administration
HEMS – Health Emergency Management Staff
HRHRB – Health Human Resource Development Bureau
HPDPB – Health policy Development & Planning Bureau
IMS – Information Management Service
IDC – Integrity Development Committee
IAS – Internal Audit Service

LS – Legal Service
MTP – Medical Tourism Program
NCPDC – National Center for Disease Prevention & Control
NCHFD – National Center for Health Facilities Development
NCHP – National Center for Health Promotion
NCPAM – National Center for Pharmaceutical Access & Management
NEC – National Epidemiology Center
PS – Procurement Service
PPPOMO - Public-Private Partnership Management Office
POP – Population Commission
NNC – National Nutrition Council
LWUA - Local Water Utilities Administration
PITAHC-Phil.Institute of Traditional & Alternative Health Care
PHIC – Philippine Health Insurance Corporation
PNAC – Philippine National AIDS Council
PSC – Philippine Sports Commission
PITC-Pharma - Phil. International Trading Corp.- Pharma

DOH-IMS
G. MANAGEMENT AND ORGANIZATION FOR KALUSUGAN PANGKALAHATAN IMPLEMENTATION (FROM DEPARTMENT ORDER # 2011-0188)

1. Being the frontline managers of KP implementation, CHDs shall:
   a. Be responsible for meeting KP performance targets in their respective provinces and cities;
   b. Provide technical assistance to provinces and cities as they implement the three KP thrusts;
   c. Manage resource transfers to leverage LGU counterpart and performance with respect to KP implementation;
   d. Sustain current efforts in the delivery of priority public health services throughout the region while applying increased effort in selected provinces/cities under the MDG breakthrough strategy;
   e. Monitor the performance of provinces and cities in the region with respect to KP implementation;
   f. Prepare region-wide budget execution plans for subsequent years to be submitted for review and endorsement by the Operations Cluster Assistant Secretary/Undersecretary prior to approval by the Secretary of Health; and
   g. Organize a KP team dedicated to managing KP implementation in the provinces and cities under the region.

2. The CHD Regional Director shall be accountable to the Secretary of Health, through the Operations Cluster Assistant Secretary/Undersecretary.

3. Being the overall managers of KP implementation for a cluster of regions, the Operations Cluster Assistant Secretaries/Undersecretaries shall:
   a. Be responsible for meeting cumulative KP targets in their respective areas;
   b. Ensure that technical assistance from the technical clusters is available and delivered to the regions in a well-coordinated manner;
   c. Facilitate the flow of resources, as well as manage its allocation and transfers among its regions;
   d. Review and endorse regional budget execution plans, for approval by the Secretary of Health;
   e. Validate and consolidate performance monitoring reports for the Execom; and
   f. Represent the Secretary of Health with respect to matters concerning KP implementation in the Operations Cluster.
   g. Technical Clusters based at the Central Office shall provide technical support to KP implementation. Bureaus, offices and units shall be organized around the following clusters with their respective tasks.

4. The Sector Finance and Policy Technical Cluster shall:
   a. Consolidate national level performance regarding KP targets on NHIP Benefit Delivery Ratio, Health Facilities Enhancement; and MDGs;
   b. Consolidate overall resource requirements to implement KP from all sources, including the General Appropriations Act, NHIP, and Foreign Assistance Projects;
   c. Ensure that technical assistance capacities, packages, and tools are available to support the requirements of the Operations Clusters in implementing KP;
   d. Develop measures, and a collection, validation, and reporting scheme for monitoring the performance of KP implementation;
   e. Determine national level targets with area, regional and provincial breakdowns for KP implementation;

DOH-IMS
f. Represent the Secretary of Health with respect to engagements with the Department of Finance and Department of Budget and Management in matters related to financing KP implementation; and

g. Perform the following with respect to the catch-up and scale-up phases of the KP roadmap:
   i. Propose changes in the National Health Insurance Act Implementing Rules and Regulations (e.g., LGU sharing, new sponsored program, OPB-NBB, IP NBB, membership services, rules on reserves, use of 12 percent administrative cost, operationalize BDR, and others);
   ii. Develop a new budget preparation cycle and procedures;
   iii. Develop a new HFEP framework and delivery mechanism;
   iv. Build a listing of the universe of public and private OP and IP providers;
   v. Develop an operations plan for the MDG breakthrough strategy.

Units in the SFPTC shall be:

a. DOH Units:
   i. Bureau of International Health Cooperation
   ii. Health Policy Development and Planning Bureau
   iii. National Center for Health Promotion

b. Attached Agencies:
   i. Philippine Health Insurance Corporation
   ii. Philippine National AIDS Council

5. The Internal Finance and Administration Technical Cluster shall:

a. Consolidate annual budget execution plans;
   b. Perform timely and regular monitoring of budget expenditures through the Expenditure Tracking System;
   c. Facilitate the timely release of funds and delivery of commodities to CHDs;
   d. Develop guidelines for the engagement and deployment of doctors to the barrios, RNheals nurses, and other personnel in support of KP implementation;
   e. Represent the Secretary of Health with respect to engagements with the DBM in matters related to budget execution and expenditure tracking;
   f. Develop a CHT deployment and training plan; and
   g. Perform the following with respect to the catch-up and scale-up phases of the KP roadmap:

      i. Train RNheals nurses as trainers for CHTs;
      ii. Identify and assign KP implementation tasks for DTTBs; and
      iii. Intensify and expand use of the ETS as a platform for all financial transactions from central office, to CHDs, hospitals and provinces.

Units in the IFATC shall be:

DOH Units

   a. Administrative Service
   b. Finance Service
   c. Health Human Resources Development Bureau
   d. Information Management Service

6. The Support to Service Delivery Technical Cluster shall:
a. Assist CHDs in the operationalization of the new HFEP;
b. Develop and assist CHDs in the operationalization of a new approach to province-wide agreements for KP performance;
c. Develop methods and assist CHDs in validating service delivery outcome measures including, among others, modern family planning use, facility based deliveries, TB case detection and cure, and others; and
d. Develop a sustainable approach to secure access to essential life savings medicines for NHTS-PR families.

Units in the SSDTC shall be:

a. DOH Units:
   i. Bureau of Health Facilities and Services
   ii. Bureau of Local Health Development
   iii. Health Emergency Management Staff
   iv. National Center for Disease Prevention and Control
   v. National Center for Health Facilities Development
   vi. National Center for Pharmaceutical Access and Management

b. Attached Agencies:
   i. Commission on Population (POPCOM)
   ii. National Nutrition Council (NNC)

7. The Technical Cluster Assistant Secretary/Undersecretary shall review policy issuances, guidelines, and protocols developed by the offices and bureaus, prior to endorsement to the ExeCom for discussion and approval by the Secretary of Health.

8. Offices, bureaus, and units in the Technical Clusters shall provide technical assistance related to KP implementation, through the respective Technical Cluster Assistant Secretary/Undersecretary. Conversely, requests by the CHDs for support related to KP implementation from offices, bureaus and units under the various technical clusters shall be coursed through their respective Operations Cluster Assistant Secretaries/Undersecretaries.

9. KP implementation tasks for the following units shall be issued directly by the Secretary of Health:

a. Special Concerns Technical Cluster includes the following offices:
   i. Dangerous Drugs Abuse Prevention Program
   ii. Drug Treatment and Rehabilitation Centers
   iii. Medical Tourism Program
   iv. Sanitaria
   v. Food and Drug Administration (FDA);

b. Office of the Secretary Support includes the following offices:
   i. Bureau of Quarantine
   ii. Central Office Bids and Awards Committee
   iii. Internal Audit Service
   iv. Integrity Development Committee
   v. Legal Service
   vi. National Epidemiology Center
   vii. Public-Private Partnership Management Office
   viii. Procurement Service
IV. THE AQUINO HEALTH AGENDA


Health-related public policies and laws have provided the impetus for comprehensive reform strategies identified in the Health Sector Reform Agenda launched in 1999 and its implementation framework, the FOURmula One (F1) for Health in 2005. Since then, substantial gains in health sector improvements have been achieved in the areas of social health insurance coverage and benefits, execution of Department of Health budgets and its use to leverage local government unit performance, LGU spending in health, systematic health investment planning through the Province-wide Investment Plan for Health / Citywide Investment Plan for Health / Annual Operational Plan process, capacities of government health facilities, and the implementation and monitoring of public health programs.

However, poor Filipino families have yet to experience equity and access to critical health services, despite all of these achievements. There is a need to increase PhilHealth enrolment coverage, improve availment of benefits, and increase support value for claims in order for the National Health Insurance Program to provide Filipinos substantial financial risk protection; upgrade public hospitals and health facilities to expand capacity and improve quality of services; strengthen management and compensation of human resources for health; and strengthen health information systems to guide planning and implementation of health programs. The Philippine’s target on the Millennium Development Goals is lagging behind in reducing maternal and infant mortality.

To address the challenges, the Aquino Health Agenda was launched to improve, streamline and scale up reform interventions espoused in the HSRA and implemented under F1. This deliberate focus on the poor will ensure that as the implementation of health reforms moves forward, nobody are left behind. To successfully implement the Aquino Health Agenda, the Philippine health system requires the following components: enlightened leadership and good governance practices; accurate and timely information and feedback on performance; financing that lessens the impact of expenditures especially among the poorest and the marginalized sector; competent workforce; accessible and effective medical products and technologies; and appropriately delivered essential services.

Administrative Order # 2010-0036 dated December 16, 2010 provided the objectives, thrusts, and implementation framework to implement the UHC.

Overall Goal:

Ensure the achievement of the health system goals of better health outcomes, sustained health financing and responsive health system by ensuring that all Filipinos, especially the disadvantaged group in the spirit of solidarity, have equitable access to affordable health care.

General Objectives:

1. To improve, streamline, and scale up the reform strategies in Health Sector Reform Agenda and Fourmula 1 for Health in order to address inequities in health outcomes by
ensuring that all Filippinos, especially those belonging to the lowest two income quintiles, have equitable access to quality health care.

2. To strengthen the National Health Insurance Program as the prime mover in improving financial risk protection, generating resources to modernize and sustain health facilities, and improve the provision of public health services to achieve the Millennium Development Goals.

The Aquino Health Agenda is a focused approach to health reform implementation in the context of HSRA and F1, ensuring that all Filipinos especially the poor receive the benefits of health reform. AHA shall be attained by pursuing three strategic thrusts:

1. **Financial Risk Protection** through expansion in NHIP enrollment and benefit delivery – the poor are to be protected from the financial impacts of health care use by improving the benefit delivery ratio of the NHIP.

2. **Improved Access to Quality Hospitals and Health Care Facilities** – government-owned and operated hospitals and health facilities will be upgraded to expand capacity and provide quality services to help attain MDGs, attend to traumatic injuries and other types of emergencies, and manage non-communicable diseases and their complications.

3. **Attainment of the Health-Related MDGs** – public health programs shall be focused on reducing maternal and child mortality, morbidity and mortality from TB and malaria, and the prevalence of HIV/AIDS, in addition to being prepared for emerging disease trends, and prevention and control of non-communicable diseases.

Six (6) strategic instruments were identified to be optimized to achieve the AHA strategic thrusts:

1. **Health Financing** – instrument to increases resources for health that will be effectively allocated and utilized to improve the financial protection of the poor and the vulnerable sectors.

2. **Service Delivery** – instrument to transform the health service delivery structure to address variations in health service utilization and health outcomes across socio-economic variables.

3. **Policy, Standards and Regulation** – instrument to ensure equitable access to health services, essential medicines and technologies of assured quality, availability and safety.

4. **Governance for Health** – instrument to establish the mechanisms for efficiency, transparency and accountability and prevent opportunities for fraud.

5. **Human Resources for Health** – instrument to ensure that all Filipinos have access to professional health care providers capable of meeting their health needs at the appropriate level of care.

6. **Health Information** – instrument to establish a modern information system that shall:
   a. Provide evidence for policy and program development
   b. Support for immediate and efficient provision of health care and management of province-wide health systems

The success of AHA shall be measured by the progress made in preventing premature deaths, reduce maternal and newborn deaths, controlling both communicable and non-communicable diseases, improvements in access to quality health facilities and services and increasing NHIP benefit delivery rate, prioritizing the poor and the marginalized (such as the Geographically Isolated and Disadvantage Area population, indigenous population, older persons, differently-abled persons, internally-displaced population, and people in conflict-affected areas). These
performance measures are the results of an effective interaction between families and health care providers (both public and private) in local health systems.

V. ORGANIZATIONAL FUNCTIONAL INTERFACE CHART

Figure 2.0 shows the different agencies, offices, institutions, clientele, stakeholders, and beneficiaries that generally help and/or contribute in the attainment of the DOH’s vision, mission and mandate.
Figure 2: Organizational Functional Interface Chart

Department of Health

- Schools
- Regional Offices
- Local Government Units
- Attached Agencies/Bureaus (PHIC, BFAD, NNC, PITAHC, DDB)
- Government Partners or Clients
- Development Partners/Financing Institutions
- Government Regulatory Bodies
- Other Government Units
- International Community
- General Public
- Service/Product Providers
- Non-Government Organizations
- Legislative Bodies
- Other Government Units

Requests - Proposals - Requirements - Contracts - Memoranda - Funds
Policy Studies
Requests - Applications
Payments
Information - Products - Services
Position Papers - Legislative Proposals
Rules & Regulations - Memoranda
Reports - Requirements - Funds
Overseas Studies
Alliances - Proposals

Assistance - Referral
Plans - Policies - Programs
Reports - Proposals - Requirements
Assistance Requested
Alliances Proposals
Training - Scholarships

DOH-IMS
VI. TECHNOLOGY ANALYSIS – CURRENT SITUATION

The use of ICTs in the DOH has remarkably supported and improved some of the functions of the Department. ICTs have been used in the areas of innovative technological changes, networking and infrastructure, office automation, development and implementation of computer-based systems. From the limited resources in terms of ICT personnel and funds, the DOH Management has augmented the budget on ICT to fully accomplish and support the ICT strategic goals and direction. Contractual ICT personnel were hired to render technical assistance or help desk support in the implementation or operationalization of several information systems in the DOH.

In 2005, the DOH through the Information Management Service has formulated the standard policies, procedures, and guidelines governing all ICT works in the Department through Department Order (DO) No. 2005-0032. The Order directs all central and regional offices, and retained hospitals to submit all ICT-related works to IMS for evaluation. The evaluation process checks on compliance to the ICT standards of the Department to ensure continuing maintenance and/or sustainability, reduce or eliminate duplication of information systems, maximize resources, and implement efficient and effective solutions to address existing problems, issues and concerns.

Duplication will occur if the systems to be developed will not pass the review and evaluation of IMS. The DOH has joined the coalition to advocate for health information systems strengthening, integration and harmonization (Health Metrics Network). At present, one major and critical challenge being faced by the DOH is the integration or harmonization of all existing information systems and data as well.

The integration of all existing information systems and data sources will eventually address other challenges like establishment of the DOH data warehouse, quality database and establishment of a more responsive information system and access to and sharing of knowledge products. The current level of computerization in the Department has greatly improved over the past years but limited. There are increases in the number of computerized information systems developed and implemented to address the mission critical or frontline services, significant increases in number of personnel trained for office automation, and continuous demand of offices to computerize their operations, workflows and/or reporting systems. Several regulatory subsystems are in place such as hospital licensing and X-ray facilities and some are under enhancement or development namely drug testing and regulations of food and drugs. The Hospital Operations and Management Information System is quite developed and is being roll-out. Registries for several diseases of public health importance are also in place.

The Department has also established its website and portal, and has started incorporating web-technology solutions in developing information systems including development of e-health applications. However, some hospitals have not developed their own websites. In terms of office automation, the central office has a very high percentage of ICT literacy especially among technical staff, followed by the CHDs and the hospitals.

The use of ICT in the Department has to be further exploited to enhance productivity, improve efficiency, ensure greater transparency, effectiveness and accountability in operations. There is a need to facilitate and/or improve access to and sharing of health, medical information, knowledge and locally relevant content resources for strengthening public health research, disease prevention and control, regulation of services and policy development. Current information systems, data sources, and databases need to be integrated and harmonized. Health care and health information and/or knowledge have to be extended to remote and underserved areas and vulnerable populations to promote equitable, affordable and universal access to health care and knowledge. The Department has to promote and/or expand further its collaboration efforts with other governments, planners, health professionals and other agencies along with the participation of international organizations to create a more reliable, timely, high quality and affordable health care and useful health information systems, promote continuous medical training,
education, and research etc. through the use of ICT with respect and compliance to security and protection of citizen’s right to privacy.

VII. SWOT ANALYSIS

A. STRENGTHS

a. Improved collaboration with the different government agencies and institutions as evidenced by the creation of the Philippine Health Information Network and Philippine National Injury Data Management System.
b. Strong Leadership by Management
c. Creation of the Administrative Order on Universal Health Care to support the Aquino Health Agenda
d. Presence of Information System Strategic Plan
e. Presence of Standard Policies, Procedures and Guidelines Governing ICT Works in the Department of Health
f. Presence of Information Management Service - Central ICT Arm of the DOH
g. Institutionalization of Good Governance Systems
h. Increase budget to fund ICT projects

B. WEAKNESSES

a. Lack of plantilla position for system development, maintenance and technical support
b. Poor data quality
c. Lack of standards on interoperability and data sharing
d. Difficulty in reporting timely and relevant information
e. Low utilization of health information
f. Weakness in data analysis

C. OPPORTUNITIES

a. Recognition and adoption of EA to enhance ICT in the DOH
b. Emerging technologies to automate or support business processes
c. Move towards System Harmonization and/or Interoperability

D. THREATS

a. Rapid changing technology
b. Absence of internet connection in remote sites
c. Competition for ICT Development

VIII. GAP ANALYSIS

From the SWOT, gaps were analyzed and recommendations were made that steered the development of the DOH EA.
a. Strengthen health information exchange across all health sectors: There were already initial efforts done to fortify health information exchange, i.e. Establishment of the National Health Data Dictionary and the Unified Health Management Information System, and use of xml as the standard data format. In addition there is still the need to establish mechanisms to ensure timely and secured transfer of data or information between the DOH and other health sectors.

b. Continuing automation or computerization of business processes.

c. Continuing upgrade of the DOH network infrastructure to be able to collaborate effectively and successfully implement automated systems or solutions. A government wide area network infrastructure or other forms is needed to support this recommendation.

d. Strengthen mechanisms to protect or secure the data or information. In terms of privacy, patient-related data must be made available at point of need to those with a need to know taking into account that the patient has the right to restrict his/her information.

e. Bring together data from different sources.

f. Harmonize business processes.

g. Respond to requests or services quickly with satisfying results. Trust builds stronger relationship which makes systems usable or implementable with the data being formed or generated. Thus, this provides the foundation for electronic healthcare services in the country.

IX. ENTERPRISE ARCHITECTURE CONCEPTS

The Department of Health has utilized information and communication technologies (ICT) to improve public sector health service delivery. The use of ICT in the DOH has started to improve the delivery of services to the citizens, interactions with the various stakeholders, citizen empowerment through access to information, and good governance. The expected results can be encapsulated in three words, i.e. efficiency, effectiveness and responsiveness, where these are all recipe of organization and information technology transformation through the DOH’s Information System Strategic Plan in which organizational vision, mission, goals, functions, processes, manpower, information systems, network, databases, hardware, and governance are packaged. Increasing the effectiveness and quality of health services is not only a matter of employing leading edge technologies but needs visionary leadership, clear objectives, and sound implementation strategy. The implementation of information systems in the DOH has built four (4) areas of interactions, i.e. DOH to Customer (D2C), DOH to Business (D2B), DOH to Other Government Agencies (D2G), and DOH to Employee (D2E). In these four areas, there is an increasing trend towards cross enterprise interactions.

To start the presentation of the DOH Enterprise Architecture, it is important to have a clear definition what an EA is. EA is defined as the organizing logic for an organization’s core business processes and information technology capabilities captured in a set of policies and technical options to achieve standardization and integration of the organization’s operating model. An organization’s EA specifies the business and technical governance platform on which the enterprise designs and builds its IT systems to achieve its objectives. Further, an EA will effectively support the business, enable information sharing, enhance the ability to deliver quality services, and improve operational efficiencies through effective use of ICT.
In the first quarter of this year 2011, the DOH has been assessed by the Asian Development Bank in collaboration with the Commission on Information and Communication Technology on its e-government maturity. An e-government Competency Maturity Model developed by ADB and its development partners namely, United Nations Asian and Pacific Training Center for ICT for Development, National Information Society Agency of South Korea, International Enterprise Singapore, and Microsoft, has been used in the assessment process. The CMM is a set of criteria called critical variables describing and specifying standards on specific domains in ICT. It has a scoring system that enables an organization to assess what level it is in these standards using a 5-level scoring system. The tool integrates the full range of capabilities necessary to implement e-government, including Strategy Alignment, IT Governance and Processes and Organizational Change Management and Business Transformation Readiness. Figure 3.0 shows the DOH’s Scores for the CMM.

The achievements or benefits that the DOH derived from the use of ICT increased together with the required resource investments. Thus, there is a trade-off and balance between benefits and investments. The DOH faces continuing challenges as it advances further in using ICT to realize its optimum benefits. Greatest value can be gained in using internet technology to deliver health information and services, and advance the capability and maturity of the DOH. Visionary Leadership, enterprise architecture and common standards, improved accessibility and security, protection of privacy and identity, organizational acceptance and commitment to change and process transformation, collaboration, and good governance are key ingredients to increase the success of advancing further.
Figure 3: DOH Organizational Capability Level using the Competency Maturity Model developed by the Asian Development Bank
A. OBJECTIVES

The DOH EA has the following objectives:

a. Facilitate consolidation of systems and architecture.
b. Promote interoperability by providing a means for communication and coordination of electronic data among the various health domains.
c. Increase accountability and ownership of data and information.
d. Harmonize and optimize processes and workflows to achieve integrated health care.
e. Serve as reference in the development of integrated information systems.
f. Promote the use of standards to support the objectives of the Department.

B. SCOPE

a. The DOH EA is national in perspective, i.e. not only internal to the Department but also the external environment, i.e. the entire Philippine Health Sector.

b. The design of the DOH EA is a high level conceptual architecture where the infrastructure services will be identified and described. Outside the scope of the DOH EA are the details on architectural decisions on products and vendors, analysis of the application systems, in-depth business process analysis of the DOH, in-depth data analysis identifying common entities and data elements, and comprehensive analysis of information. Details on these will be discussed in separate documents.

c. The implementation plan for this architecture is not included in the document; Only the DOH EA strategic actions are included.

C. APPROACH

The architecture process or approach that was adopted is the WHO Enterprise Architecture Cycle. It consists of steps from Architecture Vision to Architecture Change Management (See Annex 4).
Figure 4: WHO Enterprise Architecture Cycle

D. GUIDING PRINCIPLES

Principle 1:

Client or People Centric which focused on meeting the needs of the entire citizenry where the following sub principles shall be strongly uphold:

a. Right to choose the path or channel for doing business with the DOH
b. Ease of understanding DOH services, and clear understanding of the duties and responsibilities of the people
c. Ease of access to DOH’s products and services, and how the DOH operates
d. Right to quality information, i.e. accurate, complete, reliable, and timely
e. Right to security and confidentiality of data and information
f. Right to be updated on informed about the status of health services being undertaken

g. Ease of providing feedback to the DOH to report shortcomings, mistakes, or other forms of complaints

h. Ability to evaluate the performance of the DOH

i. People empowerment to look after their concerns and the DOH promotes and encourages participation and provides the necessary means

**Principle 2:**

Function Driven where the offices’ perspectives will have greater and long term value.

**Principle 3:**

Data Driven where data can be delivered as to when, where, and how needed to support the requirements of the users.

**Principle 4:**

Standards Driven for better interoperability of systems, ease of transfer, ease of harmonization and/or integration, and optimal use of resources.

**Principle 5:**

Interoperability and Reusability of systems whenever there are changes and new mandates.

Designing systems to interoperate based on reusable component services will optimize resources, reduce redundancy, and allow systems to adapt to changing requirements.

**Principle 6:**

Resilience where systems are built to be stable, reliable, maintainable, flexible, robust and extensive enough to meet the requirements of the organization

**Principle 7:**

Compliance to Laws, Rules and Regulations to continuously achieve its mandates

**Principle 8:**

Ownership Driven to achieve real value and support in implementation.

**Principle 9:**

Security Driven to protect the systems and information from unauthorized access, changes or destruction
The implementation of Universal Health Care shall be directed towards ensuring the achievement of the health system goals of better health outcomes, fair health financing and responsive health system by ensuring that all Filipinos, especially the disadvantaged group, have equitable access to health care.

Its objective is to promote equity in health through the provision of full financial protection and improvement of access to priority public health programs and quality hospital care especially for the poor. Specifically, it aims to utilize the instruments of Health Financing, Health Service Delivery System, Human Resources for Health, Health Regulation, Governance for Health and Health Information to achieve the strategic thrusts.

**Enterprise Vision:**

To efficiently and effectively harness Information and Communication Technology to help achieve the DOH's thrusts.

Current thrust is on Universal Health Care, specifically on the following:

1. **Refocused PhilHealth** - Financial risk protection through improvements in NHIP benefit delivery

   1. Redirecting PhilHealth operations towards the improvement of the national and regional benefit delivery ratios
2. Expanding enrolment of the poor NHIP to improve population coverage

3. Promoting the availment of quality outpatient and inpatient services at accredited facilities through reformed capitation and no balance billing arrangements for sponsored members, respectively

4. Increasing the support value of health insurance through the use of information technology upgrades to accelerate PhilHealth claims processing, and others

5. Continuing study to determine the segments of the population to be covered for specific range of services and the proportion of the total cost to be covered/supported

d. **Upgrading of Health Facilities** - Improved access to quality hospitals and other health care facilities

1. A targeted health facility enhancement program that shall leverage funds for improved facility preparedness to adequately manage the most common causes of mortality and morbidity, including trauma

2. Provision of financial mechanisms drawing from public-private partnerships to support the immediate repair, rehabilitation and construction of selected priority health facilities

3. Fiscal autonomy and income retention schemes for government hospitals and health facilities

4. Unified and streamlined DOH licensure and PhilHealth accreditation for hospitals and health facilities

5. Regional clustering and referral networks of health facilities based on their catchment areas to address the current fragmentation of health services in some regions as an aftermath of the devolution of local health services

e. **Attainment of Millennium Development Goals (4, 5, and 6)**

1. Deploying Community Heath Teams that shall actively assist families in assessing and acting on their health needs

2. Utilizing the life cycle approach in providing needed services, namely family planning; ante-natal care; delivery in health facilities; essential newborn and immediate postpartum care; and the Garantisadong Pambata package for children 0-14 years of age

3. Aggressively promoting healthy lifestyle changes to reduce non-communicable diseases

4. Ensuring public health measures to prevent and control of communicable diseases; and adequate surveillance and preparedness for emerging and re-emerging diseases

5. Harnessing the strengths of inter-agency and inter-sectoral cooperation to health especially with the Department of Education and Department of Social Welfare and the Department of Interior and Local Government.

**F. HEALTH SECTOR GROUPS**
The Philippine Health Sector is a complex network of various actors with relationships, processes, and activities. Each has different roles, capabilities, interests, and incentives operating under a governance structure. To facilitate the referral of these actors in the context of the DOH EA, they will be group according to roles, namely:

<table>
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<tr>
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<th>Purchasers of Healthcare</th>
<th>Individuals, Employers</th>
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<tbody>
<tr>
<td>a</td>
<td>Producers</td>
<td>Drug Companies, Medical Suppliers, Information</td>
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<tr>
<td></td>
<td></td>
<td>Technology Suppliers, Facility Maintenance</td>
</tr>
<tr>
<td>b</td>
<td>Distributors</td>
<td>Wholesalers, Shippers</td>
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<tr>
<td>c</td>
<td>Financial Services</td>
<td>Insurers, Health Maintenance Organizations,</td>
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<td></td>
<td></td>
<td>PhilHealth</td>
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<tr>
<td>d</td>
<td>Healthcare Providers</td>
<td>Physicians, Nurses, Hospitals, Clinics, Other</td>
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<td></td>
<td></td>
<td>Healthcare Providers</td>
</tr>
<tr>
<td>e</td>
<td>Academe</td>
<td>Schools, Learning Institutions</td>
</tr>
<tr>
<td>f</td>
<td>Government Agencies</td>
<td>National Agencies other than the Department of</td>
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<td></td>
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<td>Health</td>
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<td>g</td>
<td>Local Government Units</td>
<td>Office of the Governor, Mayors, Councilors,</td>
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<td></td>
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<td>Barangay Captain, and the like</td>
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<td>Sellers</td>
<td>Pharmacies, Botikas</td>
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<td>Donors</td>
<td>Funding Agencies like World Health Organization,</td>
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<td>Asian Development Bank, USAID, WB, and other</td>
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<td>j</td>
<td>International Groups</td>
<td>Foreign Countries and Organizations</td>
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<td>Non Government Groups</td>
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<tr>
<td>l</td>
<td>Lawmaking Bodies</td>
<td>Congress, Senate, and others</td>
</tr>
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X. **DOH’S ENTERPRISE ARCHITECTURE**

Strengthening health systems and improving the efficiency and effectiveness of the health service delivery depend on the following types of information:
a. **Operational Data** - supports the routine activities of the health system. Examples are patients’ medical records for effective health care, inventory record for tracking medicines, and others.

b. **Summary Data** – is based on indicators to manage the resources of the health system. This data can help set policies and evaluate the performance of health programs.

The DOH collects data based on set of indicators like number of fully immunized children, and number of maternal and child deaths; stores the data from various disparate sources into a single data store or warehouse; consolidates, analyzes and provides reports. Further, the DOH recognizes the information needs of the different health sector groups and the importance of sharing information among themselves. The flow of information does not take place within one organization or single application but between organizations using different processes and automated systems or software for the management of information relevant to their respective functions. When information on birth is added by a doctor to the patient’s health record, data is reported for vital registration and immunization data to the DOH. If the mother is HIV positive, then the child needs to undergo laboratory tests, and follow up visits need to be scheduled by the doctor. Thus, the flow of information moves up, down, and across the health system.

Information needs to be made available where it is needed. The DOH expects information technology to deliver business or mission value, produce concrete improvements in the effectiveness of health programs being implemented, and support rapid response to change with optimal economy of effort, efficiency in action, energy in execution, and efficacy of impact. This is where the DOH’s Enterprise Architecture comes in, i.e. process of translating the DOH’s vision and strategy into effective enterprise change, and determining the architectural style to respond to rapid and

The goal of the DOH EA is not only to collect or aggregate data, nor establish one central repository of all the data but to optimize information flows among the different health sector groups. The optimization of information flows helps determine what information is needed and where to get the information. Information and Communication Technology can provide the means to join different systems and share data.

Thus, the design of the DOH EA adopts the **Federal Service Oriented Architecture** which focuses on business processes and standardization to facilitate the organization, development and implementation of multiple system elements like the application itself, interfaces, and services. The sharing of information to other entities, i.e. customer-patient, government agencies, academe, local government units, non-government organizations, and others is needed to promote greater efficiency and minimum duplication in processes and systems. The DOH opted to use a SOA to structure and coordinate the sharing of information both at the level of processes and technologies. There is a continuing demand for the DOH to further improve its health services to be at par with the private sector. In general, customer-patient and the entire Philippine Health Sector want to interact quickly with the DOH and get quality and transparent service level.

There were noticeable accomplishments in the development and implementation of information systems using client-server technology, development of the DOH Website or Portal, migration to developing web-based application systems, and development of the e-Health Framework. Less visible were the initiatives and accomplishments of the DOH in establishing the National Health Data Dictionary, Unified Health Management Information System, Interoperability Standards, and move to web services in a service-oriented architecture.
The DOH adopts the federated architecture, an approach to enterprise architecture that allows interoperability and information sharing between several organized lines of businesses, and information systems and applications.

In a SOA, a service is defined as a complete performance of a process or business in question. It includes processes, responsibilities and liabilities as well. The emergence of web services technology has increased interest in using the SOA model. SOA is more than an IT related implementation. The service concept will facilitate understanding and communication among the various players in the health sector, address issues on interoperability, responsiveness, innovation and cost effectiveness. From the organizational perspective, the basic unit for management and control is no longer an office or division with its own IT systems but rather a smaller entity, which may be called as a **DOH service**. The concept of each office or division developing its own systems will cease, and system owners will lose control over what they believe was their own operation or system. The decomposition paves the way for combining health services into new and better demand or event-driven ensembles.

Processes to support the functions of the DOH are subdivided into independent DOH services. The services can be called upon when and where needed, thus uncoupling the use of services and the services themselves for greater flexibility. In developing applications, these services can be reused. To better understand the applicability of SOA in the DOH, there are application systems that require a log-in. Previously, programmers had to design and build the security structure, a program to manage or administer the users, and a log-in program to capture the username and password. A common service will be constructed and tested for the log-in system or module, such that programmers need not develop their own. Thus, other common and program specific services can be developed. In a SOA environment, this log-in service is already available and can be reuse. Developing applications using SOA is a process of creating and using services. As more services are to be built by the DOH, applications will become a collection of services. The DOH is not alone in moving in this SOA direction. The Ministry/Department of Health in other countries has already adopted the SOA, whereas some have started their intent to deploy a SOA.

Through SOA, reusing and sharing of services will significantly reduce development time and purchase or contracting out of redundant systems. If a process changes, application systems in a SOA environment can adapt quickly by changing the affected component services. Thus, the entire process becomes more flexible and adaptable to meet the ever-increasing changes in health related information technology.
Figure 5: DOH Enterprise Architecture

**Users**
- Purchasers of Healthcare
- Producers
- Distributors
- Financial Services
- Healthcare Providers
- Acade
- Gov’t Agencies
- Donors
- LGUs
- Int’l Groups
- Non Gov’t Orgs
- Lawmaking Bodies

**Service Access and Delivery**
- Authentication - Single Sign On
- Internet - Intranet
- Access Channels

**Applications - Web Services**
- Philippine Health Information System
- Frontline Services
- Regulations
- Pharmacy Services
- Community Based Services
- Disease Registries
- Surveillance
- Health Finance & Insurance
- Emergency Response
- Health Supply Chain
- Health Service Delivery
- Diagnostic Services
- Environmental Monitoring
- Human Resources in Health

**Knowledge Management**
- Common Service Components
- Identity Management
- Authentication – Single Sign ON
- Directory Services
- Forms & Services
- Payment Services
- Inquiry Services
- Document Management
- Inventory Management
- User Account Management
- Registration
- Enrollment
- Reporting Tools
- Others

**e-Health Infrastructure**
- Terminology & Classifications
- Data Interchange Interoperability & Accessibility
- Privacy & Confidentiality
- National Health Data Dictionary

**Information & Communication Technology Infrastructure**
- Facilities & Equipment
- Communication Infrastructure
- Storage
- Servers & Computers
- Delivery Servers
- Networks
- Application Development
- Desktop Hardware
- Operating Systems & Other Software
- Technical Professionals

**Security**
XI. REFERENCE MODEL

In the design of the DOH EA, a Reference Model was used to define the scope, content, rules and processes subsumed in developing the DOH EA. The RM is a set of references that included the following:

a. Business Reference Model
b. Application Reference Model
c. Data Reference Model
d. Technical Reference Model
e. Performance Reference Model

The five (5) reference models serve as the foundation of the DOH EA.
## XII. MODEL AND PRINCIPLES

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<tr>
<th>#</th>
<th>EA Reference Model</th>
<th>Description</th>
<th>Contents</th>
<th>Principles</th>
</tr>
</thead>
</table>
| a | Business Reference Model | A view of the DOH’s lines of business and constituent parts | · Principles  
· Vision and Mission  
· High Level Goals and Objectives  
· Organizational Structure  
· Functions and Processes  
· Policies  
· Work Flows | · Business processes must comply with pertinent laws of the Philippines, existing policies, rules and/or regulations. The DOH shall abide by all laws, policies, rules and/or regulations of the Philippines.  
· The management of health information must apply to the entire health sectors. Complying with this principle will provide a more reliable and quantifiable measurement of the level of quality and information across the health sectors.  
· Processes must be shared across departments, organizational boundaries, and/or the entire health sectors. To attain the DOH’s intended objectives or goals requires changes in organizational planning and management of information. Offices must give up individual preferences for the benefit of the entire DOH.  
· Health services, functions, or processes must be continuous to serve the entire citizenry regardless of internal or external events and must have options or substitute mechanisms. Nothing must hamper or disrupt the DOH’s business activities, i.e. natural disasters, hardware or internet failure, and others. Business functions must continue even to the extent of using alternative methods.  
· Common applications must be used and enhanced to eliminate duplication and optimize the use of scarce resources. Processes must be standardized to come up with use of common applications.  
· Offices develop and implement technology solutions or |
**Department of Health – Enterprise Architecture**

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<tr>
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<tbody>
<tr>
<td><strong>b</strong></td>
<td>Application Reference Model</td>
<td>Classification of service components according to how they support business goals and performance. Defines the application portfolio. Services, information and functionalities that cross organizational boundaries, connecting users of different functions and skills to achieve common objectives.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Software Applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Integration, Interactions and/or interdependencies of the applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o User Interfaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Process Alignment</td>
</tr>
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<td></td>
<td></td>
<td>o Information Exchange</td>
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<td></td>
<td>o Middleware</td>
</tr>
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<td></td>
<td></td>
<td>o <strong>Applications are technology independence.</strong> This principle will allow applications to be developed, upgraded, and operated in the most timely and cost-effective manner.</td>
</tr>
<tr>
<td><strong>c</strong></td>
<td>Data Reference Model</td>
<td>Classification of data to support sharing and use of data. Describes what the service needs to know to run the business processes. Includes conceptual model, relationship model, system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Data Models</td>
</tr>
<tr>
<td></td>
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<td>o Data Management</td>
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<tr>
<td></td>
<td></td>
<td>o Data Integration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Data Utilization</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Data Dissemination or Delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Data Dictionary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Data Quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Business Intelligence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o <strong>Data is a valuable resource to any organization.</strong> Accurate and timely data is crucial to accurate and timely decisions. Data is the foundation of decision-making and must be carefully managed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o <strong>Data must be shared across business processes or functions.</strong> Quality data in an application which can be shared will eliminate process duplication and improve decision making.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o <strong>Data must be accessible for users to perform their functions.</strong></td>
</tr>
</tbody>
</table>
interfaces, and process to data elements mapping.

Access to data directs to improved efficiency and effectiveness in decision making and provision for health care services.

- There must be a data trustee responsible for data quality. The data trustee is responsible for ensuring the accuracy and timeliness of data.

- There must be common data standards. Data that will be used in the development of application systems must comply with the DOH National Health Data Dictionary.

- Data must be secured. Data must be protected from unauthorized use and disclosure.

### Technical Reference Model

- Technical framework that categorizes the technologies to support the delivery of service component
- Identifies and describes the technology (components, interfaces)
- Defines technologies and standards that can be used in building Information Systems

- Hardware & Network
- Network Infrastructure
- Database Infrastructure
- Telecommunication
- Operating System
- Storage
- Security
- Interoperability
- Technology Standards and Services

- A change is based on business need and must be made responsive. Changes must meet the requirements of the business and not changing the business in response to changes in information and communication technology.

- Software and hardware must be interoperable for data, applications and technology. Standards promote consistency and improve management of systems, resources and investments.

- Common technical standards lead to economies of scale. Technological diversity can be restricted to minimize maintenance and support costs and improve technical administration.

### Performance Reference Model

- Framework for measuring performance and outputs

- Inputs, Outputs, and Outcomes

- Use of Competency Maturity Model
<table>
<thead>
<tr>
<th>Inputs, outputs, and outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produced performance information.</td>
</tr>
<tr>
<td>Identify areas for improvements.</td>
</tr>
</tbody>
</table>
### XIII. BUSINESS REFERENCE MODEL

<table>
<thead>
<tr>
<th>SERVICES</th>
<th>Processes that interact more with the health sector group.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FRONTLINE SERVICES</strong></td>
<td>Policy, Planning &amp; Advocacy</td>
</tr>
<tr>
<td></td>
<td><strong>Medical Assistance ★ Drug Price Inquiry &amp; Availability ★ Health Services Inquiry ★ Health Facility Inquiry ★ Complaint Management ★ Blood Supply Inquiry</strong></td>
</tr>
<tr>
<td><strong>REGULATIONS</strong></td>
<td>Process for Licensing / Accreditation of Health Facilities &amp; Services</td>
</tr>
<tr>
<td></td>
<td>Policy, Planning &amp; Advocacy</td>
</tr>
<tr>
<td><strong>DISEASE SURVEILLANCE</strong></td>
<td>Processes for public and international health surveillance.</td>
</tr>
<tr>
<td></td>
<td>Policy, Planning &amp; Advocacy</td>
</tr>
<tr>
<td></td>
<td><strong>Event Detection (Like Health Facilities, Ports &amp; Airports) ★ Response Management ★ Situation Awareness - Risk Communication ★ Risk Assessment &amp; Evaluation ★ Mitigation</strong></td>
</tr>
<tr>
<td><strong>HEALTH SERVICE DELIVERY</strong></td>
<td>Processes that describe how services will be delivered in hospitals, rural health units, barangay health stations, clinics and other health care facilities.</td>
</tr>
<tr>
<td></td>
<td>Policy, Planning &amp; Advocacy</td>
</tr>
</tbody>
</table>
| | **Infrastructure & Equipment Upgrading ★ Health Facility Networking ★ Organizational & Financial Restructuring ★ Hospital Operations (Admission, OPD,**
<table>
<thead>
<tr>
<th>Department of Health – Enterprise Architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ER, Billing, Medical Records, Cashiering, Laboratory, Nursing Service, PhilHealth Claims Processing, Pharmacy, and others)</strong></td>
</tr>
<tr>
<td><strong>Clinic Operations</strong></td>
</tr>
<tr>
<td><strong>Patient Registry</strong></td>
</tr>
<tr>
<td><strong>Health Record Management (Disease – Symptom – Procedure Classification)</strong></td>
</tr>
<tr>
<td><strong>Registration of Death</strong></td>
</tr>
<tr>
<td><strong>Registration of Birth</strong></td>
</tr>
</tbody>
</table>

| **Processes for health emergency preparedness and response.** |
| **Policy, Planning & Advocacy | Standards Development | Health Emergency Preparedness | Health Emergency Response | Technical Assistance | Quality Assurance | Help Desk |
| **Operations Center – Alert System** |
| **Networking & Collaboration** |
| **Resource & Inventory Management** |
| **Document Management** |
| **Environmental Monitoring** |
| **Monitoring & Inspection** |
| **Case Investigation - Management** |

| **Processes to provide health services, educational, and informational resources.** |
| **Policy, Planning & Advocacy | Standards Development | Injury Prevention | Chronic Disease Prevention | Risk Reduction | Nutrition | Mental Health | Asthma Prevention | Physical Activity | Tobacco Use | Substance Abuse | Worksite Wellness | Environmental & Occupational Management | Local and Global Community Issues | Family Health | Health Promotion Campaigns & other DOH Health Programs | Technical Assistance | Quality Assurance | Help Desk |
| **Health Communication Development** |
| **Health Program Development** |
| **Education Development – Orientation – Presentation – Training** |

| **Processes to expand health packages and universal coverage.** |
| **Policy, Planning & Advocacy | Standards Development | Accreditation | Membership | Claims Processing | Collection & Payment | Technical Assistance | Quality Assurance | Help Desk |
| **Membership Enrollment - Unified Multi-Purpose ID** |
| **Provider Enrollment** |
| **Processing and Evaluation** |
| **Monitoring & Inspection** |
| **Issuance** |
| **Claims Processing** |
| **Verification** |
| **Collection** |
| **Remittance** |
| **Payment** |
| **Unclaimed Refunds** |

<p>| <strong>Processes to provide quality, safe and efficacious drugs at affordable cost, consistent with the needs of the health sector groups.</strong> |
| **Policy, Planning &amp; Advocacy | Standards Development | Generics Promotion | Pharmaceutical Programs-Projects-Services | Technical Assistance | Quality Assurance | Help Desk |
| <strong>Purchase and Sales Transactions</strong> |
| <strong>Inventory of Medicines</strong> |
| <strong>Medicine Information</strong> |
| <strong>Botika ng Bayan</strong> |
| <strong>Botika ng Barangay</strong> |
| <strong>P100</strong> |
| <strong>Compliance Packs</strong> |</p>
<table>
<thead>
<tr>
<th>Processes to provide adequate and continuous supply of human resources for health.</th>
<th>Policy, Planning &amp; Advocacy</th>
<th>Standards Development</th>
<th>Recruitment</th>
<th>Human Resource Management</th>
<th>Capability Building</th>
<th>Technical Assistance</th>
<th>Quality Assurance</th>
<th>Help Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency Standards ★ Performance Standards ★ Access to Scholarships ★ Residency Training ★ Salary Standardization ★ Benefit Packages ★ Migration</td>
<td>---</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes to ensure that healthcare facilities and pharmacies have adequate supply of drugs and other logistics to positively affect both patient outcome and the costs of care.</th>
<th>Policy, Planning &amp; Advocacy</th>
<th>Standards Development</th>
<th>Logistics Management</th>
<th>Technical Assistance</th>
<th>Quality Assurance</th>
<th>Help Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasting - Planning ★ Selection ★ Procurement ★ Delivery - Receiving ★ Warehousing ★ Distribution - Shipping ★ Utilization</td>
<td>---</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Processes to determine present environmental conditions, trends, understand phenomena, validate situation, and make assessment within the healthcare facilities.</th>
<th>Policy, Planning &amp; Advocacy</th>
<th>Standards Development</th>
<th>Air Quality Monitoring</th>
<th>Water Monitoring</th>
<th>Waste Management</th>
<th>Collaboration</th>
<th>Technical Assistance</th>
<th>Quality Assurance</th>
<th>Help Desk</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Processes to enable quick access to quality information to make prompt and effective decisions, and to provide quality services.</th>
<th>Policy, Planning &amp; Advocacy</th>
<th>Standards Development</th>
<th>Infrastructure Build-Up</th>
<th>KM Capture &amp; Sharing</th>
<th>Capability Building</th>
<th>Technical Assistance</th>
<th>Quality Assurance</th>
<th>Help Desk</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Processes to confirm findings and/or diagnosis.</th>
<th>Policy, Planning &amp; Advocacy</th>
<th>Standards Development</th>
<th>Laboratory Services</th>
<th>Technical Assistance</th>
<th>Quality Assurance</th>
<th>Help Desk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection &amp; Registration of Specimen ★ Specimen Analysis &amp; Evaluation – Result</td>
<td>---</td>
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</tbody>
</table>
XIV. APPLICATION REFERENCE MODEL

**DOH Web Portal | Email | Mobile Phone | Kiosk | Telephony | Telemedicine | Person to Person | ...**

**Identity Management | Directory Services | Forms and Services | Payment Services**

**PHPILINE HEALTH INFORMATION SYSTEM**

**DATA (XML) | SOAP | FTP | TCP/IP | STD | Others**

**WEB SERVICES**
A. E-HEALTH STRATEGIC GOALS

Vision: ICT supporting UHC to improve healthcare access, quality, efficiency, and patient safety & satisfaction, to reduce cost and enable policymakers, providers, individuals and communities to make the best possible health decisions.

MISSION: To effectively use ICT to improve health care delivery, administration and management, and in communicating health

GUIDING PRINCIPLES

Client-focus, Collaboration/Partnerships/User Involvement, Judicious & Efficient Use of Resources, Better Performance, Transparency, Public Accountability, Safeguarding privacy & Ensuring confidentiality, Keeping technology simple & relevant, Shared Learning

STRATEGIC GOALS

<table>
<thead>
<tr>
<th></th>
<th>Provide a rational and accountable eHealth agenda, and legal and normative framework and structures to implement eHealth (Enabling Structures &amp; Resources).</th>
<th>Establishment of legal, policy &amp; normative frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>o Definite Road Map</td>
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<tr>
<td></td>
<td></td>
<td>o Standardization (technical infrastructure, health informatics, statistics, interoperability, etc.)</td>
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<td></td>
<td></td>
<td>o Increased &amp; sustained financing including those from LGUs for local health facilities</td>
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<td></td>
<td></td>
<td>o HHR e-maturity/ capacity building</td>
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<tr>
<td></td>
<td></td>
<td>o Multi-agency/sectoral collaboration &amp; networks</td>
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<tr>
<td></td>
<td></td>
<td>o Support LGUs to finance, and sustain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o ICT infrastructure development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o R &amp; D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o M &amp; E</td>
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<tr>
<td>2</td>
<td>Increase efficiency of processes and systems in health care delivery and administration and create new processes and forms of doing things (Mission-Critical Health Application Systems)</td>
<td>Promoting more efficient health systems with the following priorities:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Social Health Insurance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Disease Surveillance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Essential Drugs Management &amp; Price Monitoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Health Emergency Preparedness &amp; Response</td>
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<tr>
<td></td>
<td></td>
<td>o Health facilities Management including Blood Supply</td>
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<tr>
<td></td>
<td></td>
<td>o Other Ancillary services</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Referrals</td>
</tr>
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<td></td>
<td></td>
<td>o Health Regulation of facilities, services, goods (drugs, food, cosmetics, hazardous household chemicals, etc.)</td>
</tr>
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<td></td>
<td></td>
<td>o Health records</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Health promotion &amp; learning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Financial, procurement, &amp; material management</td>
</tr>
</tbody>
</table>
| 3 | Establish a unified and coherent health & management Information systems (Philippine Health Information System) | - Harmonization/integration of data sources and information systems  
- Adoption of a data management standards and protocols  
- Enhancing health services statistics reporting and from both public especially from LGUs & private sector  
- Improve and scaling up implementation of ISs for health centers, hospitals, PHIC, HHR, and other critical information system under UHC  
- Expand data access and utilization for evidenced-based decisions and ISs sustainability  
- Information governance |
|---|---|---|
| 4 | Institutionalize knowledge management systems to promote knowledge exchange and utilization especially at sub-national levels (Knowledge Management for Health) | - Increase capacities for K production, use & application  
  - Health Research  
  - Knowledge translation  
- Improve access, exchange and sharing  
  - K portal & dashboard, Intranets, EIS, call center  
  - Data warehouse  
  - E-library  
  - National & international databases, publications  
  - Best practices  
  - CoPs or K networks  
  - GIS  
- Improve K tools, K hubs or learning & resource centers  
- Promote standard, repeatable processes & procedures |
| 5 | Capitalize on ICT to reach and provide better health services to GIDA, support MDGs attainment and dissemination of information to citizens and providers (Telemedicine/mhealth Services) | - Policy & Strategic framework  
- Implement systems to reach GIDA, and to support MDGs attainment (patient monitoring/tracking (WOMB-Watching Over Mothers and Babies, referrals, health providers networks, connecting health providers and patients, diagnostic services, etc) |
## B. E-HEALTH LAYERS

<table>
<thead>
<tr>
<th>#</th>
<th>Service Layer</th>
<th>Description</th>
<th>Application Users:</th>
</tr>
</thead>
</table>
| 1 | Service Layer | Provides administrative and technical services | o Patients - Filipino citizens, foreigners, resident aliens, visitors and tourists in need of or receiving medical care or treatment.  
  o Healthcare Professionals - Doctors, nurses, and allied health professionals.  
  o Employees - Work for the healthcare providers like hospitals, clinics, laboratories, and other organizations or offices that accommodate and treat patients.  
  o Legislators - Government, quasi-government and professional bodies for the provision of healthcare services on a national or regional basis. |
| 1 | Service Layer | Interactions: (See Item 6.2.2 for details) | o Doctor to Patient  
  o Doctor to Hospital  
  o Doctor to Government  
  o Doctor to Doctor  
  o Doctor to System  
  o Hospital to Patient  
  o Hospital to Hospital  
  o Hospital to Government  
  o Hospital to Doctor  
  o Hospital to System  
  o Patient to Patient  
  o System to Patient |

### 2 Channel Service Layer

<table>
<thead>
<tr>
<th>Channel Service Layer</th>
<th>Mechanisms to deliver services to the clients or patients to meet the requirements of e-Health</th>
<th>Mechanisms:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mechanisms:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Web Portal</td>
<td>DOH Portal / Internet</td>
</tr>
</tbody>
</table>
|                      |                                                                                                 | o For public use  
  o Integrate with the Unified Health Management Information System and business applications  
  o Public Information about the DOH’s services |
|                      |                                                                                                 | Unified Health Management Information System |
|                      |                                                                                                 | Brings together data from disparate data sources into a single view |
|                      |                                                                                                 | DOH Intranet |
|                      |                                                                                                 | o For DOH employees, healthcare professionals, policy makers and legislators  
  o Access to internal ICT services and applications |
|                      |                                                                                                 | Wireless |
|                      |                                                                                                 | Personal Digital Assistant |
|                      |                                                                                                 | o Access to the internet and information  
  o Respond to issues |
<table>
<thead>
<tr>
<th>DOH-IMS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobile Telephones</strong></td>
</tr>
<tr>
<td>Transmission of information about health services, health data reporting, disease control, and public information.</td>
</tr>
<tr>
<td><strong>Telephony</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>
| o Use of standard telephone device to transmit and receive sound.  
  o Centralized telephone call services  
  o Allows communication between the telephone and computer system.  
  o Facilitate calls via Dialled Number Identification System, Automatic Call Distribution, Predictive Dialing, Speech Enabled, Interactive Voice Response System |
<table>
<thead>
<tr>
<th><strong>Emails</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Means of writing, sending, receiving, and saving messages over electronic communication systems.</td>
</tr>
<tr>
<td><strong>Kiosks</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>Provide the required data/information to clients, e.g. Allow patients to confirm appointments, provide billing statement in hospitals, find directions to locations, disseminate information, and others, with the objective of minimizing waiting and congestion at the front desk, billing station, and others.</td>
</tr>
<tr>
<td><strong>Telemedicine</strong></td>
</tr>
<tr>
<td><strong>Video Telephony</strong></td>
</tr>
<tr>
<td>Facilitate the transfer of real time images to help communications between</td>
</tr>
<tr>
<td>Service Layer</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Tele-surgery</td>
</tr>
<tr>
<td>Remote Monitoring</td>
</tr>
<tr>
<td>Others</td>
</tr>
</tbody>
</table>

### 3 Shared Infrastructure Service Layer

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Client Identification**   | **o** Registration of Clients or Patients  
**o** Authentication / Verification of Clients or Patients |
| **Centralized Directory Service** | Provides information on resources like email addresses, hardware, and other relevant resources.  
Provides information of DOH services. |
| **PhilHealth Member Verification** | Verifies or confirms PhilHealth Membership |

### 4 Integration Service Layer

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Process Management**      | Includes use of tools to automate, manage, maximize and implement processes in all offices, divisions, systems and/or applications.  
Workflow Design and Management to improve efficiency and effectiveness |
| **Data Management**         | Common terminology and definition to describe data or information |
| **Information Reporting or Business Intelligence** | Reporting Levels  
Reporting structure for gathering or collecting data at the barangay, |
municipal, city, region to the national level.

- Operational Level – systems that run on daily basis to support functions
  - Financial Management
  - Clinical Administration
  - Enterprise Resource Planning and Management

- Data Capture Level
  - Hospital Admission
  - Hospital OPD
  - Hospital ER

- Data Analysis Level
  - Use of Data
    - Statistics/Quantitative Analysis
    - Explanations

- Presentation Level
  - Generation and presentation of reports

**C. APPLICATION LEVEL USERS’ INTERACTIONS**

<table>
<thead>
<tr>
<th>#</th>
<th>Users</th>
<th>Patient</th>
<th>Hospital</th>
<th>Government</th>
<th>Doctor</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Doctor</td>
<td>Patient Care or Treatment</td>
<td>Administrative – Work Assignment</td>
<td>Registration of healthcare professionals</td>
<td>Referral of Patients</td>
<td>Access to patient’s data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clinical – Patient Care and Treatment</td>
<td>Setting and observance of professional standards</td>
<td>Case Reviews and Triage</td>
<td>Maintenance of patient’s data</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Information Sharing</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Delegation of Care</td>
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<td></td>
<td>Organization and management of clinical groups and expert teams</td>
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<td>2</td>
<td>Hospital</td>
<td>Administrative Transactions: Appointments, OPD Attendance, Admission,</td>
<td>Patient Administration</td>
<td>Funding or Resource Allocation</td>
<td>-</td>
<td>Patient Attendance Team Scheduling</td>
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<td></td>
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<td></td>
<td>Clinical Care Facility</td>
<td>Audit</td>
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<tr>
<th></th>
<th>Discharges</th>
<th>Management Ancillary Services (Laboratory, Imaging, others)</th>
<th>Performance Improvement</th>
<th>Performance Measurement and Monitoring of standards care</th>
<th>Facility Scheduling</th>
<th>Maintenance of Waiting Lists</th>
<th>Recording of examination / test results</th>
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<tr>
<td>3</td>
<td>Government</td>
<td>Registration for program services Community based activities</td>
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<td>-</td>
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<td>-</td>
<td>Setup and management of administrative facilities Standard procedures and coding Setup of budgets and targets</td>
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<td>4</td>
<td>Patient</td>
<td>Help groups, i.e. charitable groups Community based activities Insurers</td>
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<td>5</td>
<td>System</td>
<td>Establishment and maintenance of patient's data</td>
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# D. APPLICATION SYSTEMS

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<th>MAINTENANCE STRATEGY</th>
<th>COMPUTING SCHEME</th>
<th>MODE</th>
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</table>
| 1 | Integrated DOH Licensing System | Regulation | Objectives:  
  a. Reduce transaction time  
  b. Improve management reporting and control mechanisms  
  c. Provide quality information  
  d. Reduce graft and corruption  
  e. Strengthen quality assurance program  
  f. Strengthen implementation of standards | For Software Development | Outsourcing | In-House | Online | Real Time |

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<td></td>
<td></td>
<td></td>
<td>Integrates the following:</td>
<td>BHFS</td>
<td>BHFS, FDA,</td>
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<td>Hospitals</td>
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<td></td>
<td></td>
<td></td>
<td>a. “One-Stop-Shop” Hospital Licensing - Harmonization and streamlining of systems and processes for licensing and accreditation to make health regulation more rational and client-responsive.</td>
<td></td>
<td>NCHFD, CHDs</td>
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<td></td>
<td>b. Accreditation of OFW Clinics - System of accrediting OFW Clinics.</td>
<td>BHFS</td>
<td>BHFS, NCHFD,</td>
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<td></td>
<td>a. Dialysis Clinic Licensing - System for application, inspection and license issuance for Dialysis Clinics.</td>
<td>BHFS</td>
<td>BHFS, NCHFD,</td>
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<td>b. X-ray Licensing - System of licensing of X-ray facilities like medical, dental, educational, industrial and</td>
<td>BHFS</td>
<td>BHFS, FDA,</td>
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<td>veterinary facilities.</td>
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<td>c. Devices Licensing – System of licensing health related devices.</td>
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<td>FDA</td>
<td>FDA, BHFS, NCHFD, CHDs</td>
<td>Health Facilities</td>
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<td>2</td>
<td>Botika ng Barangay Registry System</td>
<td>Regulation</td>
<td>Objective: Provide access to affordable and quality drugs and medicines. Database registry of all Botika ng Barangays nationwide to facilitate program monitoring.</td>
<td>NCPAM</td>
<td>NCPAM, PITACH, FDA, CHDs</td>
<td>General Public, Botika ng Barangays, LGUs</td>
<td>For Software Developme nt</td>
<td>In-House</td>
<td>In-House</td>
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<tr>
<td>3</td>
<td>Integrated Food and Drug Administration Information System</td>
<td>Regulation</td>
<td>Objectives:</td>
<td>FDA</td>
<td>NCPAM, CHDs</td>
<td>All health products establishment and health products, LGUs, General Public, Int’l Communities, Legislative Bodies</td>
<td>Ongoing Enhancement</td>
<td>Outsourcing</td>
<td>In-House</td>
<td>Online</td>
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<td></td>
<td>a. Reduce transaction time</td>
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<td></td>
<td>b. Improve management and financial reporting and control mechanisms</td>
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<td>c. Provide quality information</td>
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<td>System of automating the regulatory functions of the Food and Drugs Administration on establishments and outlets dealing with the importation, exportation, distribution, advertisement, manufacture, re-packing of foods, drugs, devices, cosmetics, and household hazardous substances.</td>
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<td>Includes system of regulating medical, health related and radiation emitting devices and radiation facilities.</td>
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| 4  | Integrated Drug Test Operations and Management Information System | Regulation | Integrated system of the following:  
d. Accreditation of Drug Testing Laboratories  
e. Accreditation of Rehabilitation Centers  
f. Inspection of Drug Test Kits by the Regional Offices  
g. Screening Drug Test Operations  
h. Confirmatory Drug Test Operations | BHFS         | BHFS, OSC, CHDs               | Drug Test Laboratories, Rehab Centers, Legislative Bodies, LGUs, NGOs, Service/Product Providers, General Public | Operational     | Outsourcing    | Outsourcing                  | Online with Local Database | Real Time |
| 5  | International Health Surveillance Information System | Regulation | Objectives:  
- Improve surveillance system  
- Improve management and financial reporting and control mechanisms  
Monitoring of domestic and emerging/re-emerging diseases that maybe brought in from ports of entry and exit in the Philippines of | BOQ          | BOQ, NEC, NCDPC, HEMS, NCHFD, CHDs                    | General Public, Ports, WHO, International communities, Legislative Bodies, For Software Development | Outsourcing    | Outsourcing    | Online                | Real Time        |           |
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<td>incoming and outgoing vessels and aircraft, surveillance system over their sanitary conditions, as well as over cargoes, passenger crews, and all personal effects.</td>
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<td>6</td>
<td>Stock Inventory System</td>
<td>Governance</td>
<td>Objective: - Monitor stock on hand A system where purchases, sales, and stocks of items can be monitored. If items are medicines, data on purchases, sales and stock on hand can be automatically retrieved and send to the DOH for reporting in the Electronic Drug Price Monitoring System.</td>
<td>NCPAM</td>
<td>NCPAM, PD, MMD, CHDs</td>
<td>Pharmaceutical Establishments, Health Facilities, LGUs, General Public</td>
<td>Operational</td>
<td>In-House</td>
<td>In-House</td>
<td>Stand-Alone or Client Server</td>
<td>Real Time or Batch</td>
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<td>7</td>
<td>Electronic Drug Price Monitoring System</td>
<td>Governance</td>
<td>Objective: Support Republic Act 9502 for the Department of Health to establish an electronic drug price monitoring system. Allows pharmaceutical establishments to report data on medicine’s purchase price, selling price and stock on hand.</td>
<td>NCPAM</td>
<td>NCPAM, FDA, PITAHC, PD, CHDs</td>
<td>Pharmaceutical Establishments, Hospital Pharmacies, General Public, LGUs, Legislative Bodies, Service/Product Providers</td>
<td>Operational</td>
<td>Outsourcing</td>
<td>In-House</td>
<td>Online</td>
<td>Real Time or Batch</td>
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<td>8</td>
<td>Clinic System</td>
<td>Service Delivery</td>
<td>Objective: a. Improve health service delivery b. Improve recording and reporting system System of reporting data which includes the following: a. Disease Surveillance Data – Data on monitoring disease occurrences to</td>
<td>NEC</td>
<td>NEC, NCHFD, NCDPC, NEC, HEMS, CHDs</td>
<td>Health Facilities with Clinics, LGUs, NGOs, Service/Product Providers, General Public</td>
<td>Ongoing Development and Pilot Testing</td>
<td>In-House</td>
<td>In-House</td>
<td>Stand-alone</td>
<td>Batch or Real Time</td>
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<td>provide timely and accurate information and early warning of disease outbreaks. These are the consolidated data from the National Epidemiology Center, Bureau of Quarantine, and National Center for Disease Prevention and Control.</td>
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<td>b. Field Health Services Data - Health accomplishments, delivery of health services, and morbidity data from rural health units and barangay health stations. Public health data are: Maternal and Child Health, Expanded Program on Immunization, Control of Diarrheal Diseases, Nutrition,</td>
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<td>Family Planning, Tuberculosis, Malaria, Schistosomiasis, Filariasis, Leprosy, Dental Health, and Environmental Health.</td>
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<td>d.</td>
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<td>Data on injury cases whether firecracker or non-firecracker related.</td>
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<td>e.</td>
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<td>Data on chronic non-communicable diseases like cancer, stroke, diabetes, copd, blindness, and other related diseases.</td>
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<td>9</td>
<td>Health Emergency Preparedness and Response Information System</td>
<td>Service Delivery</td>
<td>Objectives: Coordinate efforts and sharing of resources among the DOH hospitals and offices, other government agencies, LGUs, private sector and non-government organization.</td>
<td>HEMS</td>
<td>NCHFD, NCDPC, NEC, PD, MMD</td>
<td>Health Facilities, LGUs, General Public, Service/ Product Providers, International Communi-</td>
<td>Ongoing Developme nt</td>
<td>Outsourcin g</td>
<td>Outsourcin g</td>
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<td>Real Time</td>
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<td>Service Delivery</td>
<td>The system supports the emergency services provided by a national network from the community to national level through coordination of efforts and sharing of resources among the DOH hospitals and offices, other government agencies, LGUs, private sector and non-government organization.</td>
<td>NCHFD</td>
<td>NCHFD, NCDPC, NEC, CHDs</td>
<td>Hospitals, LGUs, General Public, International Communities</td>
<td>Outsourcing</td>
<td>In-House</td>
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<td>Client Server</td>
<td>Real Time or Batch</td>
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<td>10</td>
<td>Hospital Operations and Management Information System</td>
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<td>Objectives: a. Reduce transaction time b. Improve service delivery and response time to the public c. Maximize limited resources d. Improve management reporting and control mechanisms e. Provide quality</td>
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<td>f. Strengthen quality assurance program and surveillance systems.</td>
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<td>g. Strengthen implementation of standards</td>
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<td>The system establishes or reinforces standard operating procedures to systematically collect, process, generate and share data/information to facilitate and improve patient delivery services. It includes the following modules:</td>
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<td>a. Module 1: Admitting, Emergency Room, Outpatient, Billing, Cashier, PHIC, Medical Records, Medical Social Service</td>
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<td>Operational</td>
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<td>Client Server</td>
<td>Real Time or Batch</td>
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<td>b. Module 2: Wards,</td>
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<td>Operational</td>
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<td>Client</td>
<td>Real</td>
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<td></td>
<td>Laboratory, Pharmacy, Radiology, Revenue Centers, Dietary and Other Ancillaries</td>
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<td>Server</td>
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<td>d.</td>
<td>Data Uploading or Reporting to the DOH Central Office</td>
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<td>Ongoing Enhancement</td>
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<td>Online</td>
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<td>e.</td>
<td>Data Harmonization: Inclusion of the following data: - Disease Surveillance Data - Field Health Services Data - Injury Data - Chronic Non-Communicable Data</td>
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<td>Ongoing Enhancement</td>
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<td>Client Server</td>
<td>Real Time or Batch</td>
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<td></td>
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<td>Service Delivery</td>
<td>Objective: Provide immediate access on the availability of bloods. The system ensures safe, adequate, accessible, and rationally used blood supply.</td>
<td>NCHFD</td>
<td>NCHFD, NVBS, PBC, CHDs</td>
<td>Hospitals, LGUs, General Public</td>
<td>Ongoing Development</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online with Local Database</td>
<td>Real Time</td>
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**Integrated Blood Bank Information System**
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</table>
| 12 | Electronic Field Health Services Information System | Good Governance | Objectives:  
   a. Improve management reporting and control mechanisms.  
   b. Provide quality information.  
   Database registry and reporting of injury cases for epidemiologic studies, policy formulation and development of injury prevention programs. | NEC | NEC, NCDPC, NCHFD, BLHD, CHDS | Health Facilities with Clinics, General Public, LGUs | Operational | Outsourcing | In-House | Online | Real Time or Batch |
| 13 | Online National Electronic Injury Surveillance System | Good Governance | Objective:  
   Monitor cases of injury-related diseases to provide timely and accurate information.  
   Database registry and reporting of injury cases for epidemiologic studies, policy formulation and development of injury prevention programs. | NCDPC | NCDPC, NEC, NCHFD, CHDs | Health Facilities, General Public, LGUs | Operational | Outsourcing | In-House | Online | Real Time or Batch |
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<td>14</td>
<td>Unified Health Management Information System</td>
<td>Good Governance</td>
<td>Objective: Provide a central venue to access all information systems and reports to facilitate access. Convergence of all DOH information systems and data to facilitate execution of systems, processing of data, report generation, and presentation of reports.</td>
<td>IMS</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>Ongoing Enhancement</td>
<td>In-House</td>
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<td>15</td>
<td>Web-enabled Public Assistance Information System</td>
<td>Good Governance</td>
<td>Objectives: a. Facilitate grant of assistance to indigents b. Improve monitoring of fund utilisations The system monitors referral outcome and public assistance fund utilization.</td>
<td>NCHAP</td>
<td>NCHAP, OSEC, CHDs</td>
<td>Health Facilities, General Public, LGUs</td>
<td>Ongoing Enhancement</td>
<td>Outsourcing</td>
<td>In-House</td>
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<td>16</td>
<td>Health Care Investment and Good Governance</td>
<td>Good Governance</td>
<td>Objective:</td>
<td>BIHC</td>
<td>BIHC, HPDPB,</td>
<td>Health Investors, For Scoping and Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time</td>
<td>Online</td>
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<td></td>
<td>Performance Monitoring System</td>
<td>Monitor investments and performances. The system to manage and monitor revenue collection (process by which the health system receives money from households and organizations including donors), purchasing (process by which pooled funds are paid) to improve responsiveness and financial fairness for providing package of health services to the people, and monitoring utilization of investments.</td>
<td>OSEC, CHDs</td>
<td>Donors, and Development Partners, LGUs</td>
<td>Developme nt</td>
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<td>17</td>
<td>Health Human Stock Inventory System</td>
<td>Good Governance Objective: Provide access to data on health related positions in different health and non-health facilities across the country</td>
<td>HHRDB</td>
<td>DOH Offices</td>
<td>All Offices/Agencies</td>
<td>Operational</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
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<td>18</td>
<td>Health Policy Database System</td>
<td>Good Governance</td>
<td>Objective: Provide access to accessing health policies, laws, health programs, services, and standards. Database system of maintaining and accessing health policies, laws, health programs, services, and standards.</td>
<td>HPDPB</td>
<td>DOH Offices</td>
<td>General Public, Legislative Bodies, LGUs, NGOs</td>
<td>For Development</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
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<tr>
<td>19</td>
<td>Personnel Information System</td>
<td>Good Governance</td>
<td>Objective: Maintain and provide access to data/information of DOH employees. System of maintaining and accessing data or personnel information.</td>
<td>HHRDB</td>
<td>DOH Offices</td>
<td>PRC, Academe, Professionals, Associations, LGUs</td>
<td>Operational</td>
<td>Outsourcing</td>
<td>In-House</td>
<td>Client-Server</td>
<td>Real Time or Batch</td>
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<td>Integrated Project Tracking Information System</td>
<td>Good Governance</td>
<td>Objective:</td>
<td>BIHC</td>
<td>DOH Offices</td>
<td>Development Partners</td>
<td>For Implementation</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
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<td>a. Provide monitoring of projects.</td>
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<td></td>
<td>b. Monitor performance of staff/offices.</td>
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<td>System of maintaining, monitoring or tracking the status of local and foreign assisted projects.</td>
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<td>International Health Coordination Information System</td>
<td>Good Governance</td>
<td>Objectives:</td>
<td>BIHC</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>For Development</td>
<td>Outsourcing</td>
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<td>a. Monitor goods, articles and other items donated to all DOH offices.</td>
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<td>b. Monitor visits coming from various organizations and institutions most notably from WHO and other partner agencies with whom the Philippines has bilateral relations and</td>
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<td>commitments. c. Monitor international fellowships granted to employees. d. Provide data on physicians who have undergone certain specialization training. System of monitoring goods, articles and other items donated to all DOH offices; monitoring visits coming from various organizations and institutions most notably from WHO and other partner agencies with whom the Philippines has bilateral relations and commitment; record of international fellowships granted to employees; and physicians' data who have undergone certain specialization training.</td>
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<td>22</td>
<td>Local Health Database System</td>
<td>Good Governance</td>
<td>Objective: Provide access to exemplary practices, and documentation relevant to local health implementation. Database of maintaining and accessing exemplary practices, and documentation relevant to local health implementation.</td>
<td>BLHD</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>For Enhancement</td>
<td>Outsourc ing</td>
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<td>23</td>
<td>Electronic Job Posting System</td>
<td>Good Governance</td>
<td>Objective: Provide access to vacant positions in the health sector. System of posting job vacancies related to health across the country, and application to DOH vacant positions.</td>
<td>HHRDB</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>Operational</td>
<td>Outsourc ing</td>
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<td>24</td>
<td>Pinoy MD System</td>
<td>Good Governance</td>
<td>Objective: Provide access to pool of medical experts.</td>
<td>HHRDB</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>For Review</td>
<td>In-House</td>
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<td>The system aims register PINOY MD Medical Scholarship Program.</td>
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<td>25</td>
<td>Political Profiling System</td>
<td>Good Governance</td>
<td>Objective: Provide access to government politicians and the health services or programs given.</td>
<td>HPDPB</td>
<td>DOH Offices</td>
<td>General Public, LGUs</td>
<td>For Conversion</td>
<td>In-House</td>
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<td>Database registry of all government politicians and the health services or programs given.</td>
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<td>26</td>
<td>Research Database System</td>
<td>Good Governance</td>
<td>Objective: Provide access to research related documents or materials.</td>
<td>HPDPB</td>
<td>All DOH Offices</td>
<td>General Public, LGUs, International Communities</td>
<td>For Development</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
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<td>and accessing health systems research, operation research, clinical and other researches.</td>
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<td>Legislative Bodies</td>
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<td>27</td>
<td>Expenditure Tracking system</td>
<td>Good Governance</td>
<td>Objective: Improve monitoring or tracking of expenditures.</td>
<td>HPDPB</td>
<td>All DOH Offices</td>
<td>-</td>
<td>Ongoing</td>
<td>Outsourcing</td>
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<td>System of maintaining, monitoring, and tracking of expenditures.</td>
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<td>Enhancement</td>
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<td>28</td>
<td>Document Tracking System</td>
<td>Good Governance</td>
<td>Objective: Improve monitoring and follow up of documents.</td>
<td>IMS</td>
<td>DOH Offices</td>
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<td>Operational</td>
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<td>System of monitoring and tracking internal and external documents originating from one office/entity to another.</td>
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<td>29</td>
<td>Integrated Logistics and Financial Management Information System</td>
<td>Good Governance</td>
<td>Objective: Facilitate monitoring of logistic and financial related transactions.</td>
<td>FS, PD, MMD</td>
<td>DOH Offices</td>
<td>-</td>
<td>For Software Developme nt</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Integrated system of:</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>a. Procurement Operations and Management Information System – Automating processes covered by Republic Act 9184, i.e. from planning to issuance of Notice to Proceed; Includes issuance of CAF as part of the Financial System.</td>
<td>PS</td>
<td>All DOH Offices</td>
<td>For Software Development</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>b. Warehousing and Distribution System - Receipt of items delivered or procured and distribution to end-users; Includes issuance of documents for payments; Can automatically extract stock on hand for data uploading to the DOH Central Office.</td>
<td>MMD</td>
<td>All DOH Office</td>
<td>For Software Development</td>
<td>Outsourcing</td>
<td>Outsourcing</td>
<td>Online</td>
<td>Real Time or Batch</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>c. Financial System</td>
<td>FS</td>
<td>All DOH</td>
<td>Part of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#</td>
<td>APPLICATION SYSTEMS</td>
<td>TYPE</td>
<td>OBJECTIVES AND DESCRIPTION</td>
<td>SYSTEM OWNER</td>
<td>EXTERNAL USER</td>
<td>STATUS</td>
<td>DEV. STRATEGY</td>
<td>MAINTENANCE STRATEGY</td>
<td>COMPUTING SCHEME</td>
<td>MODE</td>
<td></td>
</tr>
<tr>
<td>----</td>
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<td>---------------------------------------------------------------------------------------------</td>
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<td>--------------</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>National Stock Inventory System</td>
<td>Good Governance</td>
<td>Objective: Provide timely information on stocks on hand of medicines. System of reporting current stock level or inventory to the DOH Central Office.</td>
<td>MMD, NCDPC</td>
<td>DOH Offices</td>
<td>For Implementation</td>
<td>In-House</td>
<td></td>
<td>Online Real Time or Batch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Payroll System</td>
<td>Asset Management</td>
<td>-</td>
<td>DOH Offices</td>
<td>-</td>
<td>Operational</td>
<td>In-House</td>
<td>In-House</td>
<td>Real Time or Batch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
XV. DATA REFERENCE MODEL

The IMS has established and maintained a data architecture to manage the design, availability, integrity, and efficient use of data and information systems. The data architecture defines how data is stored, managed, and used. The architecture has served useful to the DOH especially when information or application systems are developed by external contractors or system developers.

1. Type of data collection or reporting system depends on various conditions or circumstances that exist in the health facilities, namely:

<table>
<thead>
<tr>
<th>Conditions or Circumstances in the Health Facilities</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>#</strong></td>
<td><strong>Computers</strong></td>
</tr>
<tr>
<td>1</td>
<td>With computers</td>
</tr>
</tbody>
</table>

1.1 Offices which require data for submission to the DOH must develop a Data Uploading System to enable health facilities to electronically submit the data.

1.2 Standard data sets must be defined and issued to the health facilities for them to prepare or develop a program to retrieve the required data from their system.
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>The standard data sets must be included in the DOH Health Data Dictionary. DOH offices concerned must coordinate with the DOH HDSC for data standards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>With computers</td>
<td>With existing IS</td>
<td>Without internet connection</td>
</tr>
<tr>
<td>3</td>
<td>With computers</td>
<td>Without existing IS</td>
<td>With internet connection</td>
</tr>
<tr>
<td>4</td>
<td>With computers</td>
<td>Without existing IS</td>
<td>Without internet connection</td>
</tr>
<tr>
<td>5</td>
<td>Without computers</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

2. DOH offices can opt to store the data submitted by the health facilities in their area or in IMS. Corresponding duties and responsibilities on database management and administration shall be the responsibility of the office where the data is physically stored.

3. The data owner shall be responsible for validating the accuracy, reliability, and/or authenticity of the data. Mechanisms or procedures on how to do data validation shall also be the responsibility of the data owner.

4. The data owner shall be responsible for processing and analyzing the data. Official results or reports shall emanate from the data owner.

5. Official reports shall be posted in the DOH Portal upon official endorsement to IMS or uploaded to the DOH Portal by their designated and duly authorized personnel.

6. Once posted in the DOH Portal, official reports can be accessed by the general public.
A. DATA OWNERSHIP

a. DOH offices have mandates, thrusts, objectives and/or goals to achieve. In the accomplishment of their assigned tasks, they develop information or application systems to support their functions. As such, they become data owners of the data that they collect and process using these application systems.

b. Data owners shall have accountability and authority for the data, and shall be responsible for its accuracy, integrity and timeliness.

B. DATA COLLECTION AND REPORTING

a. Offices shall collect or require submission of data in execution of their defined thrusts, mandates, objectives, goals or requirements; and/or support or compliance to laws, regulations, orders, and/or issuances of the GoP or the DOH itself.

b. In collecting or requiring submission of data, offices must specify the data sets to be collected, mandatory or voluntary in form, frequency of data submission, and type of data collection or submission.

C. DATA QUALITY MANAGEMENT

Offices shall ensure the quality of data being collected and processed by the DOH. These data are used for analysis and generating results or conclusions. Regular validation or checking must be done to check the quality of data being reported, processed and analyzed.

D. DATA PROCESSING, ANALYSIS, PRESENTATION AND DISSEMINATION

a. Regular updates of the data being collected, processed, and analyzed by the different offices can be officially endorsed to IMS for web posting, or to its duly designated and authorized personnel.

b. Data shall be validated by concerned offices prior to official posting.

E. DATABASE MANAGEMENT AND ADMINISTRATION

A database is an integrated collection of data. This data can be maintained as a collection of operating system files or stored in a Database Management System, the program which enables the creation and maintenance of a database. With DBMS, there is data independence and efficient access, reduced application development time, data integrity and security, and data administration.

Data Administration implements, monitors, and coordinates the standards necessary to administer, store, and access the data. The responsibility of managing and/or administering the database shall be vested in the office where the database is physically located.
F. DATA AND DATABASE OWNERSHIP

a. For data resulting from the products of information or application systems being developed and/or implemented, the concerned office shall be the data owner.

b. Data within the production of database and under the custody of IMS shall have a corresponding owner.

c. A central DOH Database Administrators shall be responsible for creating, maintaining, upgrading, and restoring all production and non-production databases. This function is currently lodged in the Database and Network Management Division of IMS.

G. DATA BACKUP

IMS and offices where data is physically located shall comply with the following guidelines:

a. Backup of data shall be done on a daily basis.

b. The retention period of data stored in a production environment shall depend on the requirements of the application system being developed or implemented.

c. Information to be included when issuing retention period of data are: how the data will be secured, and who shall be responsible for doing the backups and that the backups are available.

d. The lifetime of backups being used, i.e. average lifetime, must also be considered.

H. DATA SECURITY

Sensitive data may not be store on a computer that is connected to the internet, and preferably not connected to any network. The degree of sensitivity must be qualified accordingly.

I. DATA SECURITY AND CONFIDENTIALITY MANAGEMENT

Privacy restrictions are apply if the data collected includes information about people, such as personally-identifying information like name, address, and others; information about people’s locations or movements; or health and medical information.

1. Personal Data

a. Personal data shall be collected for a lawful purpose directly related to the functions or activities of the Government of the Philippines.

b. Personal data shall be used for the lawful purpose for which it was collected.

c. In cases that there is a need to collect personal data and no existing laws or orders support its collection, consent from the person to whom the data relates must be seek.
d. If the data is not anonymous, it shall only be used or disclosed for purposes for which the use or disclosure of personal data is permitted by existing policies and legislations.

2. Data Access Rights

Data Access Rights enables compliance to privacy and confidentiality policies. This also helps in maintaining the authenticity of data by limiting access to the data.

a. Data access rights and levels shall be duly approved by the Head of Office. As such, only authorized users shall be given rights to access data.

b. Data access rights and/or levels may change during implementation subject to the approval of the Head of Office.

c. Data access rights can be defined on a per-user or per-data basis.

d. Data access agreements between the Head of Office and the concerned staff may include the data to be accessed, and/or limitation on the purpose for which the data may be used.

3. Offices with confidential data shall require all of its staff to sign a Confidentiality Agreement. The agreement must identify the owner of rights in relation to the confidential data, data that is to be treated as confidential, obligations on the staff to whom the information is disclosed to maintain the confidentiality of data/information, scope of the permitted use of the data, and sanction for the consequence of a failure to comply with the confidentiality obligations.

J. DATA INTEGRATION

The DOH has started works on data standardization and system integration. The primary objective is to bring together data from different information systems, to share and disseminate them, and to ensure that health information is used rationally, effectively, and efficiently to improve health actions or decision making process.

a. In hospital information systems and registry systems, there is a need to establish a unique patient identifier to facilitate integration of data. The IMS has defined its strategy in addressing the issue on integrating data at the patient level. A centralized issuance and verification of patient identifier shall be established to generate integrated reports and improve the quality of health data being reported by the DOH.
Facilitate integration of data. Example:

- Cancer Registry
- Renal Disease Registry
- Diabetes Registry
- Asthma and COPD Registry
- Stroke Registry
- Other Existing Registries

Risk Factors:
- 01 Tobacco Use
- 02 Excessive Drinking

b. Development of Information or Application System to effect integration of data:

i. Offices shall build on existing health information or application systems to integrate content, data and/or information functions.

ii. Policies and regulations for data gathering and submission shall be periodically reviewed and enhanced.

iii. Offices shall comply to the government policy on Information and Communication Technology and other GoP relevant issuances.

v. Offices shall use the DOH HDD to ensure integration and sharing of data.

K. DOH NATIONAL HEALTH DATA DICTIONARY

The DOH Health Data Dictionary established by the IMS sets the uniform standards for collection of data to allow ease of processing and analysis. The DOH HDD includes core set of uniform definitions relating to health services, and promotes uniformity, availability, reliability, consistency, validity and completeness in data. The Interim Health Data Standards Committee was created to assess data definitions proposed for inclusion in the DOH NHDD and approve any revisions or additions to each successive version of the dictionary.

1. Standard data references that will affect other information systems shall be defined, encoded, and maintained by IMS. Examples of these are: geographic coding of regions, provinces, cities/municipalities, barangays, sex, nationality, religion, references used in hospital information system (mode of admission, procedures/examinations), drugs and medicines, supplies, and other references which will serve as standards or common in all information or application systems.

2. Data references that are specific to the implementing office or applicable only to the information or application systems being developed and will not affect other existing systems shall be encoded and maintained by the offices concerned.

3. Offices may request for inclusion of additional reference data to the IMS.

4. Data element definitions to be included in the DOH HDD shall require endorsement from the IHDSC.

L. DATA WAREHOUSING

The DOH Data Warehousing Model:

1. DOH offices can setup their own respective databases based on the information or application systems that they have developed. As such, for DOH data integration and sharing, these databases must be connected via a network, internet connection, or other interconnectivity protocols as shall be agreed upon by the offices concerned and the Database and Network Management Division of IMS. The management and administration of the databases is under the Database Management and Administration section.
2. Attached DOH agencies as well as other government agencies may be connected to the DOH network infrastructure subject to the review and approval of the DNMD of IMS. For the best interest of securing the DOH data and infrastructure, other mechanisms for data sharing may be agreed upon (e.g. generation of text file or xml file).

3. Health facilities in the regions, provinces, cities/municipalities, and even barangays can setup their own local database or a network of databases within their respective areas. The data sets and definitions from the DOH HDD will establish a common and uniform definitions that will standardize the data coming from different sources.
DOH-IMS

Department of Health – Enterprise Architecture

DOH

Barangay Health Station
Rural Health Unit
District Hospitals
City Hospitals
Provincial Hospitals
Regional Hospital and Medical Center Levels

Standard Data Transfer
- Indicators
- Aggregate Values

DOH Data Warehouse

Information Access

DB

Barangay
Municipal Government
City Government
Provincial Government
National Government

Health Facilities
## M. MINIMUM DATA SETS

### HEALTH

#### Health Status

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>Life expectancy</td>
</tr>
<tr>
<td></td>
<td>Proportion surviving from birth by sex</td>
</tr>
<tr>
<td></td>
<td>Proportion population 65 and over</td>
</tr>
<tr>
<td>Crude Death Rate</td>
<td></td>
</tr>
<tr>
<td>Infant Mortality Rate</td>
<td></td>
</tr>
<tr>
<td>Child Mortality Rate</td>
<td></td>
</tr>
<tr>
<td>Under-Five Mortality Rate</td>
<td></td>
</tr>
<tr>
<td>Maternal Mortality Ratio</td>
<td></td>
</tr>
<tr>
<td>Causes of Mortality</td>
<td>Death rates for selected causes of deaths</td>
</tr>
</tbody>
</table>

#### Morbidity

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morbidity</td>
<td>Incidence of Specific Notifiable Diseases</td>
</tr>
<tr>
<td></td>
<td>No. of bird or avian flu cases</td>
</tr>
<tr>
<td>Causes of Morbidity</td>
<td></td>
</tr>
<tr>
<td>Fully Immunized Children</td>
<td>Proportion of 1 year-old children immunized against measles</td>
</tr>
<tr>
<td></td>
<td>HIV prevalence among 15-24 year old pregnant women</td>
</tr>
<tr>
<td></td>
<td>Number of children orphaned by HIV/AIDS</td>
</tr>
<tr>
<td></td>
<td>Prevalence and death rates associated with malaria</td>
</tr>
<tr>
<td></td>
<td>Proportion of population in malaria risk areas using effective malaria prevention &amp; treatment measures</td>
</tr>
<tr>
<td></td>
<td>Prevalence &amp; death rates associated with tuberculosis</td>
</tr>
<tr>
<td></td>
<td>Proportion of tuberculosis cases detected &amp; cured under directly observed treatment short course (DOTS)</td>
</tr>
<tr>
<td></td>
<td>Condom use rate of the contraceptive prevalence rate</td>
</tr>
<tr>
<td></td>
<td>Prevalence of Specific Drug and Substance Abuse</td>
</tr>
<tr>
<td></td>
<td>Proportion of population with access to affordable essential drugs on sustainable basis</td>
</tr>
<tr>
<td></td>
<td>Reported Cases of Drug Dependency</td>
</tr>
<tr>
<td></td>
<td>DOH-retained and Local Government Unit- hospitals selling low-priced drugs</td>
</tr>
<tr>
<td></td>
<td>Rate of increase / decrease in the number of mental health facilities upgraded</td>
</tr>
</tbody>
</table>

#### Environmental Sustainability

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Sustainability</td>
<td>Proportion of households with Sanitary Toilet Facilities</td>
</tr>
<tr>
<td></td>
<td>Proportion of population with sustainable access to improved water source</td>
</tr>
<tr>
<td></td>
<td>Proportion of urban population with access to improved sanitation</td>
</tr>
</tbody>
</table>

### Disability

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability</td>
<td>Prevalence of Disability</td>
</tr>
<tr>
<td></td>
<td>Causes of Disability</td>
</tr>
</tbody>
</table>

### Health Resources

<table>
<thead>
<tr>
<th>Metric</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>No. of government hospitals provided with training to improve their service capabilities</td>
</tr>
<tr>
<td></td>
<td>No. of licensed hospitals</td>
</tr>
</tbody>
</table>
## Department of Health – Enterprise Architecture

### Ratio to Population of Health Facilities
- Proportion of births attended by skilled health personnel
- No. of government doctors, nurses, dentists & midwives
- Physicians per 1,000 population
- Ratio to Population of Health Manpower

### Financing
- Total Health Expenditure
- Share of Health Expenditure to GNP and GDP
- Health Expenditure by Source of Funds
- Health Expenditure by Use of Funds
- Gross Value Added on Health
- Per Capita Health Expenditure

### Health Services (Provision and Utilization)

#### Health R & D
- No. of health & population related research and development utilized

#### Promotive
- Percentage of Population Availing of Health Services by Type

#### Preventive
- Percentage of the Population Covered by Health Insurance

#### Curative
- Percentage of population availing of health services by type of service

#### Rehabilitative
- Percentage of population using health facilities
- Overall satisfaction with health facilities and services

### NUTRITION

#### Nutrition Status
- Prevalence of underweight children under 5 years of age
- Prevalence of underweight adolescents
- Prevalence of underweight other age group
- Prevalence of underweight-for-age, under height-for-age, underweight-for-height; overweight and obesity
- Prevalence of low birth weight infants
- Proportion of population below minimum level of dietary energy consumption
- Prevalence of low birth weight infants
- Prevalence of CED, overweight and obesity

#### Prevalence of Micronutrient Deficiency
- Prevalence of Vitamin A deficiency
- Prevalence of anemia
- Prevalence of Iodine deficiency

#### Food and Nutrient Intake
- Per Capita Energy/Nutrient Intake
- Percent nutrient adequacy
- Per capita food intake (total, by food groups, food source)
- Per capita consumption per day
- Per Capita Food Supply (per year, per day, per day energy, per day protein, per day fats)
- Total Domestic Supply by Major food Group

#### Prevalence of nutrition-related risk factors to chronic degenerative disease
- Prevalence of hypertension
- Prevalence of high total serum cholesterol
- Prevalence of high triglyceride
- Prevalence of low HDL-c
- Prevalence of high LDL-c
- Prevalence of high fasting blood sugar among adults
<table>
<thead>
<tr>
<th>Prevalence of females with high waist-hip ratio</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Prevalence of Breastfeeding (BF) and Complementary Feeding</th>
<th>Prevalence of exclusive breastfeeding (BF) among 0-6 monts old children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of children not breastfed among 0-24 months</td>
<td>Proportion of children receiving breast milk + water only among 0-6 and 6-9 months old children</td>
</tr>
<tr>
<td>Proportion of children receiving breast milk + water-based liquids/juice among 0-6 and 6-9 months old children</td>
<td>Proportion of children receiving breast milk + other milk among 0-6 and 6-9 months old children</td>
</tr>
<tr>
<td>Proportion of children receiving breast milk + complementary food among 0-6 and 6-9 months old children</td>
<td></td>
</tr>
</tbody>
</table>

### Nutrition Resources

<table>
<thead>
<tr>
<th>Financing</th>
<th>NGA, NGO and LGU funding for nutrition programs/activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of Government Expenditures for Nutrition Programs</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Facilities</th>
<th>No. of hospitals</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of RHUs and BHS</td>
<td></td>
</tr>
<tr>
<td>No. of weighing stations</td>
<td></td>
</tr>
<tr>
<td>No. of weighing scales</td>
<td></td>
</tr>
<tr>
<td>Ratio to Population of Manpower and Facilities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manpower</th>
<th>No. of medical personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of dietitians, nutrition officers, nutrition action officers, barangay nutrition scholars, barangay health workers</td>
<td></td>
</tr>
<tr>
<td>Ratio to population of manpower and facilities (nutrition related activities/program by government and private sector)</td>
<td></td>
</tr>
</tbody>
</table>

### Nutrition Services (Provision & Utilization)

<table>
<thead>
<tr>
<th>Nutrition R &amp; D</th>
<th>No. of health &amp; population related research and development utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotive</td>
<td>Proportion of Population Availing Various Nutrition Programs/Services by Type</td>
</tr>
<tr>
<td>Preventive</td>
<td>Percent of 0 - 5 year old children given vitamin A supplements</td>
</tr>
<tr>
<td>Curative</td>
<td>Percent of households using iodized salt</td>
</tr>
<tr>
<td>Rehabilitative</td>
<td></td>
</tr>
</tbody>
</table>
XVI. TECHNICAL REFERENCE MODEL

A. INTEROPERABILITY STANDARDS

Health data can be moved from one location to another with the sender and recipient having the same understanding and analysis throughout. To achieve this kind of scenario, data must be standardized as well as communication standards. This is where interoperability comes in, i.e. communication standards ensure that health data can be sent from one location to another in its original form and complete in contents. Data standards ensure that data has similar meaning and understanding to the sender and recipient.

Some of the data being collected by the DOH are aggregate indicators, like the Field Health Services Information System. There are also individual patient records on injury, disability and chronic diseases such as HIV/AIDS, MDR TB, diabetes, cancer, COPD, and stroke data being collected from the different hospitals and facilities. Whether the DOH collects aggregate or individual patient data or information, there are data and communication standards to follow for all users to have common understanding and/or interpretation of the data, and transmission protocols to ensure that data is intact.

In the DOH, there are several vertical programs which can share data or information for planning, patient management, program monitoring and evaluation, and research. A patient may get in touch or visit several health facilities, i.e. clinics and hospitals, and can be diagnosed, treated, given the required care and support services. Health facilities have information systems designed to collect the data or information that they need to run the different health programs. There are information from one health program that are useful to the other programs as well. Interoperable health systems make the information available from one health program to another.

With several information systems that are available in the health sector, the DOH shall establish a single data standard and interoperability standard so that each information system will write an interface to the common standard. The objective is to be able to share information since all of the information systems will be using the same interoperability standard. Further, the interoperability standard can be used to submit data for program monitoring and evaluation. Current health information systems need not be replaced but an interface can be programmed to take the data or information from their local system using the standard interoperability format. On the other hand, their health information system must be able to enter data or information using the standard interoperability format.

*The establishment of the DOH’s National Health Data Dictionary will make it possible for the DOH to collect information anywhere into the data warehouse for reporting and analysis. Further updates on what data standards to be used shall be updated accordingly and properly disseminated.*

The Technical Reference Model categorizes the technologies and standards to support the delivery of the service components identified in the business and application reference models.
Note: Other service standards may evolve during implementation and the technical reference model shall be updated accordingly.

<table>
<thead>
<tr>
<th>SERVICE AREA</th>
<th>SERVICE CATEGORY</th>
<th>SERVICE STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SERVICE ACCESS &amp; DELIVERY</td>
<td>Identifies the means for accessing and delivering the DOH services to the users</td>
</tr>
<tr>
<td></td>
<td>ACCESS CHANNELS</td>
<td>Devices to connect to the DOH</td>
</tr>
<tr>
<td></td>
<td>Web Browser</td>
<td>Google Chrome, Firefox, MS Internet Explorer</td>
</tr>
<tr>
<td></td>
<td>Communications – Collaboration</td>
<td>Fax, E-mail</td>
</tr>
<tr>
<td></td>
<td>AUTHENTICATION/ SINGLE SIGN-ON</td>
<td>Process of verifying that a user is authorized to access the services</td>
</tr>
<tr>
<td></td>
<td>Identify Management</td>
<td>MySQL</td>
</tr>
<tr>
<td></td>
<td>INTERNET – INTRANET</td>
<td>Provides the connection between the access devices and DOH services based on the user’s access level</td>
</tr>
<tr>
<td></td>
<td>Internet / Intranet</td>
<td>HTTP, HTTPS</td>
</tr>
<tr>
<td>B</td>
<td>ICT INFRASTRUCTURE</td>
<td>Provides the framework for the application and service components to operate</td>
</tr>
<tr>
<td></td>
<td>NETWORKS</td>
<td>Provides the connections, protocols, switches, and routers that allow data, video and voice to be transferred from one location to another</td>
</tr>
<tr>
<td></td>
<td>Local Area Network Video Conferencing</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SERVERS – COMPUTERS</td>
<td>Computers used to run the applications or services</td>
</tr>
<tr>
<td></td>
<td>Operating Systems</td>
<td>Windows</td>
</tr>
<tr>
<td></td>
<td>Hardware</td>
<td>Updated list and specifications in the DOH Portal</td>
</tr>
<tr>
<td></td>
<td>Peripherals (Printers, Scanners)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>STORAGE</td>
<td>Refers to the medium or devices that store data or information</td>
</tr>
<tr>
<td></td>
<td>Storage Area Network</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Backup &amp; Recovery</td>
<td>Another Server, Tape, Offsite Backup</td>
</tr>
<tr>
<td></td>
<td>DELIVERY SERVERS</td>
<td>Software that provides special services to support the application or interfaces</td>
</tr>
<tr>
<td></td>
<td>Web Server</td>
<td>Apache</td>
</tr>
<tr>
<td></td>
<td>Application and Database Server</td>
<td>MySQL, Joomla, PHP</td>
</tr>
<tr>
<td></td>
<td>APPLICATION DEVELOPMENT</td>
<td>Programming Languages</td>
</tr>
<tr>
<td>SERVICE AREA</td>
<td>SERVICE CATEGORY</td>
<td>SERVICE STANDARD</td>
</tr>
<tr>
<td>-------------</td>
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<tr>
<td></td>
<td>Refers to the processes of developing an application system or services</td>
<td>Flowcharting, MS Visio, Text Editor, Notepad</td>
</tr>
<tr>
<td>6</td>
<td>DESKTOP HARDWARE</td>
<td>Operating System, Windows</td>
</tr>
<tr>
<td></td>
<td>Physical devices, operating system, and applications can be used by the users</td>
<td>Desktop Computer, Updated list and specifications in the DOH Portal</td>
</tr>
<tr>
<td>C</td>
<td>APPLICATION – WEB SERVICES</td>
<td>MS Office, Word, Excel, Powerpoint</td>
</tr>
<tr>
<td>1</td>
<td>PRESENTATION INTERFACE</td>
<td>Static Presentation, HTML</td>
</tr>
<tr>
<td></td>
<td>Dynamic Server Side Presentation, PHP, Content Delivery, CSS, HTML, XHTML</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>SECURITY</td>
<td>Identity Management, MySQL</td>
</tr>
<tr>
<td></td>
<td>Certificate, PKI</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>SERVICE INTEGRATION</td>
<td>Format - Classification, XML</td>
</tr>
<tr>
<td></td>
<td>Key to Interoperability</td>
<td>Types – Validation, XML</td>
</tr>
<tr>
<td>1</td>
<td>DATA TRANSFORMATION</td>
<td>Service Discover</td>
</tr>
<tr>
<td></td>
<td>Formats the data and translates between different formats</td>
<td>Service Interface, Orchestration Engine</td>
</tr>
<tr>
<td>2</td>
<td>APPLICATION INTEGRATION</td>
<td>Messaging, SOAP</td>
</tr>
<tr>
<td>SERVICE AREA</td>
<td>SERVICE CATEGORY</td>
<td>SERVICE STANDARD</td>
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<tr>
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<tr>
<td></td>
<td>Provides connections and transport of data or information</td>
<td>Adapters</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enterprise Service Bus</td>
</tr>
<tr>
<td>E</td>
<td>DATA SERVICE AREA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data Structure, Data Definition, Data Location, Data Grouping</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DATA DESCRIPTION</td>
<td>National Health Data Dictionary</td>
</tr>
<tr>
<td></td>
<td>Defines the structure and format of the data</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DATA CONTEXT</td>
<td>Taxonomy</td>
</tr>
<tr>
<td></td>
<td>Defines where the data resides</td>
<td>XML</td>
</tr>
<tr>
<td>3</td>
<td>DATA SHARING</td>
<td>Content Management</td>
</tr>
<tr>
<td></td>
<td>Refers to servers that classify and categorize the data, ensure its availability, and protocols to connecting to the databases</td>
<td>DOH Web Portal</td>
</tr>
<tr>
<td>4</td>
<td>DATA STANDARDS</td>
<td></td>
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<tr>
<td></td>
<td>For Evaluation:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNOMED</td>
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<td></td>
<td>ICPC</td>
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<tr>
<td>5</td>
<td>INDICATOR STANDARDS</td>
<td></td>
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<td></td>
<td>For Evaluation:</td>
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<td></td>
<td>SMDX-HD</td>
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<tr>
<td></td>
<td></td>
<td>Document Management</td>
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<td></td>
<td></td>
<td>UHMIS</td>
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<td></td>
<td></td>
<td>Database Connectivity</td>
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<tr>
<td></td>
<td></td>
<td>HTTP, HTTPS</td>
</tr>
<tr>
<td>F</td>
<td>e-HEALTH INFOSTRUCTURE</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>DATA STANDARDS</td>
<td></td>
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<tr>
<td></td>
<td>National Health Record No.</td>
<td></td>
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<td></td>
<td>In conformity to the National Center for Health Facility Development – Medical Record Standards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provider Identification</td>
<td>PRC License Number</td>
</tr>
<tr>
<td></td>
<td>Facility Identification</td>
<td>DOH National Health Data Dictionary</td>
</tr>
<tr>
<td></td>
<td>Disease Classification</td>
<td>WHO ICD-10</td>
</tr>
<tr>
<td></td>
<td>Examinations / Procedures /</td>
<td>DOH HOMIS</td>
</tr>
<tr>
<td>SERVICE AREA</td>
<td>SERVICE CATEGORY</td>
<td>SERVICE STANDARD</td>
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<tr>
<td>Laboratory</td>
<td></td>
<td></td>
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<tr>
<td>Drugs</td>
<td>FDA-NCPAM Drug Price Monitoring System</td>
<td></td>
</tr>
<tr>
<td>Field Health Services Data</td>
<td>DOH FHSIS</td>
<td></td>
</tr>
<tr>
<td>e-Claims</td>
<td>PhilHealth</td>
<td></td>
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<tr>
<td>Others</td>
<td>DOH National Health Data Dictionary</td>
<td></td>
</tr>
<tr>
<td>Geographic Codes</td>
<td>NSCB - PSGC</td>
<td></td>
</tr>
<tr>
<td>G INTEROPERABILITY STANDARDS</td>
<td>XML</td>
<td></td>
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<tr>
<td></td>
<td>HL7 = For Evaluation</td>
<td></td>
</tr>
</tbody>
</table>
B. CENTRAL OFFICE NETWORK LAYOUT
C. CHD’S NETWORK LAYOUT

Basic LAN Set-up in Centers for Health Development

Legend:
- Switch
- Computer Workstation in the Office
- Fire Wall
- Printer
- Computer Server

Department of Health – Enterprise Architecture

DOH-IMS
D. DOH HOSPITALS AND MEDICAL CENTERS NETWORK LAYOUT

Basic LAN Set-up in Hospitals and Medical Centers

*Some Hospitals provide separate computer for internet connection while others allow the entire network to connect to internet.

*In some Hospitals, the Cashier and Billing are located in the same room.

*In some Hospitals, the Medical Records and PHIC are located in the same room.
E. DATABASE WAREHOUSE MODEL

[Diagram showing relationships between different data banks and entities such as DOH, LGUS, HF, and Nat'l Gov't.]
F. DOH WEB SERVICES

The DOH Web Services is a collection of web services that are used to facilitate the sharing of information. The DOH’s National Health Data Dictionary provides the foundation for the exchange of health information. There are two (2) major kinds of users, Type 1 and Type 2:

1. User Type 1: Health care professionals, health facilities, drug test laboratories, pharmaceutical companies, and others who have their services and need to validate/verify some data from the DOH to be able to use their system.

2. User Type 2: A user who places information request to the system. Request is sent via the HTTP query to the DOH web server, which in turn fetches the right information and displays the needed information back to the user’s screen.

INTEGRATED DRUG TESTING OPERATIONS
DATA UPLOADING
DATA DOWNLOADING

PATIENT RECORD MANAGEMENT
HOMIS – PHILHEALTH ONLINE CLAIMS ELIGIBILITY VERIFICATION SYSTEM
XVII. EA STRATEGIC ACTIONS

To help ensure accessibility and quality of health care to improve the quality of life of all Filipinos, and efficiently and effectively accomplish its functions, the Department of Health shall utilize and further strengthen the use of ICT through the following mechanisms or actions:

1. Continuing development and/or upgrade of the infrastructure for ICTs to promote equitable, affordable and universal access of data, information and knowledge by health managers, providers, partners, the public and other stakeholders:
   a. Replace obsolete and/or end of life ICT systems;
   b. Upgrade office automation capacities of technical and administrative staff replacing archaic and unserviceable computer systems;
   c. Further adopt new technologies for communication with the field offices and ensure better daily communication, and more importantly better and faster responses to health emergencies and disease outbreaks; Further set call and SMS facilities to provide more communication channels for internal and external support;

2. Continuing development and implementation of e-Health services and encourage public and private partnership;

3. Continuing mobilization of the multi-sectoral collaboration for determining evidence-based eHealth standards and norms and to share the knowledge of cost-effective models to ensure quality, safety and ethical standards and respect for the principles of confidentiality of information, privacy, equity and equality; Also, built partnerships among health care consumers, providers, experts and managers and establish communities of practice among experts and interested stakeholders.

4. Continuing establishment of networks of excellence for best and/or exemplary practices on policy coordination and technical support for health care delivery, service improvement, information to citizens, capacity building and surveillance;

5. Continuing development and implementation of national electronic public health information system and patient registries and to improve by means of information, the capacity for surveillance of, and rapid response to, disease and public health emergencies and policy development;

6. Continuing development, integration/harmonization of systems, e.g. licensing and/or regulatory services, financial, procurement, and logistics systems, to make it more efficient and accessible and allowing electronic transaction;

7. Strengthening support to monitoring and evaluation, research and knowledge management systems to improve rational performance assessment system, evidence-based health policy development, and decision making process;

8. Enhancement of the drug systems and integrating health statistics database with systems for drug inventory, drug price monitoring system, and procurement;

9. Upgrading of the DOH NHDD definitions, recording, collection, and reporting of hospital statistics of national and local governments, including private hospitals for planning, budgeting, costing, and pricing of services; Further deploy hospital operations and management information systems in various DOH hospitals;
10. Updating of the Health Human Resource Information System, nationwide;

11. Enhancement of the health portal;

12. Enhancement of the health promotion systems and activities; and

13. Updating/Upgrading of the DOH warehouse for data and information and knowledge products with the Philippine Health Information Network composed of the DOH, NSCB, NSO, Philhealth, PCHRD-DOST, academe and other health and health-related data producing and using agencies and provide access to various stakeholders.

14. Further using geographic information system, biometrics to enhance utilization and comprehension of various information systems

15. Electronic archiving of institutional memories, important shared documents as part of DOH regulatory functions, various publications, manuals, plans, standards, policies, library and resource centers holdings, issuances, and others.

XVIII. STRATEGY FOR PUBLIC ACCESS

ICT strategy for public access will be through an enhanced health portal, inquiries through SMS and various web-based systems allowing electronic transactions like submission and monitoring of application for licensing, accreditation or registration.

Currently, the Department of Health is presently providing information and services to the public through its website or portal at http://www.doh.gov.ph. Information and services are as follows:

1. Health Advisories
2. Health Policies and Laws
3. Health Programs
4. Health Knowledge Products
5. Publications on researches, SOPs, standards,
6. Forums
7. Frequently Asked Questions
8. Licensing, and Regulation/Accreditation Data and Information
9. Press Releases
10. DOH Information on its Profile, Milestone, Organizational Chart, Officials and Location Map
11. Links to the different DOH Partners, Medical Societies, and other Government Agencies
12. Access or links to the different DOH offices, hospitals, attached agencies, libraries and learning resource centers, and DOH intranet
13. Announcements, News
14. Procurement Opportunities
15. Registries
16. Call for Papers/Proposals
17. Vacancies
18. Access to foreign publication and databases, others

The DOH portal will also serve as the interface to connect to the Unified Health Management Information System where all DOH Information Systems and Reports are located, i.e. Electronic Job Posting System, Public Assistance Information System, Electronic Drug Price Monitoring System, Uploading of Data from each health facilities to the Central Office, and others.
The use of Short Messaging System (SMS) as a contact point to the DOH has been used for various projects such as during SARS epidemic. Its use will be reviewed and expanded to include health promotion activities.
XIX. ANNEX 1.0 - DOH OFFICES AND FUNCTIONS
<table>
<thead>
<tr>
<th>#</th>
<th>Office</th>
<th>General Functions</th>
<th>Component Units</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Office of the Secretary</td>
<td>1. Provides overall leadership and policy directions to the health sector.</td>
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<td></td>
<td></td>
<td>2. Exercises general supervision and control of the DOH and its attached agencies.</td>
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<td>3. Advises the President of the Philippines on matters pertaining to health.</td>
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<td></td>
<td></td>
<td>4. Promulgates standards, rules and regulations necessary to carry out national health goals, plans and programs.</td>
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<td></td>
<td></td>
<td>5. Performs other functions provided by law, or appropriately assigned by the President of the Philippines.</td>
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</tbody>
</table>
Bureau of Food and Drugs (BFAD)

**General Functions**

Develops plans, policies, programs and strategies for regulating processed foods, drugs and other related products.

Formulates rules, regulations and standards for licensing and accreditation of processed foods, drugs and other related products.

Conducts licensing and accreditation of processed foods, drugs and other related products.

Provides technical, consulting and advisory services to and develops capability of field offices on licensing and enforcement of laws, rules and regulations pertaining to processed foods, drugs and other related products.

Monitors, evaluates and ensures compliance of manufacturers, distributors, advertisers and retailers of processed foods, drugs and other related products to health rules and regulations and standards of quality.

Advises the Secretary and the Undersecretary of Health on matters pertaining to regulation of processed foods, drugs and other related products.

**Policy, Planning and Advocacy Division**

1. Develops plans, policies and programs pertaining to the regulation of processed foods, drugs and other related products.

2. Provides technical information and assistance to clients and the general public on matters pertaining to food and drug laws, regulations, functions and services.

3. Develops and maintains a management information system pertaining to processed foods, drugs and other related products.

4. Promotes rational drug use, self reliance and tailored procurement thru the implementation of the Generics Law and the Philippine National Drug Formulary (PNDF)

5. Provides coordination of activities related to drug price monitoring and drug policies.

6. Conducts pharmacoepidemiological and pharmacoeconomic analysis.
Regulation Division I

1. Conducts inspection and issues licenses for the operation of establishments involved in the importation, exportation, distribution and retailing of processed foods, drugs, medical devices, in vitro diagnostic reagents, cosmetics and household hazardous substances.

2. Monitors and ensures quality of processed foods, drugs and other related products through collection of samples from outlets and ports of entry.

3. Enforces seizure, confiscation and condemnation orders covering products violating food and drug laws, regulations and standards.

4. Provides assistance in the monitoring of adverse drug reactions.

5. Develops the technical capability of Food and Drug Regulation Officers assigned at field offices.

Regulation Division II

1. Conducts inspection and issues licenses for the operation of establishments involved in the manufacture and re-packing of processed foods, drugs, medical devices, in vitro diagnostic reagents, cosmetics and household hazardous substances.

2. Monitors and ensures compliance of manufacturers with requirements of Good Manufacturing Practices (GMP).

3. Enforces seizure, confiscation and condemnation orders covering products violating food and drug laws, regulations and standards.

4. Develops the technical capability of Food and Drug Regulation Officers assigned at field offices.

Product Services Division

1. Formulates standards and guidelines for the registration of processed foods, drugs, cosmetics, medical devices, in vitro diagnostic reagents and household hazardous substances.

2. Evaluates and processes application for product registration and listing.

3. Issues certificates of product registration and certificates of product listing.
4. Provides assistance in the monitoring of products violating food and drug laws, regulations and standards

Laboratory Services Division

Conducts laboratory tests on finished products to determine compliance with standards of safety, efficacy, purity and quality.
Conducts tests on packaging materials used for foods, drugs, cosmetics, medical devices and other related products.
Produces properly bred laboratory animals used for toxicological examinations, bioassay and biological research and development.

Administrative Division

Provides general administrative and logistic support services such as personnel, finance, communication, documentation, security and facility operation and maintenance services.

Legal Division

Provides legal advice in the enforcement of food and drug laws and regulations.
Conducts administrative proceedings and quasi-judicial hearings on cases related to food and drug laws and regulations.
Prepares recommendations, resolutions and other administrative issuances pertaining to regulation of processed foods, drugs and other related products.
Conducts investigation of consumer complaints on products regulated by the Bureau.
Monitors product advertisements and promotions to check compliance with existing guidelines on medical and nutritional claims.
General Functions

1. Formulates and enforces policies, standards, regulations and guidelines on the production, import, export, sale, promotion, distribution and use of ionizing and non-ionizing radiation devices in medicine, dentistry, veterinary medicine, commerce and industry, education and training, research, anti-crime and household activities.

2. Undertakes radiation protection survey and evaluation of radiation facilities and the activities thereat.

3. Issues licenses, permits, registrations and accreditation certificates for radiation facilities, devices and technology.

4. Provides technical assistance related to the radiation health component of the national radiological emergency preparedness and response plan.

5. Provides technical assistance, consulting and supervision, advisory services to and develops capability of field offices in implementation and enforcement of laws, rules and regulations pertaining to radiation facilities, devices and technology.

6. Develops monitors and evaluate compliance, surveillance and quality assurance programs for radiation facilities and devices.

7. Conducts health technology assessments, studies and researches on radiation devices and technology.

Medical Physics, Dosimetry and Testing Laboratory Division

1. Undertakes testing and calibration of radiation measuring equipment, radiation devices, medical devices and other health-related devices.

2. Provides technical assistance in medical physics and radiation dosimetry.

3. Operates and maintains the Secondary Standard Dosimetry Laboratory (SSDL).

4. Provides radiation dosimetry and decontamination services during nuclear or radiological emergencies.
5. Conducts training courses in radiation dosimetry, radiation protection, quality assurance and related topics for radiation workers.

6. Conducts studies and researches in medical physics, radiation dosimetry and device testing.

Medical Non-Radiation Device Regulation Division

1. Formulates and enforces policies, standards, regulations and guidelines on the production, import, export, sale, promotion, distribution and use of medical non-radiation devices and technology.

2. Conducts inspection of production and storage facilities of medical non-radiation devices.

3. Issues licenses, permits, registration and accreditation certificates for medical non-radiation devices, technology and device production facilities.

4. Provides technical assistance and supervision, consulting and advisory services to and develops capability of field offices in implementation and enforcement of laws, rules and regulations pertaining to medical non-radiation devices, technology and device production facilities.

5. Conducts health technology assessments, studies and researches on medical non-radiation devices and technology.

Health-Related Device Regulation Division

1. Formulates and enforces policies, standards, regulations and guidelines on the production, import, export, sale, promotion, distribution and use of non-medical and non-radiation health-related devices and technology.

2. Conducts inspection of production and storage facilities of non-medical and non-radiation health-related devices and technology.

3. Issues licenses, permits, registration and accreditation certificates for non-medical and non-radiation health-related devices, technology and device production facilities.

4. Provides technical assistance and supervision, consulting and advisory services to and develops capability of field offices on implementation and enforcement of laws, rules and regulations pertaining to non-medical and non-radiation health-related devices, technology and device production facilities.
1. Develops policies, standards and guidelines on family health.
2. Develops plans, programs and projects to provide packages of services for family health.
3. Sets national health objectives and priorities for family health.

Assists and strengthens capacity to measure and analyze the burden of diseases on families.

Provides monitoring and evaluation schemes to measure impact of health services on families.

Technical Assistance and Resource Development Division

Provides technical assistance and expert services to collaborating and implementing agencies on matters pertaining to family health.

Develops capability of health sector agencies and organizations in the implementation of programs and projects related to family health.

Promotes coordination and collaboration with partner agencies and organizations on matters pertaining to family health.

Mobilizes resources to assist collaborating and implementing agencies and organizations.

General Functions

Plans, Program and Project Development Division

Develops policies, standards and guidelines on environmental and occupational health.

Develops plans, programs and projects on environmental and occupational health.

Sets national health objectives and priorities for environmental and occupational health.
Assists and strengthens capacity to measure and analyze the burden of health hazards and risks associated with environmental and work-related factors.

Provides monitoring and evaluation schemes to measure impact of interventions to manage health hazards and risks associated with environmental and work-related factors.

Technical Assistance and Resource Development Division

1. Provides technical assistance and expert services to collaborating and implementing agencies on matters pertaining to environmental and occupational health.

2. Develops capability of health sector agencies and organizations in the implementation of programs and projects related to environmental and occupational health.

3. Promotes coordination and collaboration with partner agencies and organizations on matters pertaining to environmental and occupational health.

4. Mobilizes resources to assist collaborating and implementing agencies and organizations.
General Functions
General Functions

Formulates plans, policies, programs, projects and strategies for organizational and financial restructuring and development of hospitals, laboratories and other health facilities.

Evaluates status of government hospitals and other health facilities for technical and financial viability and conversion to fiscally autonomous entities.

Provides technical assistance and expert services to implementing agencies on matters pertaining to organizational and financial restructuring and development of hospitals, laboratories and other health facilities.

Reviews administrative and legal issues related to conversion of government hospitals and health facilities to fiscally autonomous entities.
HEALTH EMERGENCY MANAGEMENT STAFF (HEMS)

General Functions

1. Develops plans, policies, programs and strategies for health emergency preparedness and response.

Develops health sector capability for an effective and responsive national health emergency management system.

Organizes and coordinates efforts of the health sector for an integrated response to health emergencies.

Advises the Secretary of Health on matters pertaining to health emergency management.

Health Emergency Preparedness Division

Develops plans, policies, programs, standards and guidelines for the prevention and mitigation of health emergencies.

Provides leadership in organizing and coordinating health sector efforts for health emergency preparedness.

Provides technical assistance, capability building, and consulting and advisory services to implementing agencies.

Conducts or coordinates studies and researches related to health emergencies.

Health Emergency Response Division

Maintains an Operations Center to serve as an alert system to monitor health and health-related emergencies.

Provides leadership in the mobilization and deployment of health teams in anticipation of or in response to health emergencies.

Coordinates and integrates health sector response to health emergencies.
PHILIPPINE NATIONAL ADVANCE IMMUNODEFICIENCY SYNDROME COUNCIL (AIDS) COUNCIL (PNAC)

General Functions

Advise the President of the Philippines regarding the policy development for the prevention and control of HIV/AIDS

Serves as venue for intensive policy discussions between the government and NGOs to ensure that policies respond to problems related to human immunodeficiency virus and AIDS.
HEALTH POLICY DEVELOPMENT AND PLANNING BUREAU (HPDPB)

General Functions

1. Develops the health sector policy, legislative and research agenda and the national plans, goals and objectives for health.

2. Coordinates and provides the mechanisms for institutionalizing, implementing, monitoring and evaluating the health sector policy, legislative and research agenda and the national health plans, goals and objectives.

3. Provides technical assistance, consulting and advisory services relative to health policy development, legislation, planning and research.

4. Advises the Secretary of Health on matters pertaining to national health policies and legislation, national health plans and objectives, health research and development.

Health Research Division

Formulates and implements the national research agenda for health.

Provides technical assistance, consulting and advisory services on matters pertaining to health research and development.

Develops and coordinates sectoral and internal systems and processes for health research including maintenance of a sustainable health research network.

Manages the health research process including review of health research proposals, implementation and monitoring of research, and dissemination of research results.

Health Planning Division

Formulates the national health plans, goals and objectives including investment and budget plans for health.

Provides technical assistance, consulting and advisory services on matters pertaining to health planning, program and project development.

Develops and coordinates sectoral and internal systems and processes for health planning and program development.
Manages the health planning process including monitoring and review of national programs, projects and expenditures for health.

Health Policy Division

Formulates the health sector policy agenda covering health service delivery, health regulation, health care financing and organizational development.

Provides technical assistance, consulting and advisory services on matters pertaining to health policy development.

Develops and coordinates sectoral and internal systems and processes for health policy development.

Manages the health policy development process including monitoring and review of policies pertaining to health.

Legislative Liaison Division

Formulates and conducts advocacy for the legislative agenda for health.

Provides technical assistance, consulting and advisory services on matters pertaining to health legislation.

Coordinates with the executive and legislative branches of the government on matters pertaining to health legislation.

Manages the legislative liaison process including monitoring and review of legislative proposals pertaining to health.
Health Human Resource Development Bureau (HHRDB)

General Functions

Formulates plans, policies, programs and standards related to the production, deployment, utilization and development of human resource for the health sector.

Provides relevant training programs for specific categories of health workers, and technical assistance and expert services to collaborating and implementing agencies.

Develops benefits and compensation packages for health human resource.

Conducts studies and researches on health human resource.

Advises the Secretary of Health on matters pertaining to health human resource development.

Health Human Resource Planning and Standards Division

Develops and maintains a health human resource information system.

Develops and monitors standards on health human resource.

Conducts researches on health human resource development and management.

Develops health human resource systems responsive to health trends and needs.

Convenes and coordinates advisory bodies for different categories of health human resource.

Health Human Resource Management Division

Develops and implements plans and programs on the recruitment, selection, deployment and utilization of health human resources.

Institutes career development systems in the health sector.

Health Human Resource Training Division

Identifies training needs of specific categories of human resource in the health sector.
Develops, coordinates, facilitates and implements training programs for health human resource.

Monitors and evaluates training programs.
Bureau of International Health Cooperation (BIHC)

General Functions

1. Develops standards, mechanisms and procedures for international health cooperation.

2. Provides services related to mobilization, coordination, management and assessment of externally supported health projects and initiatives.

3. Provides services related to promotion, coordination and mobilization of health sector support for international initiatives in health.

4. Advises the Secretary and the Undersecretary of Health on matters pertaining to international health programs, projects and initiatives and externally supported national and local health projects.

International Relations Division

Establishes linkages and collaboration with international development organizations, including bilateral and multilateral agencies, inter-country and/or inter-regional networks, international NGOs and national agencies involved in development assistance and international health cooperation.

Identifies and analyzes emerging global issues and concerns that could impact health in the Philippines and makes recommendations to address them.

Oversees the formulation and coordination of international health policies and commitments, including the optimal participation of country representatives in international health forums.

Develops and implements a networking and advocacy strategy that will push the Philippine agenda in international meetings/conferences and in international experts bodies and technical working groups.

Develops policy guidelines and inter-agency cooperation frameworks on international health issues affecting the country to ensure policy coherence and better coordination among relevant concerned government agencies.

Monitors and evaluates international commitments in relation to health sector reform and development.

Facilitates access to and availment of international fellowships, scholarships and training opportunities.

Develops policy guidelines for project mobilization, implementation and evaluation, using multi-project approach to ensure coherence and consistency.
Recommends measures to ensure the sustainability of projects and to mainstream good practices and lessons learned.

Ensures appropriate documentation, reporting and dissemination of FAPs.

Develops guidelines and systematize screening and processing of international travel grants at all levels.

Develops and maintains a database of donor agencies/organizations, covenants/instruments, training institutions/experts and other information systems related to the enhancement of international relations and health cooperation.

Unified Project Management Division

Establishes an integrated and coordinated system for the management of development cooperation or foreign-assisted projects (FAPs) to achieve optimal use of scarce resources.

Ensures that FAPs’ objectives are in line with overall health thrusts and priorities and are complementary to and supportive of national initiatives and programs.

Provides overall guidance for FAPs implementation and monitors compliance with financial and physical benchmarks and targets as well as with government rules and regulations.
Bureau of Local Health Development (BLHD)

General Functions

1. Provides frameworks, standards, systems and procedures for local health systems development.
2. Strengthens regional capacities to support and assist local health systems.
3. Strengthens public and private sector collaboration and networking to develop and support local health systems.
4. Develops mechanisms to sustain local health systems.
5. Advises the Secretary and the Undersecretary of Health on matters pertaining to local health coordination and local health systems development.

Local Health Systems Development Division

Formulates and enhances technical frameworks, policies and standards to support health systems development.

Develops programs and projects on local health systems in different setting (e.g. small islands health systems, urban health development systems, inter-local health zones, local health care financing systems among others).

Provides technical assistance and develop mechanisms to strengthen sub-national and local capacities to support local health systems.

Integrates plans for various foreign-assisted projects designed to support capacity for health systems development.

Oversees the development and documentation of specific local projects as demonstration sites and models for local health systems.

Monitors and evaluates the national, sub-national and local levels in the provision of support and assistance to the development and management of local health systems.

Inter-Sectoral Coordination Division
1. Promotes and coordinates inter-governmental activities, initiatives and projects related to local health systems development.

2. Develops processes to make operational technical frameworks, programs or projects for local health systems.

3. Organizes technical experts groups and human resource networks for local health systems development.

4. Identifies and develops mechanisms for private sector collaboration and participation in local health systems development.

5. Advocates and mobilizes for quality health service delivery at the sub-national and local levels.

6. Liaises with concerned/appropriate agencies/institutions/organizations for local health systems development.

7. Monitors commitment of stakeholders to collaborative undertakings related to the formulated integrated health strategic plan.

8. Troubleshoots flaws in local health systems development and fills in the gaps.
INFORMATION MANAGEMENT SERVICE (IMS)

Formulates plans, policies, programs and standards for management information systems and information technology development.

Develops and manages the management information systems for the DOH.

Develops and manages the information technology infrastructure and services for the DOH including corporate data and telecommunications services.

Develops and manages the health information resources, library services and document tracking and archiving services for the DOH.

Advises the Secretary of Health on matters pertaining to information management services.

Database and Network Management Division

Plans, develops and administers DOH database including data planning, processing, manipulation and storage and ensures data integrity and security.

Manages information infrastructure to include the computer center operation, data and telecommunication network management, Internet and intranet and computer system upgrades, procurements and maintenance.

Conducts researches on available new technology solutions and ensures that DOH is informed on rapidly advancing computing technology as it applies to DOH functions.

Conducts technology contingency and capacity planning.

Develops and maintains programming templates and shells.

 Develops, implements and maintains IT standards related to database and network management.

Provides technical support including training and continuing end-user education related to databases and network operations and management.

Knowledge Management Division

Provides services related to document and records management including collection, dissemination, sharing and access to various corporate data and information using various technologies.

Operates and maintains Internet and intranet application systems.

Operates and maintains DOH telecommunication and data systems.
Manages DOH library resources including software licenses and various documentations of IT application systems.

Provides IT user support services including training, education and support management related to information management.

Provide IT consulting services including user coordination, local system development support and information retrieval.

Systems and Software Development Division

Provides services related to information system planning, research and development, including corporate database design, systems analysis, design and integration and maintenance.

Provides services related to software and web page development and management including systems and software configuration management, approval of information systems changes, upgrades and procurements.

Develops systems audit and control and systems security.

Develops and operates national health information

Provides information technology support services including training and education and development and implementation of standards related to system and software engineering
FINANCE SERVICE (FS)

General Functions

Coordinates budget preparation activities.

Coordinates financial planning including program budgeting and review based on national policies, plans and objectives for health.

Serves as fiscal comptroller of the DOH and provides services related to cash management and accounting performance.

Advises the Secretary of Health on matters pertaining to finance services.

Budget and Cashiering Division

Coordinates preparation and implementation of the annual and long-term budget estimates, financial and work plans in support of the DOH’s operations, plans and programs.

Provides technical assistance to subordinate budget units in the development and improvement of budgetary methods and procedures.

Prepares annual Agency Budget Matrix (ABM) as the basis for the issuance of annual cash programs by month and Special Allotment Release Order (SARO) and used as the bases for sub-allotment and transfer to field offices, LGUs, NGOs and other agencies, including foreign assisted agencies.

Accounting Division

1. Maintains general and subsidiary accounting records and books of account for the preparation and submission of financial reports to management, administrative and legislative bodies and foreign donors.

2. Certifies availability of appropriations and allotments and process vouchers, payrolls, job orders, contracts and other financial documents for local and foreign programs and projects.

3. Develops department-wide accounting policies and procedures in consonance with related policies emanating from the DBM, COA and other government instrumentalities.
ADMINISTRATIVE SERVICE (AS)

General Functions

Provides the DOH with efficient and effective services related to personnel, legal and general services including housekeeping, security, facilities, equipment and ground maintenance and other related services.

Advises the Secretary of Health on matters pertaining to personnel, legal and general administrative services.

Personnel Services Division (transferred to the HHRDB)

Formulates and implements policies standards and guidelines for the DOH on matters pertaining to personnel recruitment, selection and placement.

Develops a personnel incentive and benefit system.

Encourages improvement of employee performance and efficiency through annual performance appraisal.

Develops and maintains a personnel information system.

General Services Division

Provides general custodial services to include housekeeping, maintenance of equipment, buildings and grounds.

Manages and supervises janitorial and security services.

Legal Services Division (transferred to the Office of the Secretary)

Provides the DOH with legal advice on all policy, programs and operational matters.

Acts as counsel for the DOH and its personnel in legal cases.
Procurement and logistics Service (PLS)

General Functions

1. Formulates plans, policies, standards and guidelines related to procurement and logistics management of the DOH.

2. Procures, maintains and manages supplies, materials and services to support the logistical requirements of the DOH.

3. Advises the Secretary of Health on matters pertaining to the procurement of goods and materials.

Procurement Division (Central Office Bids and Awards Committee Secretariat)

Develops an annual procurement program for the DOH

Provides assistance to field offices of the DOH on matters pertaining to procurement of drugs, medicines, medical supplies, health equipment and other general supplies and materials.

Ensures that all offices and units adhere to procurement processes and procedures.

Materials Management Division (Transferred to Administrative Service)

Ensures proper handling and storage; adequate and timely distribution of drugs, medicines, medical supplies, health equipment and other general office supplies and materials.

Maintains and updates inventory of goods, supplies and materials.
OFFICE OF SPECIAL CONCERNS

General Functions

Provide over-all coordination of implementation special health concerns such as medical tourism, drugs and substance abuse, alternative health care, specialty tertiary care, etc.

Lead and oversee implementation of the medical tourism program and drug and substance abuse program and other special health concerns in partnership with the local government units, private sector and other government agencies.

FIELD IMPLEMENTATION AND COORDINATION OFFICE

General Functions

Provide over-all coordination of the Centers for Health Development, PhilHealth Regional Offices, POPCOM Regional Offices and retained Health facilities/hospitals.

Oversee and lead in the implementation of health reforms in partnership with the local government units, private sector and other government agencies.
CENTERS FOR HEALTH DEVELOPMENT

General Functions

Develops and implements, plans, programs and projects as stipulated in national policies, goals and objectives for health

Exercises general supervision and control and over, retained facilities within the region

Provides advisory, consultancy, training assistance technical and logistics to local government units, Non-Government Organization, Peoples Organizations, private organizations in the provision of efficient and effective health services to the people.

Coordinates with regional offices of other departments, offices and agencies in the region on matters pertaining to health services

Advises the Secretary of Health on matters pertaining to health service delivery regulation, financing in the regional and local areas.

Health Operations Division

Develops plans programs and projects in consonance with national policies goals and objectives

Monitors and evaluates the implementation of health programs and projects by the Local Government Units and other implementing partners.

Provides advisory, consultancy, training, technical assistance to implementing units and other partners in matters pertaining to the implementation of local health programs and projects.

Designs and operationalizes advocacy and other health promotion and education activities.

Conducts researches relative to delivery, regulations and financing at local levels.

Conducts epidemiology and disease surveillance activities

Health Regulation, Licensing and Enforcement Division

Implements/enforces policies rules and standards on matters related to the regulation of health facilities and services, food and drugs, health and health related technology and devices

Manages and oversees the operations of satellite laboratories for food and drugs regulations and equipment maintenance workshops
Ensures compliance of providers, manufactures, distributors, advertising, retailers of health services and facility health products and devices and technology to health rules and regulations and standards of quality

Local Health Assistance Division

Establishes and fosters continuous coordination linkages with local government units, people organization, non-government organizations within the region

Provides technical consultative and advisory services to local government units, people organization and non-government organizations within the region on matters pertaining to the local health services/through the local health boards and DOH representatives

Facilitates the conduct of health program reviews and consultative with implementing partners.

Assists/ builds up capability of local government units in responding to emergencies/disasters in the region

Develops and maintains local health information system to ensure timely and accurate inputs for decision-making and proper development

Management Support Division

Provides the center with efficient and effective services related to personnel, legal financial management, general services to include records management, communication systems custodial and security services

Health Human Resource Development Unit

Develops and implements plans and programs related to the production, deployment, utilization and development of human resources in the region based on national policies and standards

Provides relevant training programs and continuing education for specific categories of health workers in the region

Provides technical assistance and expert advice to collaborating and implementing agencies and partners

Health Planning Unit

Formulates/develops policies, plans and programs including investments for health on the whole region based on local situation.
Provides technical assistance, consultative, training and advisory services on matters pertaining to health planning, program and project development.

Develops and operationalizes regional and internal systems and processes for health planning and programs development.

Manages the health planning process including monitoring and review of regional programs, projects and expenditures for health.

Internal Audit Unit

Monitors the financial and internal operations and performance of the center and retained facilities including review of systems and procedures to make sure that all resources are managed and utilized in accordance with prescribed laws and regulations.

Provides assistance to managers of the centers and retained facilities in optimizing the internal operating efficiency of these centers/facilities.
DRUG REHABILITATION CENTERS

GENERAL FUNCTIONS

Provide drug rehabilitation services to drug and substance abusers

Conduct drugs and substance abuse preventive programs in partnership with the local government units, private sector and other government agencies
HOSPITALS, MEDICAL CENTERS & SANITARIA

General Functions

Provide curative care services

Provide some specific public health services, rehabilitation and ancillary services or allied medical services
Philippine Institute of Traditional and Alternative Health care (PITAHC)

The PITAHC was created though Republic Act 8423 on July 8, 1997 to accelerate the development and provision of traditional and alternative health care products, services and technologies in the Philippines that have been proven safe, effective and affordable.

General Functions

To encourage scientific research on and develop traditional and alternative health care systems that has a direct impact on public health care;

To promote and advocate the use of traditional /alternative health care modalities that have been proven safe, effective, cost-effective and consistent with government standards on health care practice,

To develop and coordinate skills training courses for various forms of traditional and alternative care modalities,

To formulate standards, guidelines and codes of ethical practice appropriate for the practice of traditional and alternative health care as well as in the manufacture, quality control and marketing of different traditional and alternative health care materials, natural and organic products, for approval and adoption by the appropriate government agencies,

To formulate policies to strengthen the role of traditional and alternative health care delivery system; and,

To promote traditional and alternative health care in international and national conventions, seminars and meetings.

COMPONENT UNITS

Research and Development Division is responsible for the conduct of priority TAHC research agenda that will have direct impact on public health care.

Public Information Division takes charge of promotion and advocacy of PITAHC programs, products, services, facilities and activities through multi-media approach.

Education and Training Division handles various training activities.

Special Projects Division is responsible for implementation and management support projects for PITACH.

Standards and Accreditation Division is responsible for formulating standards and guidelines for the practice of various forms of TAHC modalities.
Products Division is in-charge with the promotion, marketing, distribution and sales of quality, affordable and conveniently available herbal medicines and other herbal products to customers.