

The PLAMAHS programme



The PLAMAHS programme, a tool for planning and management of assets in health services

Note:

PLAMAHS is currently in phase 2 of development, which is creating a robust and flexible web interface and a variety of facilities to enhance its usability. This brochure is a snapshot of its capability as at September 2010. For further updates, please refer to the HPI website: http://www.healthpartners-int.co.uk/our_expertise/plamahs.htm

1. Introduction

Many countries are in the process of reforming their health systems. This involves a thorough technical and financial evaluation of the system. The resulting reform process often leads to changes in the health package that is supplied by each level of care and as a result in the standard equipment lists and physical infrastructure requirements for health facilities. The PLAMAHS (Planning and Management of Assets in Health Services) programme was originally developed to assist with planning and implementation of this physical assets component (buildings, utilities, and equipment) of health reform processes. Evidence-based planning and management of physical assets requires:

- information on the status of the present asset base through inventory and maintenance information
- a reference to the health and equipment policy in order to assess compliance with the policy
- budgets in order to plan and allocate the available financial resources
- procurement information, supporting the acquisition process of the appropriate equipment.

PLAMAHS provides a platform for handling all this data in a single, integrated system and it can analyze and report on this data. The PLAMAHS database contains 3000 standard equipment records with technical and financial indicators for health care facilities at tertiary, secondary and primary levels in low-income countries. The system can generate inventories of current equipment and compare these against ideal or 'model' equipment levels as well as produce indicative costs of equipping facilities to model levels. This 'equipped according to model' indicator can also be held in history in order to show trends over time. A link with a Geographical Information System (GIS) makes it possible to present all information in the system in a graphical manner on facility and district level. These features make PLAMAHS a powerful tool for ministries of health, other health service providers, donors, health planners and managers. Although originally designed for use within the health sector, PLAMAHS offers enormous potential as a tool for physical assets management in other sectors, such as

education.

2. PLAMAHS' main features

PLAMAHS provides tools for: data-collection, data entry, analysis, querying and reporting of the following main entities:

- general facility data
- equipment inventory
- supporting infrastructure
- buildings.

In addition it can be used to hold information on:

- Definition of standard equipment items, with technical specifications and financial data
- Equipment maintenance, such as jobcards, pro-formas, spare part management and so on
- Definition of model facilities for various levels of care.

It enables users to

- Configure existing facilities according to these model facilities
- Calculate budgets for investment and recurring costs
- Generate bills of quantities, generic specifications and distribution lists
- Monitor maintenance activities of multiple workshops
- Manage relations and documents

The system allows the user to manage the data of any number of facilities and to manage the data of a number of maintenance service providers in a country or region. More recently, PLAMAHS has been linked to the World Health Organization's mapping programme, HealthMapper, which enables PLAMAHS to be used to generate maps using geographically-associated asset data in its system (see Figure 1). These two factors mean that PLAMAHS can be used, for instance, to show which facilities in a country lack access to basic utilities or support infrastructure such as clean water and latrines, and which lack basic equipment or which facilities have the equipment in most urgent need of repair or replacement. Note: HealthMapper is available for WHO member-countries. Potential requests for assistance to this respect will have to come from the WHO member country involved.

3. Other features

System architecture

PLAMAHS has been developed in Microsoft Office Access, as a front-end application: the program (front) and the data (back) are separated. It is designed with the following advantages:

- Reduced network traffic. By installing the program on individual workstations only actual data needs to be sent over the network thus keeping traffic limited.
- Easy system maintenance: program upgrades can be

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implemented without interfering with data.

- The back end (the data) enables easy synchronisation of- data across multiple stand-alone workstations.
- Modular design. Different modules can be installed depending on clients' needs. System requirements, training and costs of implementation are adapted accordingly. (See 'PLAMAHS modules' below.)

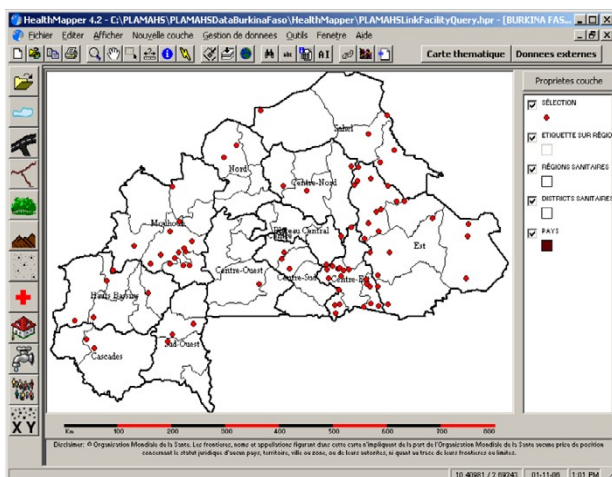


Figure 1. An example of cartographic analysis of PLAMAHS data. This example shows the location of health facilities that were provided with a motorbike for a national immunization programme.

User interface

PLAMAHS is easy to learn and use. It has a:

- Standardised, consistent form layout and colour use in all modules
- Quick navigation
- 'Remember-me' feature: within a session PLAMAHS remembers the last accessed record of most entities, reports and queries
- Whenever possible, data entry is made by selection from pre-defined lists, which can only be edited by authorised users.

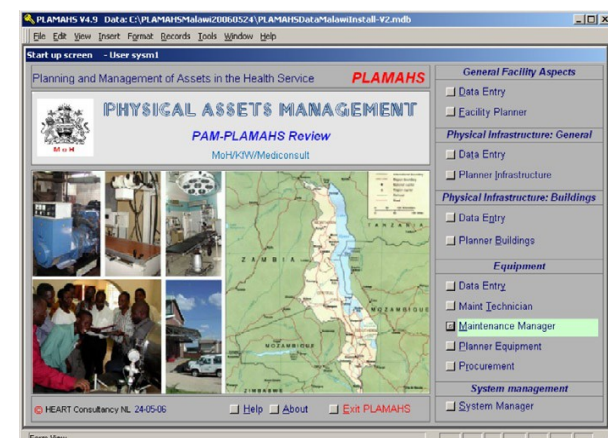


Figure 2: The PLAMAHS start-up form. Based on the logon Username, the security system controls access to the various

modules by enabling respective functions. In this case the user name allows access to modules for the Maintenance Manager function.

Data access and security

- Usernames, passwords, and access rights can be managed by the system manager
- Access rights for viewing and editing data for individual modules can be assigned for each user (see Figure 2 above)
- Recording of username and date after each change in each record makes last data changes traceable to individuals
- Confirmation is required for changes to existing data, preventing unwanted or accidental data changes.

Reporting

There is a standardised reporting form in all modules (see Figure 3 below); up to 150 different kinds of report can be generated. The reports available depend on the module, user group and allocation by the system manager. The standard reporting form provides basic selection criteria. These selection criteria are report-specific.

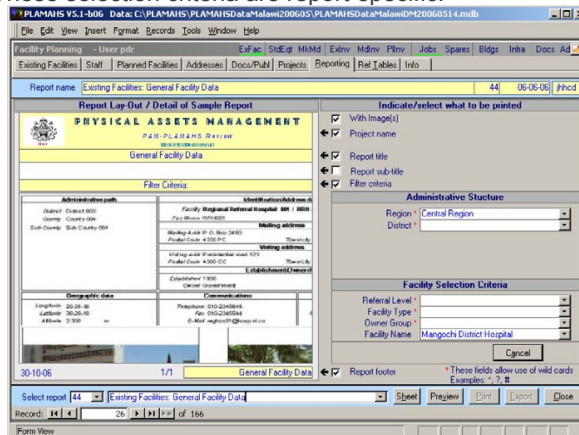


Figure 3: Selecting a report on the universal reporting form. Criteria for reporting are specific for individual reports. Headers and footers can be customised.

Running queries

The standardised, easy-to-use query function is available for all main entities:

- General facility data
- Infrastructure data
- Buildings
- Equipment inventory
- Standard equipment data
- Job cards
- Spare parts
- Model and planned facility inventory
- Addresses
- Documents/publications

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In a query you can specify up to five search terms or criteria (see Figure 4 below)

- Query definitions can be stored under a name that you can specify
- Details of all active queries can be viewed any time

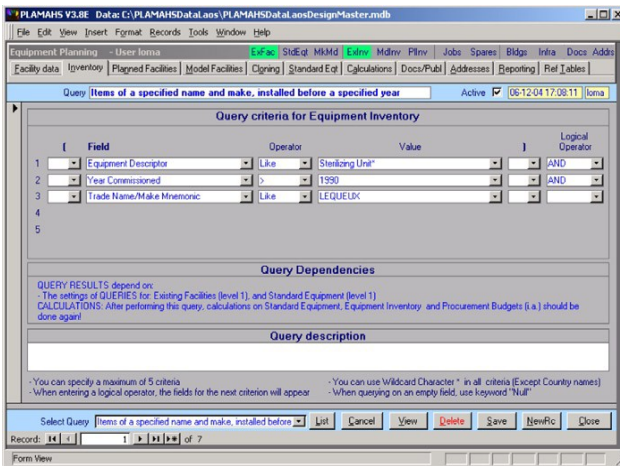


Figure 4: The standardised query form makes querying easy. This example is the form for querying the inventory. Green indicators show active queries.

Country and project-adaptable

Tables can be adapted to reflect the administrative structure of a country (up to a maximum of four administrative levels see Figure 5 below); health system referral structures with local naming conventions (up to a maximum of five referral levels) and definition of tax rates, markets, procurement lots, currencies, country data and so on. In the report generator headings such as project name, logo and report name can be customised.

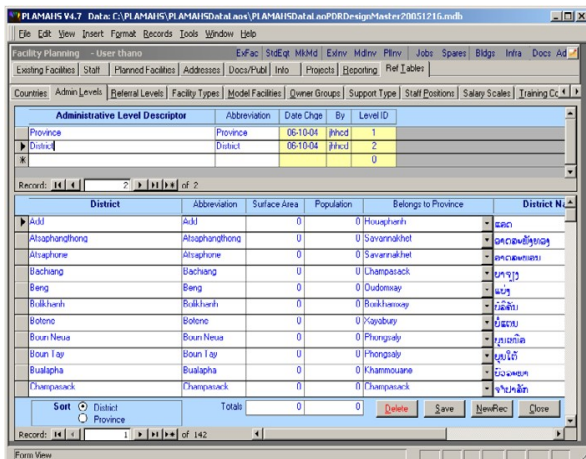


Figure 5: The country structure is defined in reference tables. Up to four levels can be defined.

Decentralised data input support and network

support

PLAMAHS facilitates working at different locations independently. The data can be synchronized (merged) afterwards within a central database that holds information on all locations.
- PLAMAHS is suitable for working in a networked environment.

Customising lists

Customised lists can be created based on a selected query. By selecting the fields required on a list and specifying how the data is sorted, data can be presented as desired. The print function enables immediate printing of a list. With the *Export* function or the standard Windows cut and paste, the list can be copied into Excel or a number of other programs-

Sheet view of all major entities

In sheet view, data is presented in a table-like manner with one line for each record. This puts data in context, enabling viewing of adjacent records, from where records can be selected and then magnified by clicking the form-view button.

Images, graphics and maps

- Images can be linked to all major parts of the system (such as existing facilities, buildings, inventory items, standard equipment, publications). They are shown in a pop-up image frame.
- From the image viewer, the image can be directly opened in a graphics program, enabling editing of the image if required.
- PLAMAHS provides maps of a wide number of countries attached to country data. These maps can be adapted and new maps can be attached. Maps can also be 'pinned up' anywhere on a PC desktop.
- The reporting function offers a choice whether or not to include graphics in reports.

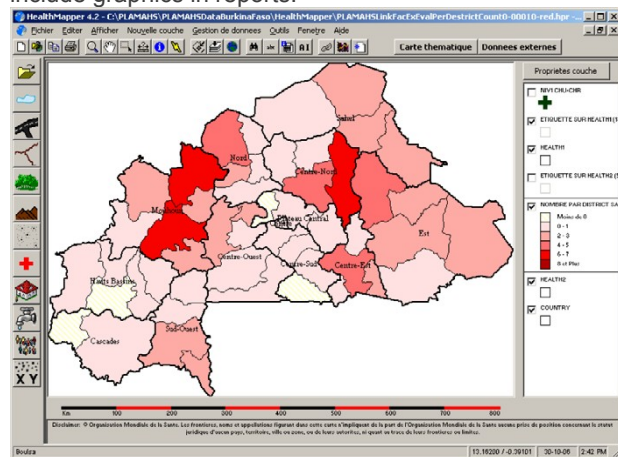


Figure 6: Geographical analysis using WHO HealthMapper. This example counts the facilities per district with a broken-down solar power system (Burkina Faso)

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Geographical analysis of data using the WHO HealthMapper

Analysis of any indicator can be made at different administrative levels, for example by region, province or district, and can be presented on a map. Also facilities can be mapped according to different criteria. Mapping provides a powerful strategic planning tool. The geographical analysis module requires the WHO HealthMapper cartography program. (see Figure 6 above).

Note: HealthMapper is available for WHO member-countries.- Potential requests for assistance to this respect will have to come from the WHO member country involved.

Exporting reports and query results

PLAMAHS interfaces with other applications such as MS Word, Excel and Internet Explorer. Reports and lists can be exported to several formats: rich text format (rtf), text format (txt), spreadsheet format (xls) and internet browser format (html).

Importing existing data

Existing data can be converted to the PLAMAHS format and imported. Data that can currently be imported are: country administrative structures, existing facility data, and equipment inventory data. Where necessary your source data needs to be adapted to the import format. For the other entities, an import function can be created by the system developers.

Multi-language support

The present version of PLAMAHS is in English. A French version is in an advanced stage of development. Translation into other languages can be automated to a large extent by using translation tables and reference tables in the desired language.

As far as support for languages with non-Roman characters is concerned, a version is available with essential fields in Lao Script. Many other languages and other scripts could be created in collaboration with the system developers.

On-line help

A pop-up help-topic facility is available (See Figure 7). Finding topics is possible through Keyword search, Table of content and Topic search. In many cases, the unique Show-me function takes the user right to the required location in the program. Context-sensitive help is provided for a number of activities. Note: the Help function is in development. A range of topics need to be updated or have yet to be added. These will be added to future versions of PLAMAHS.

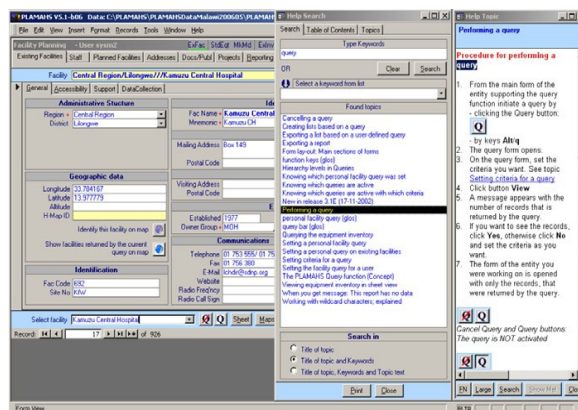


Figure 7: On-line Help with its search and topic forms

4. PLAMAHS modules

The PLAMAHS functions have been grouped into modules that cover a number of major disciplines within the health service. The security system authorises a user to access modules by enabling or disabling the respective buttons on the PLAMAHS Start-up form and displaying or hiding functions within a selected module.

4. 1 General administrative module (facility planning)

- Data entry, querying and reporting on general facility data (name, address data, facility type and so on). See Figure 8 below.
- Definition of the administrative structure of a country (for example, provinces, districts, constituencies)
- Definition of the health system referral structure
- Definition of projects involved in support of the health system
- Reporting for monitoring the process of data entry for all entities: general facility data, infrastructure, buildings and equipment.

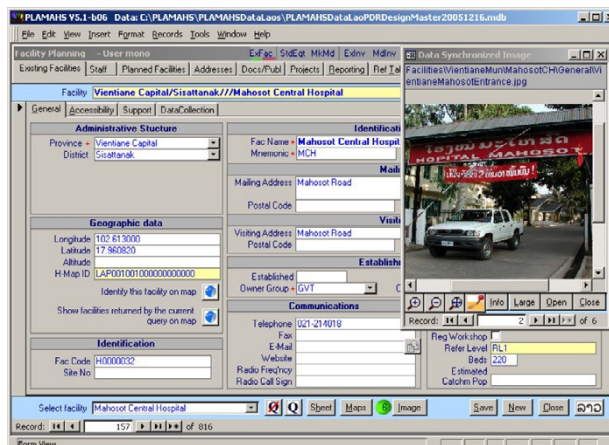


Figure 8: Form for entering general facility data. With image pop-up form

4.2 Physical infrastructure module

- Data entry, querying and reporting on status of buildings and rooms (see Figure 9)
- Analysis of and related reporting on building status and budgeting for rehabilitation of buildings
- Data entry, querying analysis, and reporting on status of supportive infrastructure (water supply, electricity supply, communications, waste management)

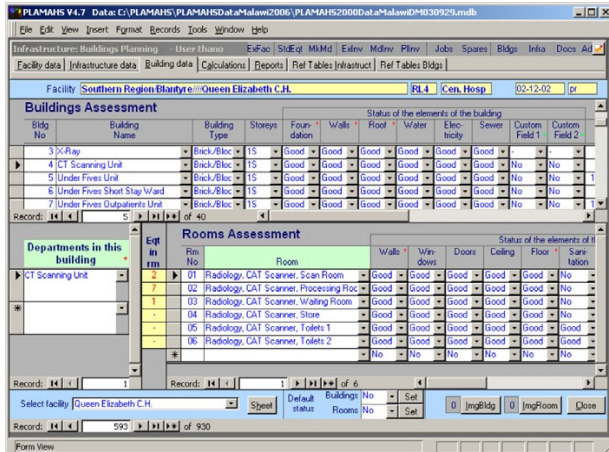


Figure 9: Form for entering building and room data, using the rapid assessment method

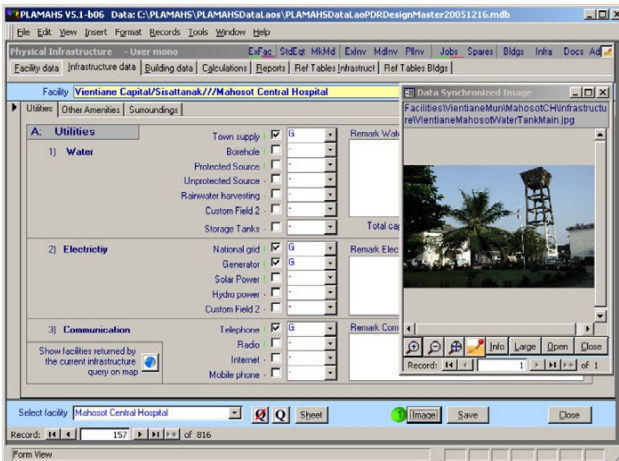


Figure 10: Form for entering physical infrastructure data, using rapid assessment method

4.3 Equipment module

Inventory

- Data entry, querying and reporting on equipment inventory (see Figure 11)
- Statistics and analysis of the equipment inventory, with graphical presentation of the most important inventory statistics

- Clean equipment nomenclature is essential for any inventory system. Through the nomenclature search function equipment can be entered/traced using local nomenclature; however only the agreed correct nomenclature is stored in the database ensuring clean data. Any number of local synonyms can be linked to an official nomenclature term.

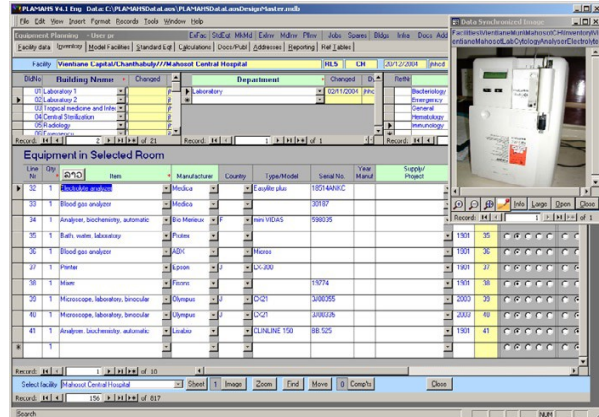


Figure 11: Form for equipment inventory

- Comparison of the equipment inventory with the required standard equipment list for the corresponding facility type, resulting in an 'equipment coverage' indicator
- Storage of statistics for equipment for future reference and trend analysis (see Figure 12)
- Directly link to jobcards (for use if the maintenance module is installed)
- Move function enables moving of equipment from one location to another

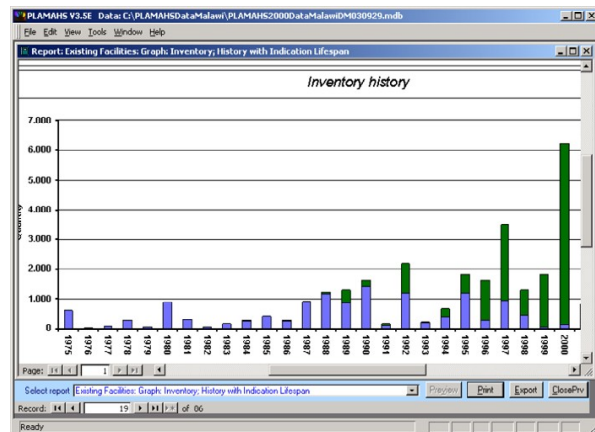


Figure 12: Report with analysis of inventory history. Patterns of equipment procurement can be easily identified

Definition of model facilities and standard equipment

- Definition of national standards for equipping the various health care levels in model facilities (see Figure 13)

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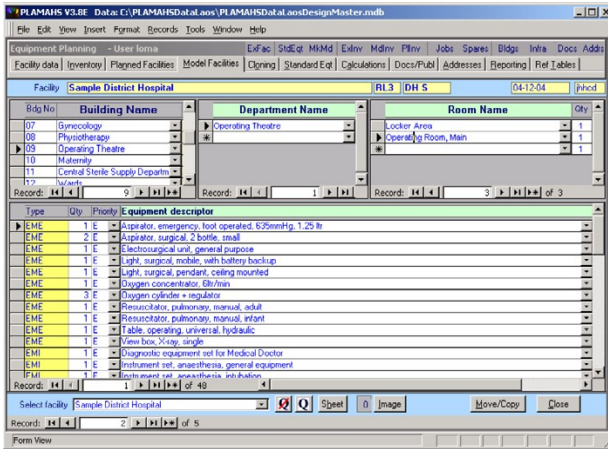


Figure 13: Form for equipping model facilities: the definition of standard equipment lists for each level of care

- Definition of a wide range of features for each standard equipment item such as nomenclature, detailed specifications, sophistication level, financial information and lifespan (see Figure 14)
- Grouping of minor items in sets, which can be referred to as individual equipment items, for example instrument sets and tool kits
- Copying of the standard equipment lists of model facilities to existing facilities (through 'cloning' of the models), followed by fine-tuning of the requirements of each individual facility (up to room level).

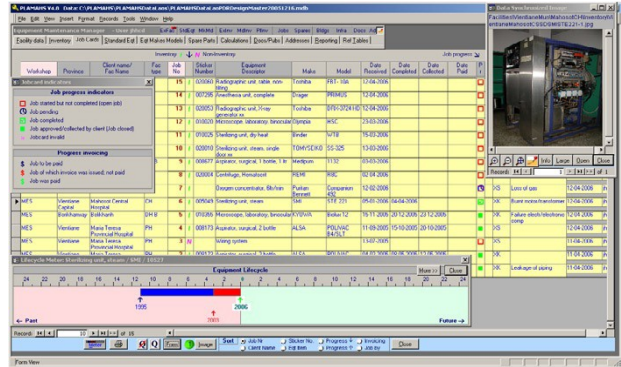


Figure 15: Overview of jobs in a maintenance workshop. The lifecycle meter shows lifecycle milestones of the selected item. The current item is far beyond its lifespan.

- Creation of pro-forma invoices for possible future jobs
- Recording of makes and models of equipment, and price quotes from suppliers
- Management of spare parts, including basic stock keeping for multiple workshops, querying and reporting
- Management of service documentation and attachment of documentation to equipment data
- Quick access to data about manufacturers and suppliers of equipment and spare parts.

Equipment procurement

- Creating procurement budgets for investments and annual recurrent costs (of maintenance, spares and so on)
- Multiple user-definable scenarios enable comparative budget calculations
- All calculations are based on active queries, facilitating extremely flexible budget calculating power
- Provision of financial data in a stable international currency (such as USD or Euro) with conversion to local currency
- Grouping of equipment in procurement lots such as medical equipment, medical furniture, office furniture
- Creation of Bills of Quantities and corresponding procurement specifications
- Generation of distribution lists per facility.

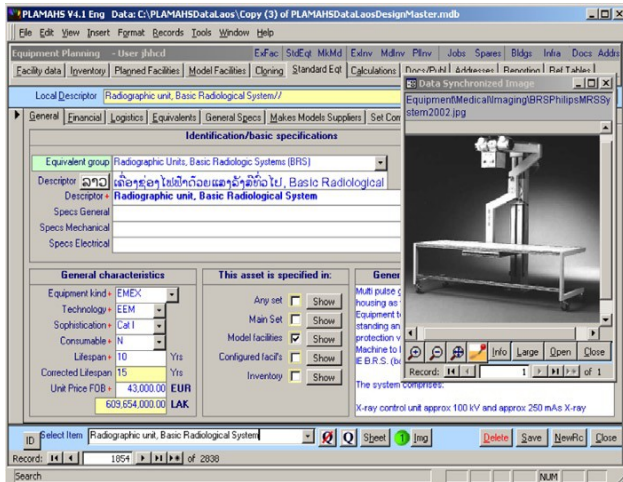


Figure 14: Form for defining standard equipment. The equipment descriptor can be shown in a second language (in this example, Lao script)

Equipment maintenance

- Creation of job cards; querying and reporting on jobs; and retaining job histories (see Figure 15)

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4.4 System manager module

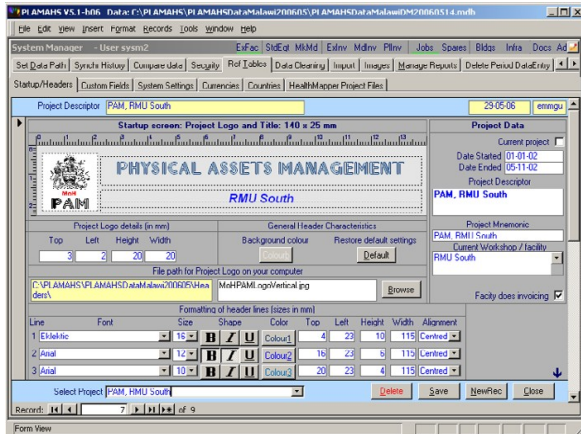


Figure 16: Form for customising the Start-up form and report headers

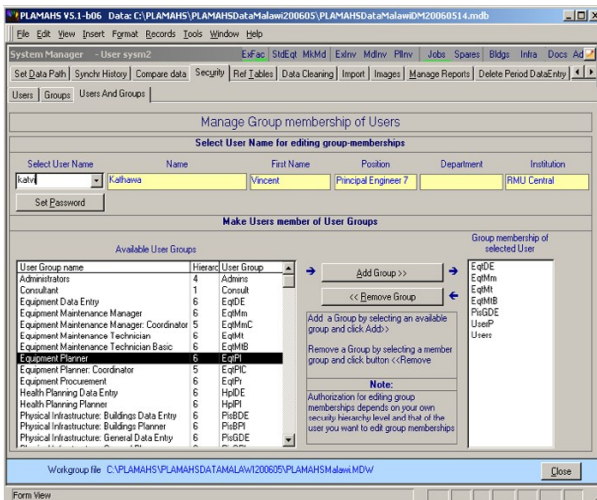


Figure 17: System security module: form for managing access rights for users

- Overview of the synchronisations of the current dataset with the datasets of other workstations
- Management of reports, and authorising availability of reports to individual user groups

- Management of user names, assignment of access rights and allocation of user passwords via a security module. A personal filter can be assigned for access to facility data
- Data cleaning using a quick facility for inventory-wide changing of nomenclature for equipment, departments and rooms, trade-names and so on.
- Customisation of the Start-up screen and report headers (per usergroup, project or individual user)
- Reporting for system diagnostics and bugs
- Comparison of data in the most essential tables of the

current data set with data of another selectable dataset. This helps to identify and rectify data conflicts before

5. System requirements

5.1 System requirements for PLAMAHS: Software

Operating system: PLAMAHS runs under Windows 95, 98, NT, 2000 ME, 2000 Professional, XP Home, XP Professional Vista and Windows 7.

HealthMapper: In case Geographical analysis is needed, the WHO HealthMapper programme and map files of the relevant country are required. The HealthMapper Programme is in the Public domain, but can also be supplied through HEART consultancy. The HealthMapper country - files need to be acquired through WHO.

5.2 System requirements for PLAMAHS: Hardware

Stand alone computer/workstation: (for stand-alone use or workstations linked up to a network server)

Processor:

Recommended 1.5 GHz or higher. Minimum 800 Mhz.

Memory

Recommended: 1G or higher. Minimum 512Mb

Disk space:

PLAMAHS Application: 70-200 MB. (The size of the program file increases due to creation of temporary tables during calculations. Regular compacting is important (a function that can be performed by the system manager). The size of the data file increases when creating replicas and following synchronisation. Regular compacting is important. Actual size will depend on the quantity of data that is entered. When a library of images is used, the size will increase accordingly, depending on quantity and resolution of the images.)

PLAMAHS Data:

Depends on the quantity of data; an absolute minimum of 60MB is required when the database2 is virtually empty. Reserve approximately 200MB for a nationwide database

Image library:

Depends on quantity and quality (resolution) of image files

Document library: Depends on quantity and size of documents

Note:

In *stand-alone* use, the application, data and image and document libraries are all installed on the stand-alone computer.

In the case of an installation on a *network*, the data, image and document libraries are installed on the network server. The application and some auxiliary files

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are installed on the workstations.

Network server (If PLAMAHS is running in a network)
Processor
Recommended 2 GHz or higher. Minimum 1.5 GHz.

Memory:
Minimum 2Gb

For disk requirements of the network server: see specs for Workstation

Monitor:
Recommended : 768 x 1024 pixels. Minimum 600 x 800 pixels. Widescreens (e.g. 800x1280) also supported.

Printer:
Recommended: A4 black and white laser printer and A4 inkjet or laser colour printer

5.3 System requirements of WHO HealthMapper

Programme (version 4.2): Approx 30MB
Country files: depending of the country and the available data supplied in the database, for example: the database for a country like Burkina Faso takes 55MB.

5.4 Miscellaneous additional equipment

Digital camera for images. Approx 3 Mega pixels or more with optical zoom and macro capability
Scanner for digitising existing documents
Back-up medium: CD-ROM R/RW, DVD R/RW, memory stick, tape, etc

6. New features September 2010

6.1 Logistics module for equipment procurement

This module supports acquisition of equipment and subsequent logistics for multiple procurement projects for any number of health facilities. In the logistical process, milestones can be defined which can be traced for complete procurement lots, down to each individual item. At the end of the logistical process, the equipment will be incorporated in the inventory of the facilities concerned as part of the commissioning procedure.

New procurement requirements are based on the planned configuration of a facility, on its current inventory and on all current procurements that are in the pipeline. Through an advanced query mechanism procurements can be created on any category of equipment of any specific facilities.

6.2 Monitoring and evaluation

In many healthcare programmes, quick assessment is done on a regular basis in order to get an overview of the status of some essential services of a health facility. PLAMAHS provides a now a quick assessment tool for infrastructure, buildings and equipment. Essential equipment according to the set equipment standard for a facility can be identified in each individual facility. For this list of tracer equipment an assessment

form is created which can be filled in during the assessment visit in the field. Analysis of the assessment can be done based on the current equipment requirement or based on the requirements at the time that the assessment is taking place. All assessments are kept in an archive which facilitates trend-analysis.

6.3 Profile of a health facility or group of facilities

PLAMAHS provides a form presenting key figures of a health facility or group of facilities thus giving a quick overview of the current overall status of several aspects of the facilities: administrative data, summary data on buildings, infrastructure and equipment. Also it provides an indicator as to what extent the equipment inventory meets the set standard. Thus it is a powerful management tool for health planners and other decision makers. Such overviews can be created per administrative level or any group of facilities and even for a specified group of equipment.

Further information

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