This informational document was written for key decision makers at the Haiti Ministry of Health – after contract award. Their warehouses are operating with paper processes or no processes at all. There is a low level of knowledge regarding modern information systems.

INTRODUCTION TO COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS) AND MANAGEMENT INFORMATION SYSTEMS

A management information system (MIS) is an information system used for decision-making, and for the coordination, control, analysis, and visualization of information in an organization.

Their benefits:

- Improve an organization's operational efficiency
- Help a company improve its business processes and operations.
- **Give an overall picture of the company.**
- Act as a communication and planning tool.
- Cut operating costs!
- Help with decision-making as well as reduce downtime for actionable items.

CMMS are a subset of MIS – they are specifically developed to help maintenance workers do their daily job.

Practical Example, CMMS:

1. Biotechnician receives spare parts from suppliers.
2. Biotechnician stores it in AA21 rack space. He knows where it is, but how will everyone else – his manager, his colleagues know where it is?

Aisle A, Bay A   Aisle A, Bay B
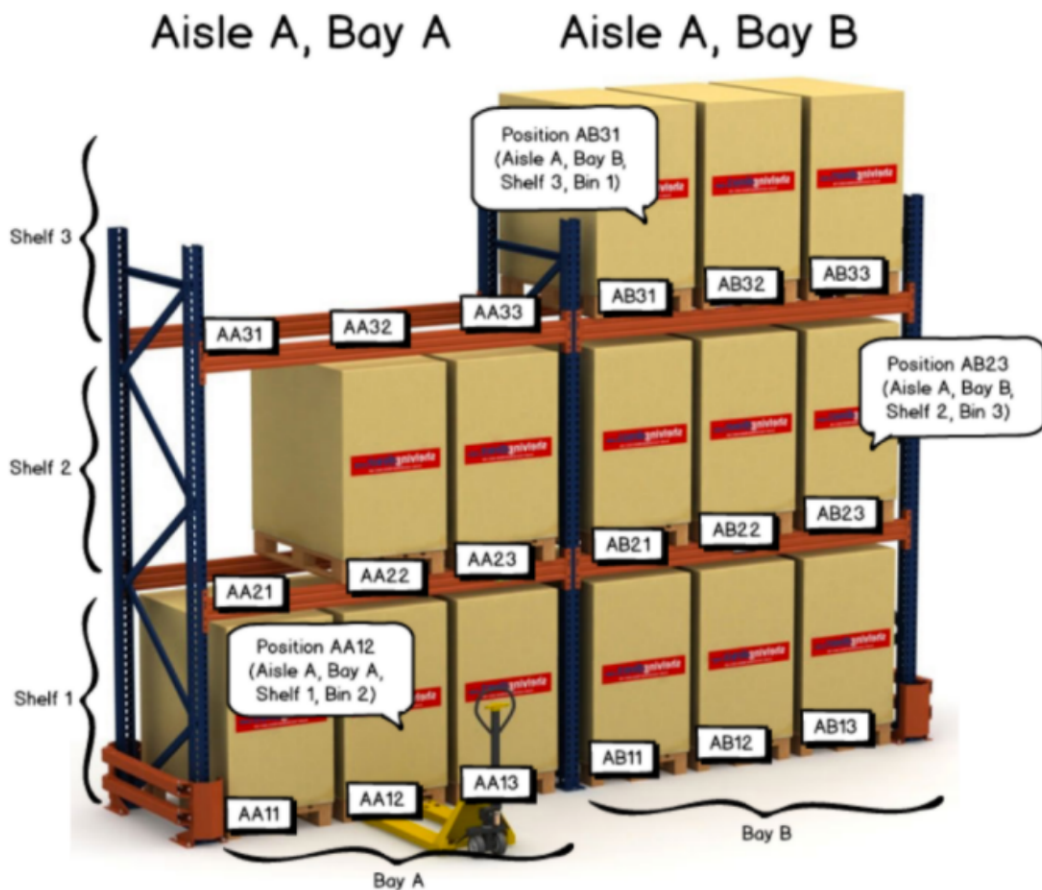
3. Without CMMS: many ways, paper records, post sign at office, post paper sign at rack location, let his colleagues know – but it's not entirely efficient, especially as the organization grows bigger and operates in multiple locations.

4. With a CMMS, can do above, but **ALSO** enter location information in the system.

Stock Location *	warehouse 2
Stock Sub-Location	AA21
Expiry Date *	

5. Anyone with access to the CMMS (and with permissions to see inventory locations and data) can now see that the new equipment is stored at AA21. As long as they have access to the system, they can know this information from anywhere they have access to

the CMMS. They do not have to be physically present at the warehouse to get this information.

If the item moves again from AA21 to another location, that should be reflected in the CMMS. When the item is depleted, again that should be reflected in the CMMS.

This is what is meant by an MIS **giving an overall picture of the company. An MIS contains information that is an abstraction of reality, perhaps even a mirror or "snapshot" of reality – but only if data is accurate and timely.**

The above is just one example – of warehousing and inventory storage. But every important action taken by the biotechnician in his daily duties, can be recorded in the CMMS. Such as: work orders requested and completed, inventory receiving and moving, new parts orders, etc. The CMMS forms a "log" of daily operations, and managers can see this log and make better decisions with this information.

Implementing the system will provide the benefits we listed. But how do we ensure a successful implementation?

Best Practices for IT System Deployments in developing countries

Identify champions and system "owners"

Champions take ultimate responsibility of the success of the project and are usually senior leaders in an organization. They should also act as the ultimate owner of the new system (in this case, the CMMS); or at least delegate that responsibility to a reportee. The champion is an advocate of the new system and has the authority to push it through to his/her employees.

Owners of the system work with the new system on a day to day basis – meaning they look for opportunities to improve the system and have it create value for the organization. They are responsible for improving processes around the new system, monitoring data quality and making sure it matches the business process, and gathering feedback from users. This person should have a management background. They should know the ins and outs of the system and act as the go to person for complex questions about the system, and act as the key person in touch with the software provider.

Assigning responsibility and assembling a steering committee is necessary. Software projects are full of many moving parts! New regulations and procedures, procurement, employee training and the configuration and replication of the software itself - and all of these steps require training too. Projects fall apart without push from internal champions.

Get buy in and commitment from middle management

Middle managers hold the "keys" to data and information and authority to hold others accountable. Without firm cooperation, outside teams do not have legitimacy and power to implement their changes and gather necessary information for a successful implementation. Perks, career advancement and monetary compensation are some external motivators to secure buy-in, but more importantly, it's important to identify middle managers with talent and intrinsic motivation.

Ongoing training and refresher training

New hires should be trained on the use of the system by an existing user of the system. A new biotechnician should be trained by a biotechnician, new manager by existing manager. Refresher training should be carried out at least every two years as a form of re-certification to plug any gaps in knowledge; as the system may be updated or simply, users forget about functions in the system.

Institutionalize CMMS knowledge

Related to the above steps – the "owner" of the system should pass on his knowledge. Guides and manuals should be kept and documented. Others than the system owner should also have deep knowledge of the system. The vendor should be guaranteed as a last resort of key information about the system so that knowledge is not lost if key personnel change.

Gather a list of all assets to be entered in the CMMS

This step has to be done! If key records are already available in electronic format, this can be imported. Otherwise, this can be started with feedback from the vendor or project lead. A system is only as good as the data it contains. For a CMMS this means at least:

- Inventory and equipment data
- Facility data (name, address, phone #)
- Staff data
- Warehousing and Storage information

All of this information and more must be collected and manually typed into a computer, or if it is already available it must be imported into the new system

Document all planned, preventive maintenance procedures

Reactive maintenance costs 3x to 9x more than preventative care. Knowing which piece of equipment needs preventive care and having a scheduling alert system in the CMMS allows organizations to better manage the preventative maintenance process. Catalog the items that need preventative maintenance and then enter that data to reflect that in the system.

Standardize Data Entry Requirements

Work with vendors to build in controls in the data entry that will mitigate different naming schemes. The old saying "garbage in, garbage out" applies. Data quality is a pillar of successful MIS. Define proper permissions – perhaps a single team is responsible for item entry and maintaining all the descriptions and "library" of how items, locations and other data is managed. While end users like biotechnicians simply select the entered items from a drop down list.

Examples of bad data quality include: multiple names for the same item – they need to be consolidated under a single name; misspellings / mistypes (wrong dates for preventative maintenance), inventory counts are wrong; but there are many more possibilities.
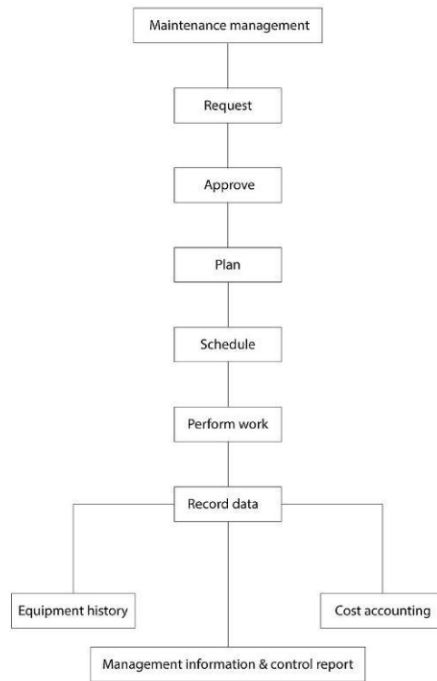
Mobile Access

Ensure that systems are optimized for mobile access. Mobile phones and mobile browsers are much more common in developing country contexts than desktop computers.

Keep Initial Deployments Simple for the End User

A fully featured system can be deployed. However, functionalities should be kept simple and advanced functions should be switched off from the IT administrator side. This will allow an "easing in" of systems allowing the user to familiarize with the system in one or two functions.

Strengthen management, processes and procedures and implement change management to facilitate the implementation of the new system

Users must know how to use the new system. A plan must be made for how the new system will replace or supplement existing procedures and processes. The system must be implemented into the daily operations of an organization. All this is usually supported by a business analyst or project lead that helps analyze an organization's needs and processes. That expert can be an internal staff member or external hire, but someone must guide this process of change management and continuous improvement. What do we mean in practical terms? A practical example:

Maintenance management

Request

Approve

Plan

Schedule

Perform work

Record data

Equipment history

Cost accounting

Management information & control report

A) Paper only process – all repair work is done and recorded on paper forms	B) Process following a successful CMMS implementation
1. Facilities deliver their repair requests to biotechnician supervisor every month 2. Supervisor processes requests for work orders 3. Supervisor assigns work 4. Technician comes to work, picks up work order from supervisor office 5. Technician goes to site facility and repairs equipment 6. Technician fills in form 7. Facility supervisor signs form, validating completed repairs 8. Technician drops off the form at supervisor's office at the end of the day	1. Facilities enter their repair requests into the CMMS as soon as equipment breaks down 2. Supervisor logs into CMMS and processes requests and assigns work in the CMMS 3. Technician logs into their phone and checks their assigned work orders 4. Technician goes straight to the facility and repairs equipment 5. Technician checks off completed in the CMMS 6. Facility supervisor is alerted to validate the repair 7. Technician heads home after work day

Going from A) paper forms to B) CMMS: each manager will need to know a new way of doing things. Each biotechnician will need to learn a new way of doing things and requires the tools and knowledge to do it. This is what change management in the context of CMMS implementation is about: going from an existing process (or no process) and developing and implementing a new, CMMS enabled process. Going from A to B is the art of change management.

And Above all, Patience!

Moving to new systems is a big effort. It takes time and effort from organizations to successfully do this. However, keep at it and the pay off can be very big! A CMMS with accurate data coming in allows better decision making. Historical data allows trends to be plotted, allowing better forecasting and resource allocation. The longer a CMMS is in place, the more you know about the organization. A CMMS can create savings, better efficiency and better service delivery to your beneficiaries.