Pacific Biomedical Network Meeting

What is a CMMS (Computerized Maintenance Management System) and how does it help Vanuatu to manage their medical equipment

Introduction: Andy Lyons

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Fellow, College of Engineers Australia, Biomedical and Electrical Colleges

Member Institute of Hospital Engineers, Australia

Member, Biomedical Engineering Society of the Philippines

Member, Association for Advancement of Medical Instrumentation

Former council member, Society of Medical and Biological Engineers

Former Biomedical Engineering consultant Biomedical Engineering Maintenance Initiative (Cook Is, Tonga, Samoa,)

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Challenges

Prior to 2022, The Vanuatu Ministry of Health had few records of and little control over its medical equipment.

Equipment was mainly provided by donation to individual hospitals or departments and were delivered directly to these areas so no acceptance testing or recording of what actual assets were owned by the Ministry was available.

The biggest task to date of the Biomedical Engineers deployment has been to develop an asset management database, enter all medical equipment onto it and schedule planned maintenance (PM) of equipment in regard to international standards but particularly both manufacturers recommendations and Australian/New Zealand standard 3551.

Why maintain equipment?

The Pacific is a very hard environment for medical equipment.

Equipment often is obtained by donation – either new equipment from aid agency's or from first world users when that equipment is judged end of life in the original setting – this means that generally the equipment is in a poor state and requires **MORE** attention than it normally would in its original setting.

- If medical equipment is to be used to better health outcomes in the Pacific Countries it needs to be **well maintained** to prevent breakdowns that often means the loss of the equipment and any procedure that was reliant upon it and so a scheduled maintenance service is **critical.**

A Typical Computerized Maintenance Management System Program (CMMS).

I have analyzed many systems over the years I have been doing this sort of work and the system I find to be the most practical for the needs of the Vanuatu Ministry of Health is one called FIIX®

I am not recommending this program for you – I suggest you do your research and find a program that suits your needs.

This program suits Vanuatu's needs and so is what I have chosen to use.

For example: we now have over 1800 assets listed and scheduled for maintenance and still have two provincial hospitals to audit and add to that.

From that asset information, including costs, I have been able to identify what is required to be provisioned in the government budget for the next three years to allow the correct maintenance and scheduled part replacement (Batteries, etc.) to meet my KPI's (Key Performance Indicators) of:

- 80% of all medical equipment is available and in service for use by clinicians

and that:

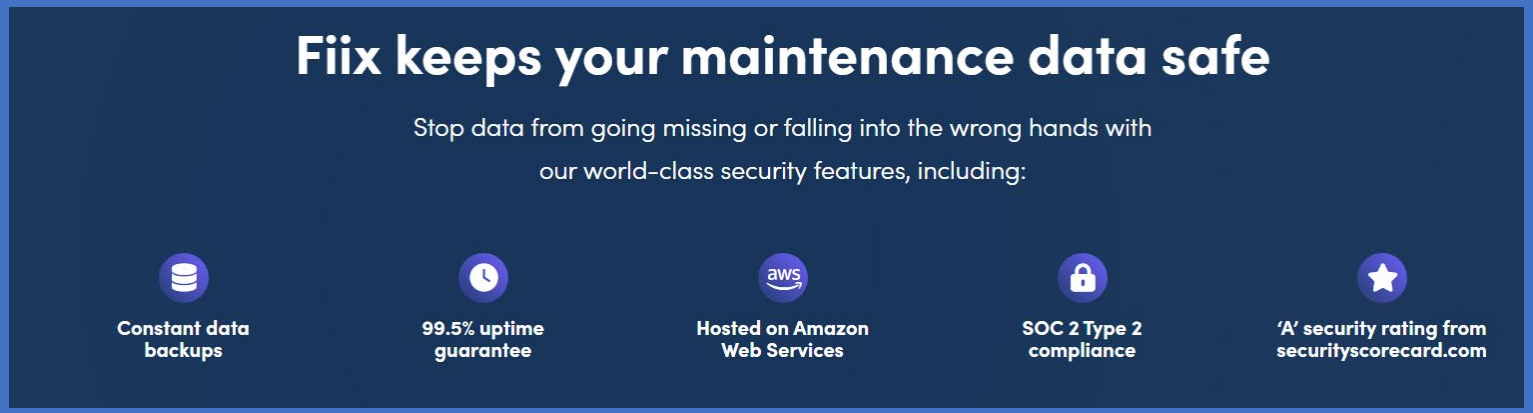
- programmed maintenance is performed within 14 days of a PM work order being generated.

With the ongoing development of the cloud, some data companies have developed online, or cloud-based CMMS programs:

- **These can address a lot of the cost and performance issues experienced by both biomedical departments and other maintenance organisations as well as the issue of offsite/remote access as wherever there is a mobile phone service capable of accessing data the system will work.**

Advantages of a Cloud-Based system

- With a cloud-based system, there are no server nor ongoing IT costs and the loss of service due to unforeseen local circumstances or cyber-attack is eliminated



- There are no annual royalties nor ongoing upgrade costs
- There is no major initial purchase cost

Costs of cloud-based systems

- Access is usually based on a licence per user charge
- For Fiix® this is as low as $45 USD per month!

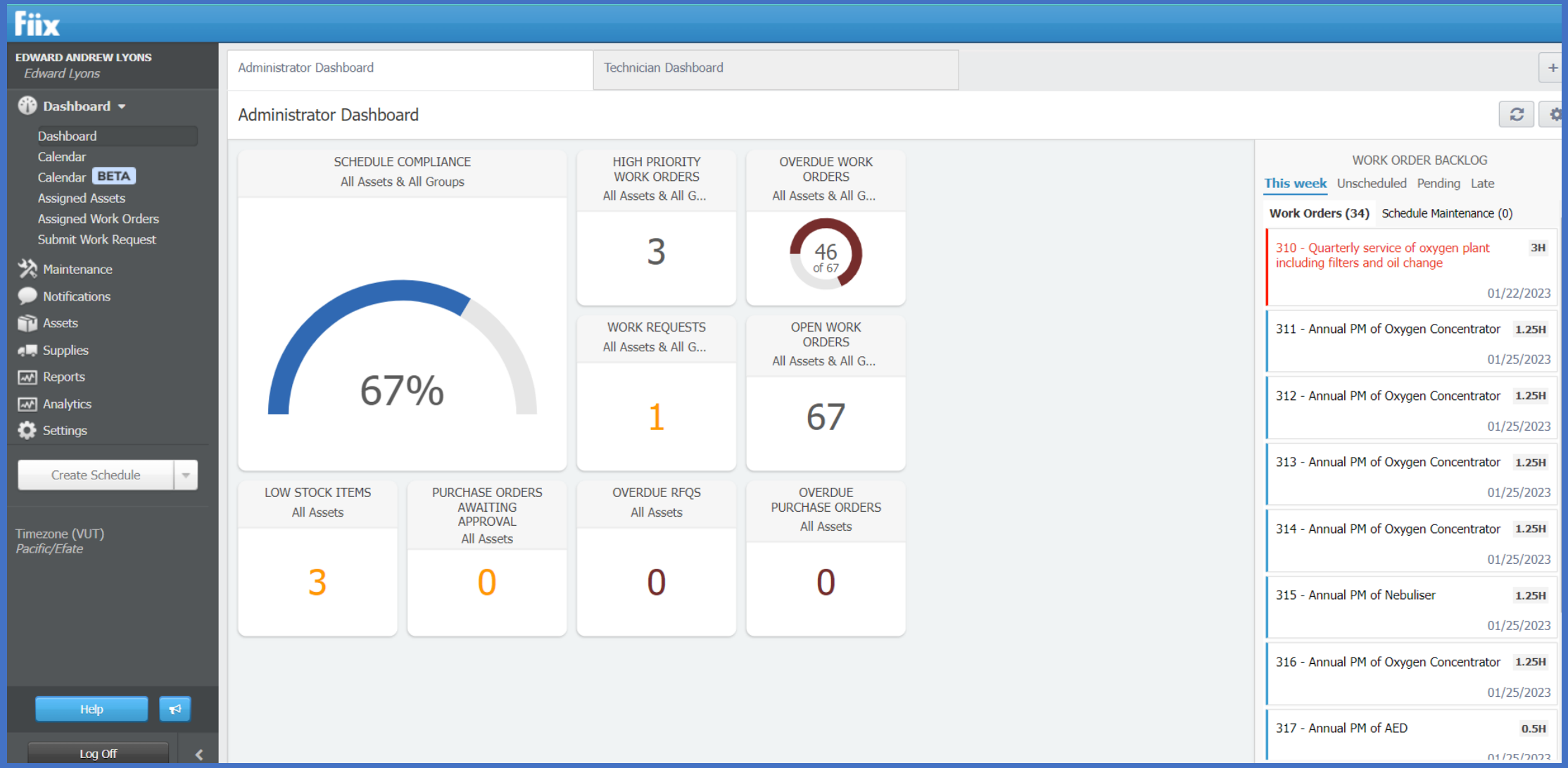
- **For a BME department with five employees (three technicians, a managing engineer and an administration assistant that's a total of $ 2700 per year total cost.**

- There is a more fully featured version for $75 USD per month which has the ability to customise it.

- This cost is more than offset by the cost savings that properly managing your biomedical equipment by regular servicing and maintenance as scheduled and recorded in the CMMS program.
- For example:

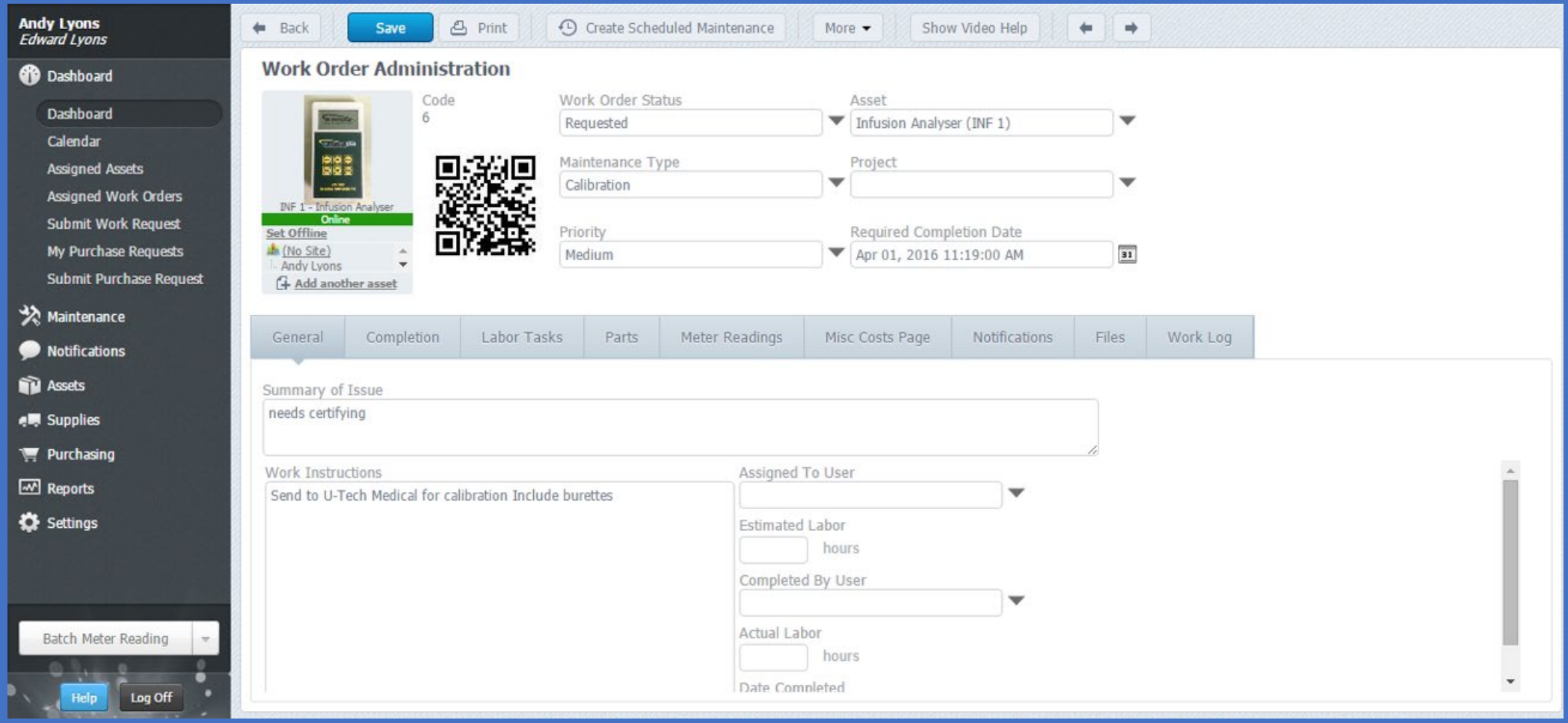
- For an equipment base valued at $1,000,000 Dollars, average yearly maintenance costs are around 10 - 15% ($100,000 - $15,000).
- By performing programmed maintenance at specified intervals, often these costs should drop to 6 – 8% ($60,000 - $80,000).
- This represents a saving of between $40,000 - $70,000 for an outlay of under $3,000. per year!

Looking under the hood…



Components of a Good CMMS System

- A good system should be accessible and simple to use



Scheduling Maintenance

The system allows you to create work procedures for testing assets and will allow you to schedule the maintenance of assets automatically.

At the scheduled time, the system automatically creates a work order with the procedures attached that the technician can complete to finalise the work order and this is recorded against the asset.

The scheduled maintenance work order will also automatically open a repair work order for any asset that fails the maintenance.

Client Generated Repair Requests

- Client generated repair requests can be recorded 2 ways – by the client using the access widgets you can ask IT to place on their home page, or by manual entry of a device that turns up in the workshop.
- Either way a work request is generated which allows steering and tracking of the process

Like all repair requests the client has to be clear as to the fault – not working is never a clear description!

PM Task Recording

PM task recording is set up once – when you receive your first device you can add tasks with descriptions from the service manuals to a group task list. These can include yes or no or text type tasks or readings tasks.

When you create a scheduled work order for a device these tasks are automatically assigned to it

Subsequent devices can be added by just duplicating the first asset and overwriting some details such as purchase details, asset number etc. – by doing this you will automatically have added it to the scheduled maintenance group for that asset type.

Management Functions

Medical equipment, behind facilities and salaries, is typically the third most expensive part of a hospitals budget – as a responsible and competent Biomedical Engineering department, you need to be able to show the costs involved and what is required for the ongoing maintenance and repair of the equipment.

A good CMMS program will have a report generating feature which allows you to show maintenance, repair and financial reporting for every device, ward or clinic and individual biomedical technician.

This information not only demonstrates your are a responsible manager but also helps when it comes to planning and justifying your budget allocation!

Examples of Reports

Examples of reports that can be automatically generated are:

- **An asset report** which lists each asset owned by the Ministry or facility, its age and costs – it can also be broken down to individual areas.
- **A repair and maintenance cost report** – each asset has a unique asset number assigned – each department has a cost code assigned and each technician has an hourly charge rate assigned, from these its easy to generate a report showing how much each individual asset cost to maintain, how much each individual department costs to maintain and what each technician costs.
- These figures can be used for forward budgeting of funding requirements submissions for the department each year.

Biomedical Technician - Using FIIX®

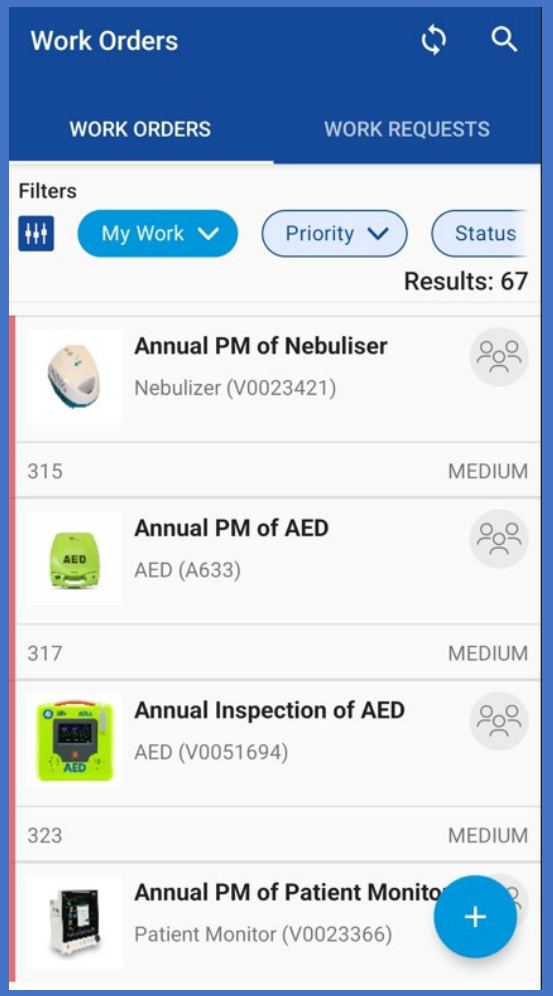
Introduction:

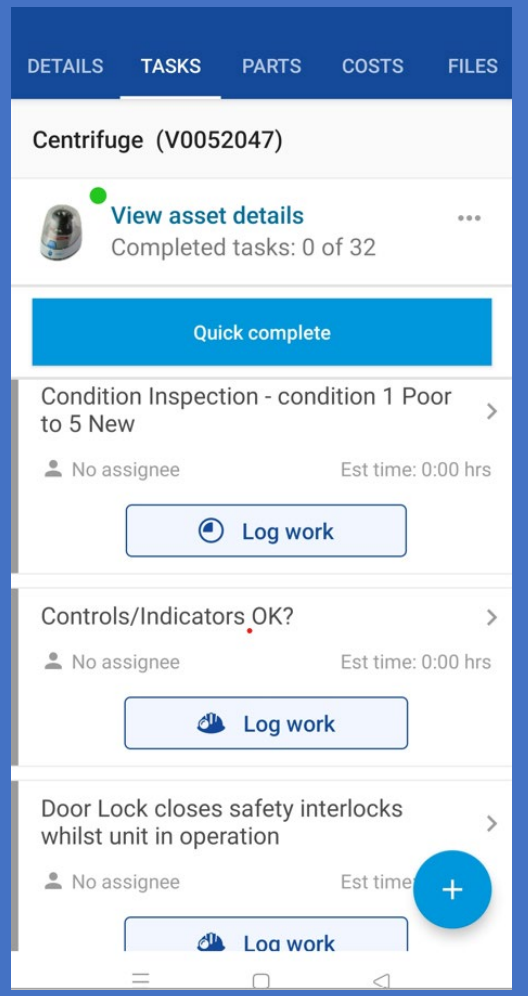
Mrs. Oswald Malisa

- Working as Biomedical Technician for 15 years
- Asset officer for 4 years
- Currently as Biomedical Technician to Northern Provincial Hospital

FIIX® - How and When do use it?

- Once you are given the authority as a Technician then you can Log-in to use.
- I can access it anywhere with network when doing PM and other Service that requires Data entry.
- I receive work orders from administrator.
- I also receive schedule Preventive Maintenance from **FIIX®**
- When working on my Work Orders and PM service and entering of data is complete, then save and close, it automatically move to my closed task dashboard then directly update from the administrators dashboard as well.





FIIX® - What Impact does it have on Biomedical Service

- helps us to keep track on our work thus keep track on our Medical equipment – PM service Monthly, Quarterly and Annually
- Separate a Technician and an Engineer responsibilities.
- Provide update information to our management on tasks done on a weekly, quarterly and annually bases.

Opportunities & Development

In Vanuatu, we are starting from a foundation level – there has been little Biomedical Engineering Input since an AusAid Program called BEMI 2 finished in 2013.

Therefore, it represents a great opportunity to establish a professional BME department with trained Vanuatuan Staff that will serve the Ministry and its hospitals well in coming years.

There is an opportunity to provide both on job, and eventually, a Biomedical Technicians course through the Vanuatu Institute of Technology, which it is hoped will provide Vanuatu and surrounding countries with a team of technicians able to maintain and repair at least 80% of the equipment found within their facilities.

Recommendations

1. Vanuatu establishes a budget line for BME – Current forward planning for each hospital has been completed and budget submissions to maintain and repair equipment at all facilities have been made.
2. Recognition is given to BME as a separate, professional discipline – currently, hospital maintenance staff are being asked to repair sophisticated equipment they have no experience, understanding or training for – as a result most equipment ends up being discarded for minor faults that a competent biomed can easily repair.
3. Relationships with biomedical staff in other countries be encouraged as these relationships will lead to not only the growth and awareness of BME across the region, but its importance in growing the experience of local biomed's and reducing the reliance on expensive overseas consultants and engineers.