

Speaker's Profile



Dr. Phone Suu Khaing

MEAL and Digital Tool Manager

Dr. Phone Suu Khaing is a medical doctor graduated from University of Medicine, Mandalay and has working experience in TB and HIV field for 10 years. She is first year student in Mahidol University for Biomedical and Health Informatics. She has been working as MEAL and Digital Tool Manager under AIS project in The Union organization, providing technical support for VOT applications and End to End Electronic Reporting and Recording system to MMA and MATA organization since April 2022. She worked as project manager for 5 years and monitoring and evaluation manager for 2 years in TB field at The Union, medical officer in ICRC for 1 year and HIV medical officer for 2 year at The Union before current position.

Speaking Topic - Digital platform for VOT and Electronic Remote Monitoring and Reporting

Introduction

The Union is providing technical support to MMA and MATA for developing VOT and E R&R since April 2022 under USAID project fund

VOT

Video technology to remotely observe patient taking medication

Electronic Remote Monitoring and Reporting

Remote monitoring of patient adherence

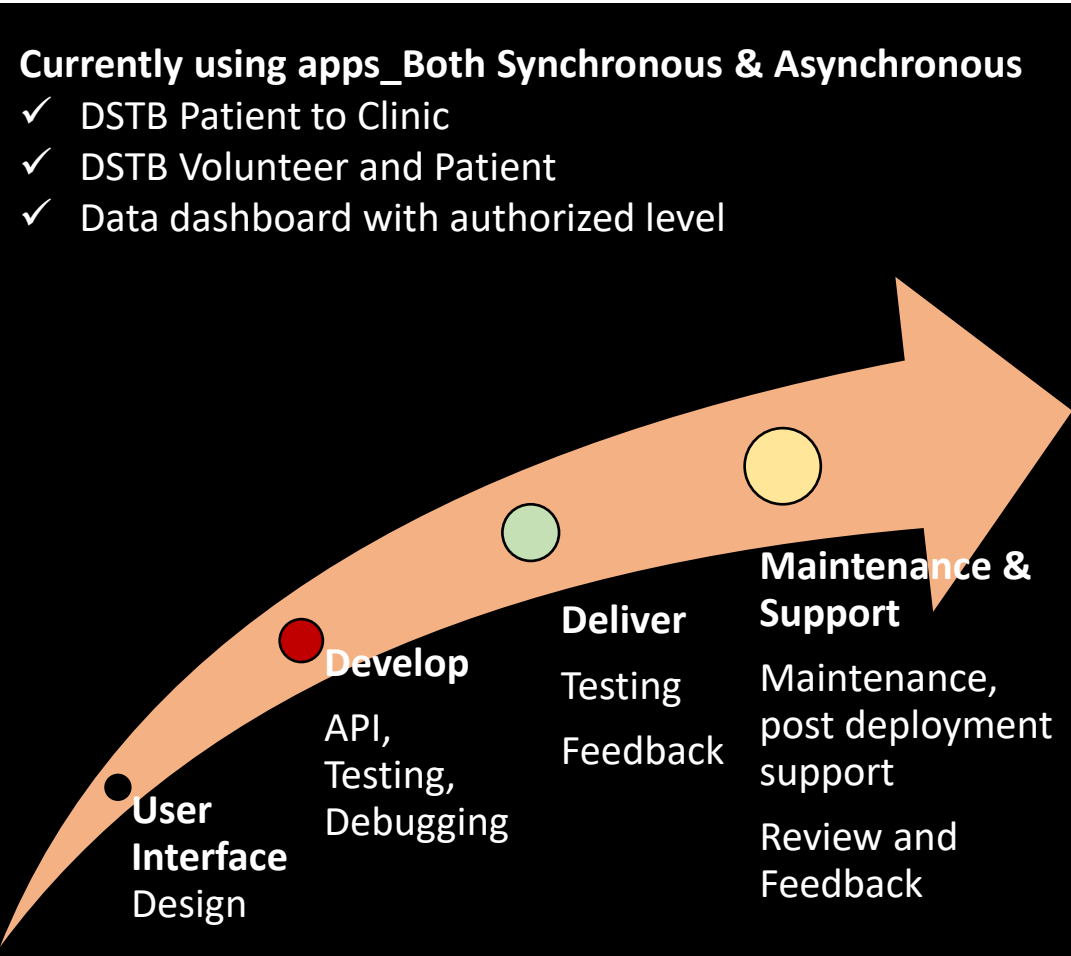
Reporting of treatment progress using electronic system

VOT and Electronic R&R integration

- ✓ Enhanced treatment adherence
- ✓ Accurate monitoring
- ✓ Real time reporting

NSP 2021-2025 National Strategic Direction 5.3.2 → Strengthen electronic-based data management system

Journey of E R&R_MATA



E R&R web app	VOT mobile app
● Recoding – Oct 2022 Programmer changes	● DRTB – June-July 2022 Clone DSTB - Oct 2022
● Oct-Dec 2022	● Oct-Dec 2022
● Dec 2022 to Jan 2023	● Dec 2022 to Jan 2023
● Jan-2023 onwards	● Jan-2023 onwards

**Integration of E R&R and VOT
January 2023 onwards**

- ✓ **Direct Monitoring**
- ✓ **Real time Reporting**

Available reports

- ✓ **Volunteer report**
- ✓ **Facilitator report**
- ✓ **NTP CBTBC report**

Data extract in excel format

- ✓ **Volunteer data**
- ✓ **Patient Data**
- ✓ **Volunteer activity data**
- ✓ **DOT patient data**

<http://mata-vot.org/auth/login>

E R&R and VOT at a glance, MATA

လူနာ၏ကိုယ်ရေးအချက်အလက်များကို ဦးစားပေး
လျှို့ဝှက်ချက်အနေဖြင့်(သက်ဆိုင်သူမှအပ အပြင်သို့မ
ပေါက်ကြားအောင်) ထိန်းသိမ်းထားပါသည်။

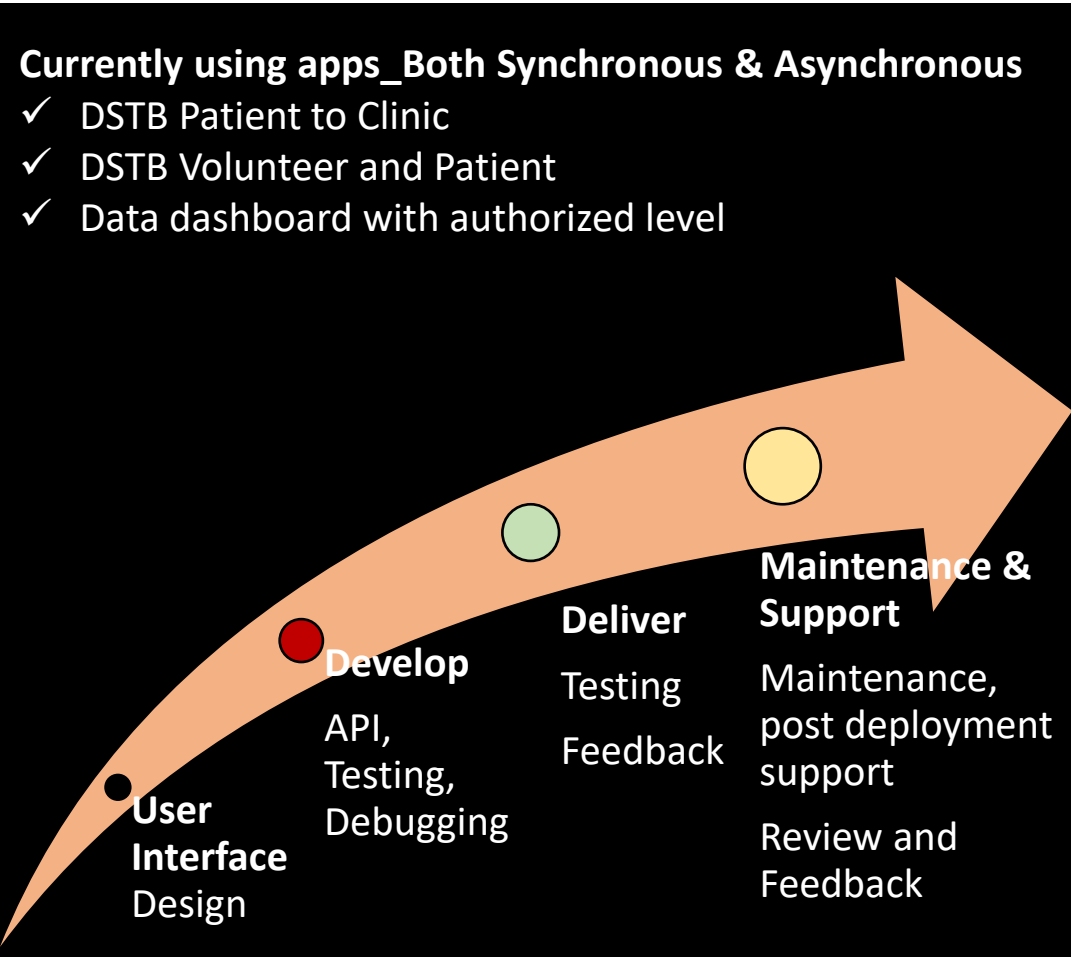
MATA VOT DOT

Code

Password

Login

Journey of E R&R_MMA

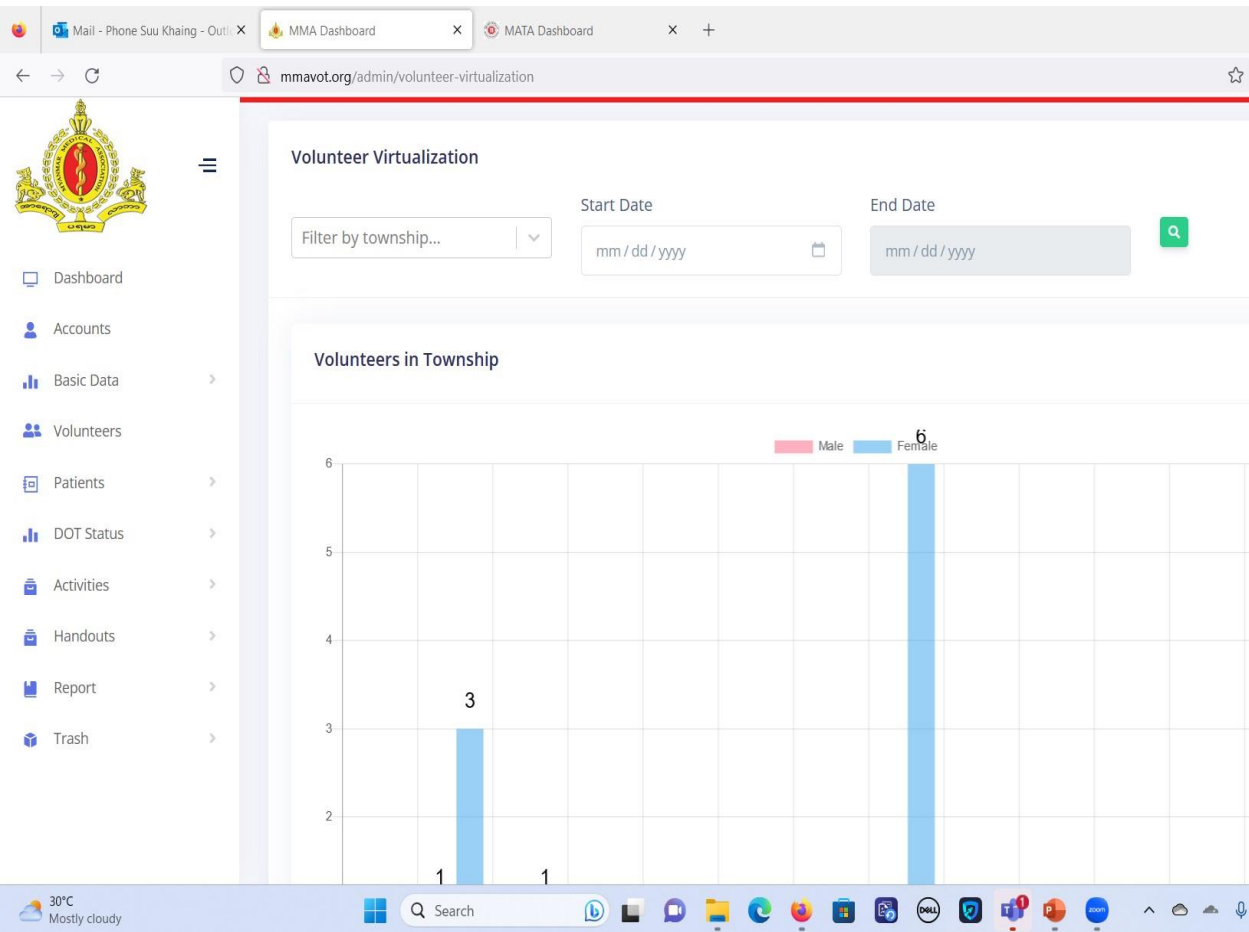


E R&R web app	VOT mobile app
<ul style="list-style-type: none"> ● DRTB – June-July 2022 Clone DSTB - Oct 2022 	<ul style="list-style-type: none"> ● DRTB – June-July 2022 Clone DSTB - Oct 2022
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- Integration of E R&R and VOT
January 2023 onwards**
- ✓ **Direct Monitoring**
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- ✓ **Volunteer report**
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 - ✓ **AIS report**
- Data extract in excel format**
- ✓ **Volunteer data**
 - ✓ **Patient Data**
 - ✓ **Volunteer activity data**
 - ✓ **DOT patient data**

<http://mmavot.org/auth/login>

E R&R and VOT at a glance, MMA



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VOT Volunteer_MMA_DS

Code
MB0001

Password
1454

Loading

The Union

လူနာစာရင်း

ကြီးကြပ်ရေးမှူးသို့ ပို့ပြီးစာရင်း

ကြီးကြပ်ရေးမှူးသို့ ပို့ရန်ကျန်သောစာရင်း

တံဘီးဆေးရုံမှစာရင်း

စေတနာ့ဝန်ထမ်းလုပ်ဆောင်ချက်များ

လပြည့်သလိပ်စစ်ဆေးရမည့်လူနာစာရင်း

စေတနာ့ဝန်ထမ်း လက်ဖွဲ့လမ်းညွှန်စာအုပ်

Real time data on data dashboard

Dot Visit Date (app)

Patient Name - [REDACTED]

TB Code - 23/160

Current assign volunteer - [REDACTED]

[New](#) [Export](#) [Dates Clear](#)

အောင်မြင်သည့်အရေအတွက် - 8
မအောင်မြင်သည့်အရေအတွက် - 12
မသွားရသေးသည့် ရက်စုစုပေါင်း - 0

ID	Date	Status	Volunteer
1	2023-04-22	not visited	
2	2023-04-23(07:43 AM)	complete	[REDACTED]
3	2023-04-24	not visited	
4	2023-04-25	not visited	
5	2023-04-26	not visited	
6	2023-05-09(10:11 PM)	complete	[REDACTED]
7	2023-05-10(05:17 AM)	complete	[REDACTED]
8	2023-05-11(06:51 AM)	complete	[REDACTED]
9	2023-05-16	not visited	

User Data up to now

MMA Dashboard and VOT app	Number of user
Dashboard	9
VOT (Patient to Clinic)	2 Male & 2 Female
VOT (Volunteer and Patient)	2 Male & 1 Female

MATA Dashboard and VOT app	Number of user
Dashboard	13
VOT (Patient to Clinic)	1 Female
VOT (Volunteer and Patient)	1 Female

Cost per month

E R&R at Digital Ocean

- ✓ Frontend (UI) – 4 \$/ month
 - ✓ Backend – 6 \$/ month
- } Hosting fees
- ✓ Data back up – 15 \$/month (For data security and confidentiality)
 - ✓ File storage for non-text variables (e.g image, handout, excel file etc) – 5 \$/ month

VOT at Agora and Amazon Web Service (AWS)

Video call service – 0 \$ up to 10,000 minute/ month, 3.99 \$ per 1,000 minute if > 10,000 min/ month

Video call data backup – 0 \$ until 50 TB, 0.023 \$ x 1 GB will be collected after 50 TB (Fees for 50 TB will be added)

Currently – 30 \$/month for E R&R, 0 \$ per month for Video call service at Agora and Video call data backup at AWS

Challenges on developing apps

- ✓ The first server was Digital Ocean for both VOT and E R&R.
- ✓ Digital Ocean did not support Video function well and needed to change to another server, Agora.
- ✓ Video call function is well supported by Agora and data backup by cloud saving is well supported by Amazon Web Service.
- ✓ Without data backup in respective server, data loss when being hacked (Lesson learnt in November 2022)
- ✓ Still working hard to be uploaded in Google playstore due to Google privacy policy
- ✓ Higher cost to be uploaded in IOS App Store due to high developer account fees (99 \$/year) Vs 25 \$/lifetime for unlimited apps
- ✓ Demanding lower Android version below 8.0 for VOT
- ✓ Laptop_Window 8, Tablet_Android version 8.0 is minimum requirement for dashboard web applications
- ✓ Not feasible to provide customized request which is ringtone notification like normal phone call, both volunteer and patient needs to enter respective app at the same time like Zoom app

Challenges on implementation

- ✓ Mobile handset with android version 8.0 above
- ✓ 4G internet for video call function
- ✓ Digital literacy is essential
- ✓ Resistance to change traditional to E R&R even in supervisor level
- ✓ No specific VOT criteria and guideline yet for patients and volunteers

Reason for inconvenience to use VOT app_MMA (10.5.2023)		
No	Category	Count
1	Outcome (move to 2nd line, refer to hospital, died)	7 (16%)
2	Under 18 years (VOT criteria)	8 (18%)
3	No phone, key-pad phone, I phone and damage phone	14 (32%)
4	Not matching Android version	12 (27%)
5	Internet connection problem	1 (2%)
6	Deny VOT (Office Staff taking medication at office hour,	2 (4%)
	Total	44

No	Inconvenience factors related to VOT app	Cause	Troubleshooting
1	Rotation of the camera (screen layout view) in some users	Application	Users need to exit the app and reenter. We are working to help this error.
2	Need VPN before opening VOT app with mobile data (it's ok with Wi-Fi)	Unknown	It is not application error and thus no specific solution
3	The screen change to black or orange during video call session between volunteer and patient	Due to connection problem	It is not application error and thus no specific solution

Future Plan

- ✓ Feedback response channel via pop up message in VOT app
- ✓ Transforming https from http for web address for better security
- ✓ Both E R&R and VOT will be transferred to AWS server
- ✓ TOT training
- ✓ User guidance video to be added in all app
- ✓ Data visualization in data dashboard
- ✓ Hand-over of video call function in currently using DAT app in The Union Project
- ✓ Research on E R&R and VOT

Photo Session_TOT at MATA



Case Study on VOT_Adherence and Cost

Video-observed therapy and medication adherence for tuberculosis patients: randomized controlled trial in Moldova

VOT significantly decreased nonadherence by 4 days (95% CI 3.35-4.67 days, $p < 0.01$) per 2-week period

5.24 days missed per 2-week period for DOT and 1.29 days for VOT

VOT patients spent MDL 504 (~EUR 25) (95% CI MDL 277–730, $p < 0.01$) and 58 h (95% CI 48–68 h, $p < 0.01$) less on their treatment.

<https://erj.ersjournals.com/content/56/2/2000493.long>

Video directly observed therapy for supporting and monitoring adherence to tuberculosis treatment in Uganda: a pilot cohort study

Of 52 patients enrolled, 50 were analysed. 28 (56%) were male, the mean age was 31 years (range 19-50 years) and 35 (70%) owned smartphones. Of the 5150 videos expected, 4231 (82.2%) were received.

Phone malfunction, uncharged battery and VDOT app malfunctions were the commonest reasons for missed videos.

92% of patients reported being very satisfied with using VDOT

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7132038/>

Case Study on VOT_Perception

Perceptions and Acceptability of Digital Interventions Among Tuberculosis Patients in Cambodia: Qualitative Study of Video-Based Directly Observed Therapy

Familiarity with mobile technology and apps was widespread in this population, and overall willingness to consider a mobile app for video-based directly observed therapy was high

Potential challenges were as follow.

First, patients very much valued their frequent in-person interactions with their health care provider, which may be reduced with the video-based directly observed therapy intervention.

Second, there may be technical issues to address, including how to make the app suitable for illiterate participants.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7418013/?report=reader>

Stakeholders' Perceptions of Benefits of and Barriers to Using Video-Observed Treatment for Monitoring Patients With Tuberculosis in Uganda: Exploratory Qualitative Study

Perceived benefits of VDOT were facilitation of easy adherence monitoring, timely follow-up on missed doses, patient-provider communication, and saving time and money because of minimal travel to meet in person.

Perceived barriers included limited technology usability skills, inadequate cellular connectivity, internet access, availability of electricity, cost of the smartphone, and use of the internet. Some female patients raised concerns about the disruption of their domestic work routines to record videos.

The impact of VDOT on privacy and confidentiality emerged as both a perceived benefit and barrier.

<https://pubmed.ncbi.nlm.nih.gov/34704961/>

Case Study on VOT_Usability

A Comprehensive App That Improves Tuberculosis Treatment Management Through Video-Observed Therapy: Usability Study

This study included 158 patients in the retrospective DOT group and 235 patients in the VOT group.

The VOT group showed a significantly higher fraction of doses observed ($P < .001$), less missed observed doses ($P < .001$), and fewer treatment discontinuations ($P < .05$) than the DOT group.

Over 79.1% (186/235) of the VOT patients had >85% of their doses observed, while only 16.4% (26/158) of the DOT patients had >85% of their doses observed.

All patients were cured without recurrences.

The VOT management required significantly ($P < .001$) less median patient time (300 minutes vs 1240 minutes, respectively) and transportation costs (¥53 [US \$7.57] vs ¥276 [US \$39.43], respectively; $P < .001$) than DOT.

Significantly more patients (191/235, 81.3%) in the VOT group preferred their treatment method compared to those on DOT (37/131, 28.2%) ($P < .001$), and 92% (61/66) of the health care workers thought that the VOT method was more convenient than DOT for managing patients with TB.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7428914/>

Factors contributing future possibility of DAT through VOT

Accessibility: Eliminate geographical barriers

Convenience: Flexibility in term of scheduling and reduce the need to travel for in-person therapy session which is time consuming

Anonymity and reduced stigma: Provides certain level of anonymity

Continuity of care: allows for consistent and uninterrupted therapy sessions during crisis, natural disasters or pandemics

Specialized services: Individuals can connect with expert therapists from different region or country

Cost-effectiveness: No travel expenses and reduces overhead costs for therapist with more affordable options



HIV/TB Agency, Information and Services Activity

THANK YOU.