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Optimising MRI Utilisation Across 6 Centres – A SingHealth Cluster Approach



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Introduction

Magnetic Resonance Imaging (MRI) machines are expensive assets heavily utilised in the modern practice of medicine and surgery to guide patient care. MRI data is also valuable in medical, research and education. As the demand for MRI services is expected to grow, it is prudent for the cluster to evaluate and optimise machine utilisation rates before considering the acquisition of new machines.

Objectives

A cluster-level MRI Workgroup was therefore formed with the following objectives:

- ☐ Monitor utilisation across 16 MRI machines in 6 centres
- ☐ Find ways to optimise MRI machine utilisation

Methodology

The Workgroup evaluated various options to measure MRI utilisation. These included the use of RFID technology, vendor machine utilisation tracking services, report generation from Radiology Information Systems, as well as the use of a free mobile Timesheet application.

After a cost-benefit analysis, the Workgroup agreed on the use of the Timesheet application on a tablet as it had the following advantages:

- ✓ Low cost
- ✓ Easy-to-use features
- ✓ Easy-to-implement
- ✓ Enabled tracking of actual uptime of MRI

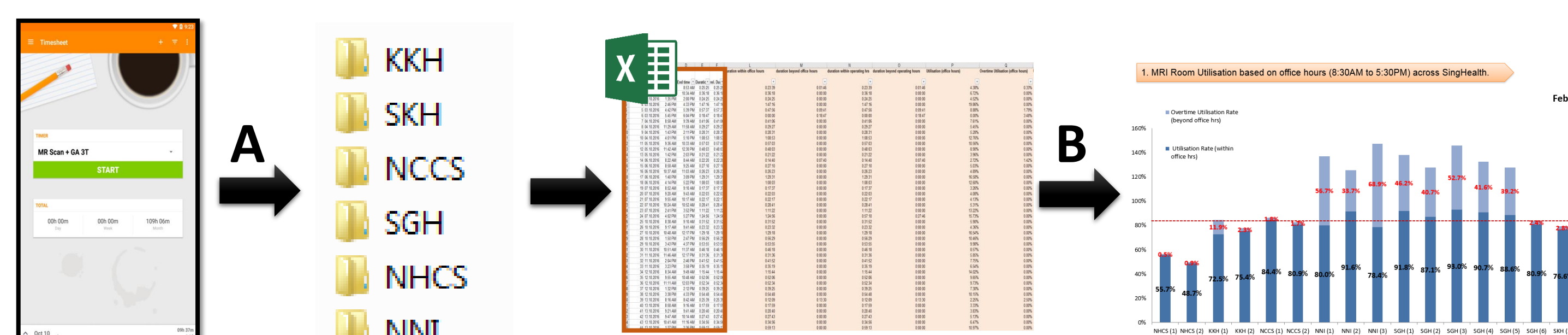


Figure 1. (A) Transferring captured data from Timesheet to common data repository; (B) Translating data into MRI utilisation dashboard using excel template

1. Tracking of actual uptime of MRI Room Utilisation by Timesheet app on a tablet
 - Radiographers tap-in (start) and tap-out (stop) on the tablet as a patient enters and exits the MRI Room
2. Users with access rights upload monthly raw data to a common data repository
3. Raw data is exported to an excel template to auto-generate the monthly MRI Utilisation Dashboard for the 16 machines across SingHealth

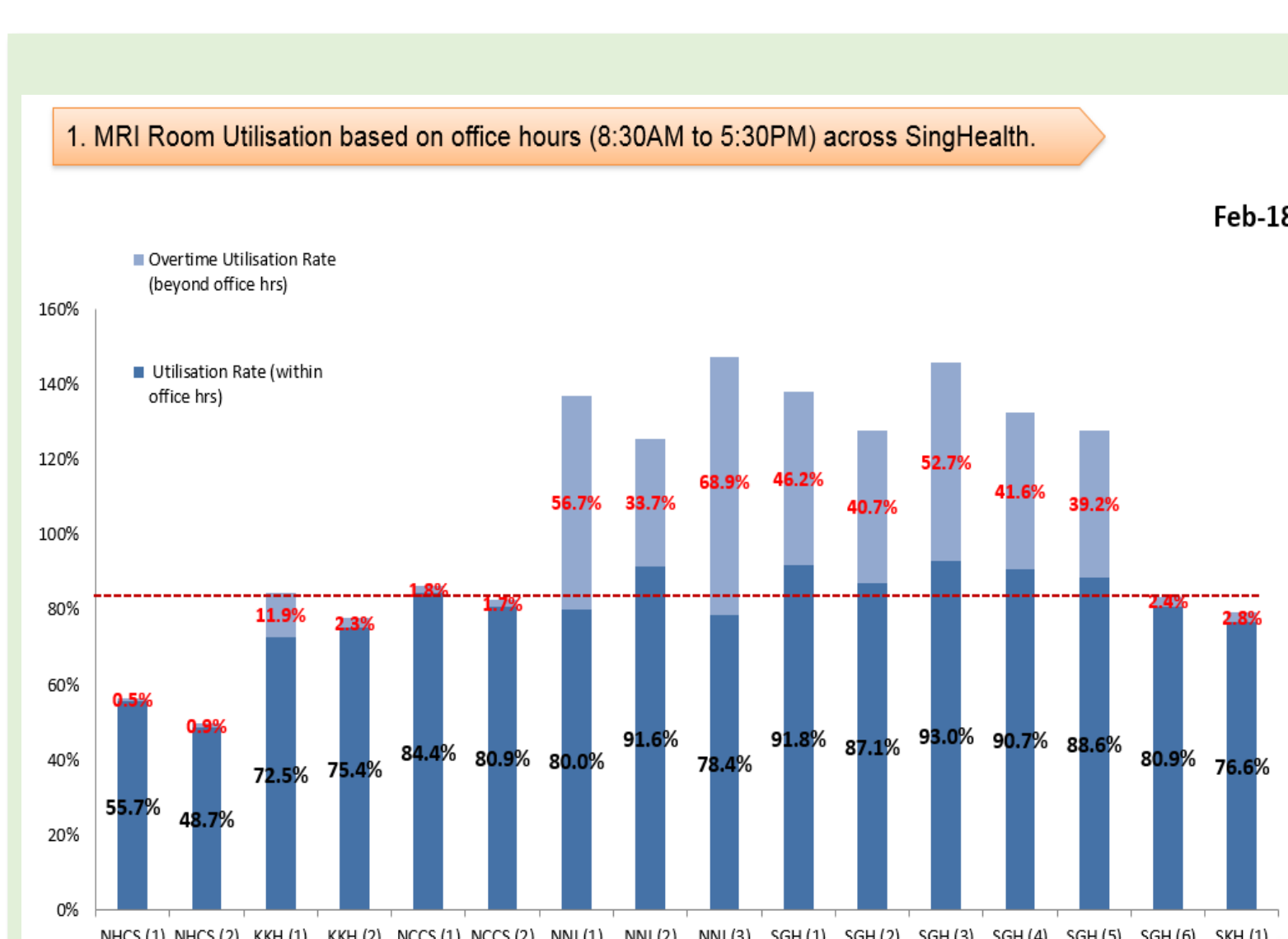


Figure 2. Sample of The MRI Utilisation Dashboard showing utilisation rates based on office hours (8.30AM to 5.30PM) for the 16 MRI machines across SingHealth

The MRI Utilisation Dashboard:

- ✓ Allows each centre to view and monitor their MRI utilisation (during and after office hours, during and after operational hours as well as idle times)
- ✓ Provides relevant data to support each centre in the identification of opportunities for optimisation of MRI resources

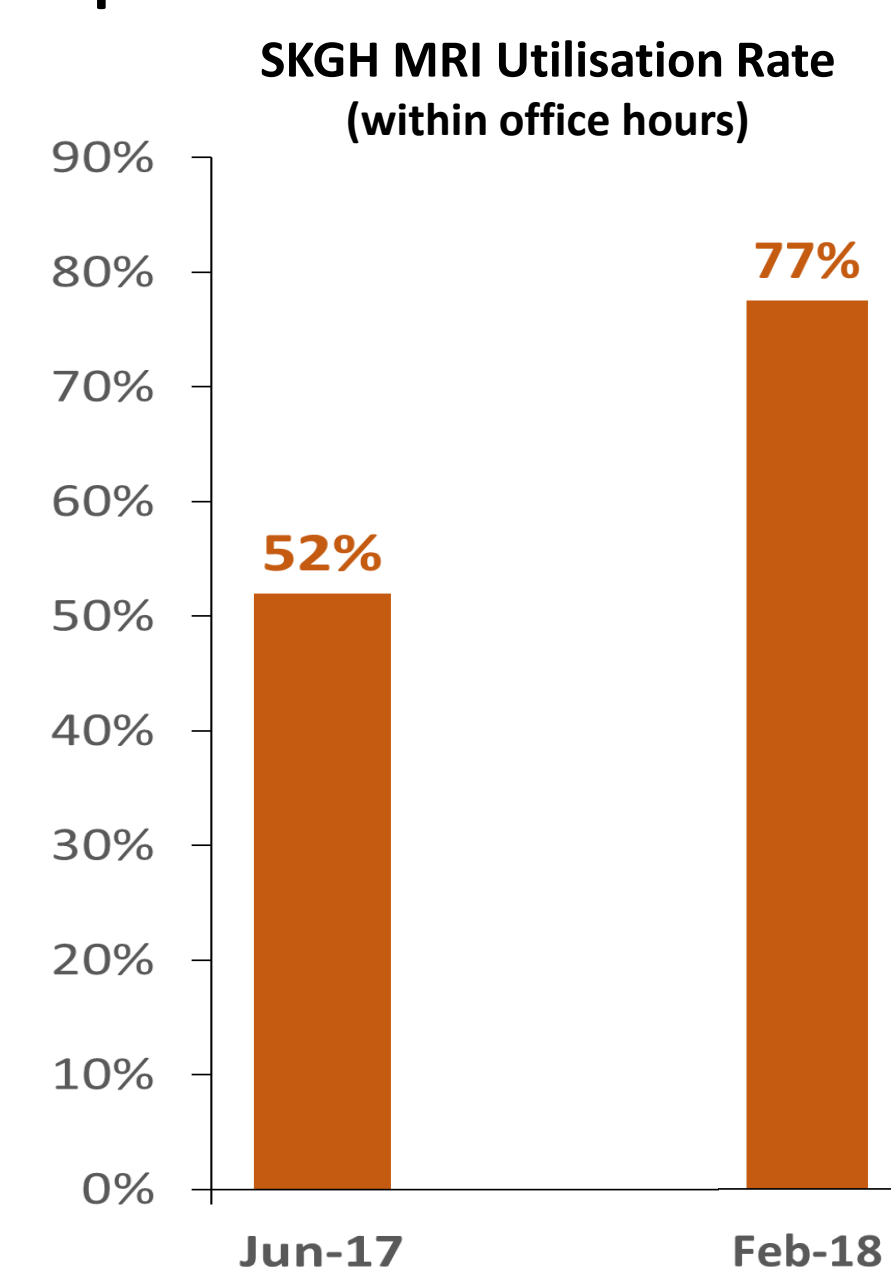
Results

Since the use of the MRI Utilisation Dashboard from June 2017, the overall MRI utilisation within SingHealth cluster has improved.

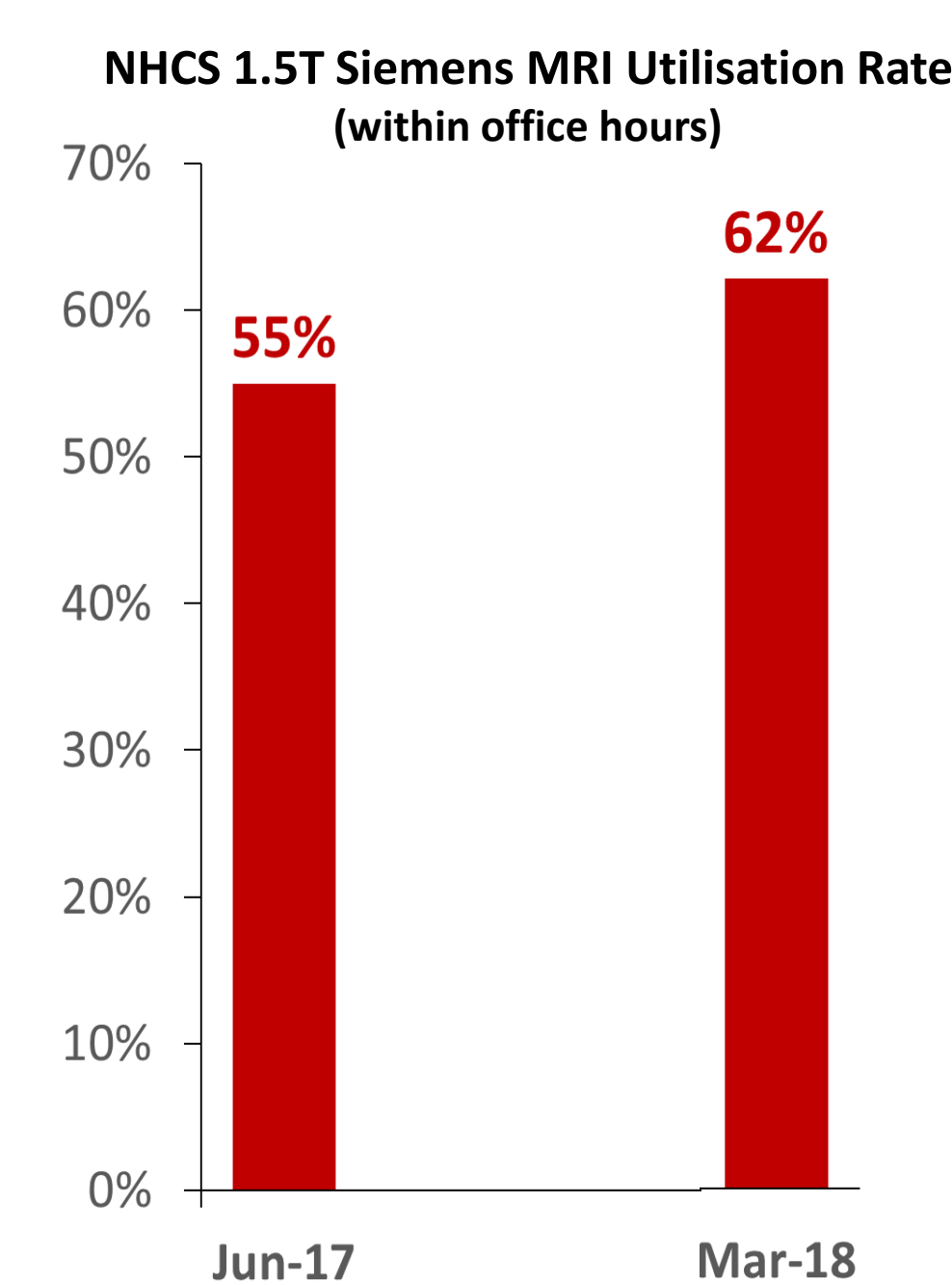
Utilisation Rates	No of Machines (out of the 16 MRI machines)	
	June 2017	March 2018
>85%	25% (n = 4)	50% (n = 8)
80% - 85%	6.3% (n = 1)	25% (n = 4)
75% - 80%	37.5% (n = 6)	12.5% (n = 2)
70% - 75%	6.3% (n = 1)	0% (n = 0)
<70%	25% (n = 4)	12.5% (n = 2)

One opportunity identified to optimise MRI resource is the potential for **cross-centre engagement for load-leveiling**. Cross-utilisation within SingHealth started with referrals from Singapore General Hospital (SGH) to Sengkang General Hospital (SKGH) and National Heart Centre Singapore (NHCS).

In addition to organic growth, cross-referrals also accounted for improvements in MRI utilisation rates in SKGH and NHCS.



- MRI utilisation rates in SKGH increased from 52% in June 2017 to 77% in February 2018.
- Cross-utilisation allowed an **additional 404 scans** to be performed at SKGH.



- MRI utilisation rates in NHCS increased from 55% in June 2017 to 62% in March 2018.
- Cross-utilisation allowed an **additional 298 scans** to be performed at NHCS.
- To facilitate the cross-utilisation, **cross-training** was done to **empower NHCS staff to perform knee and spine scans** (which were not routinely done at NHCS).

Conclusion

Objective and transparent monitoring of MRI machine utilisation across the cluster provided the Workgroup with meaningful data. This enabled the 6 MRI centres to collaborate and optimise the use of expensive MRI assets. The resultant synergy and operational improvement provided better access to this valuable MRI resource and improved patient care delivery.