Using an Interactive Dashboard to Identify Revenue Leaks

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Background

- In SKCH and OCH, we buy some services from co-located hospitals such as SKH and SGH.
- The service charges in patient bills are usually triggered by the completion of services ordered in ancillary systems, the charges will then flow to our billing system via interfaces.
- E.g. Drugs from Maxcare, laboratory and radiology charges from RISPAC/LIS interfacing to SAP-ISH.

- As we operate in an environment of complex transactions managed by multiple ancillary systems, it is important for us to monitor the service consumptions and charges over time in order to identify unusual events/records. This is in addition to relying on exceptions report from SAP to identify any interface failure as there could be instances where services dropped at source system may not be known to us.

For instance, we experienced an interface failure in 2020 from the clinical system to our billing system which resulted in service charges being dropped and the resulting revenue leakage. There was no failure report from SAP-ISH as the drop occurred at upstream system. This incident further highlighted the importance of monitoring the service charges overtime and prompted us to look at how we can detect such leakage given that we are at the receiving end of the process.

Objective

- Our objective is to analyse the service consumptions and revenue for any abnormalities by leveraging on charts from SAP reports so as to identify potential sources of revenue leakage for our 2 community hospitals. i.e. Sengkang Community Hospital (SKCH) & Outram Community Hospital (OCH)

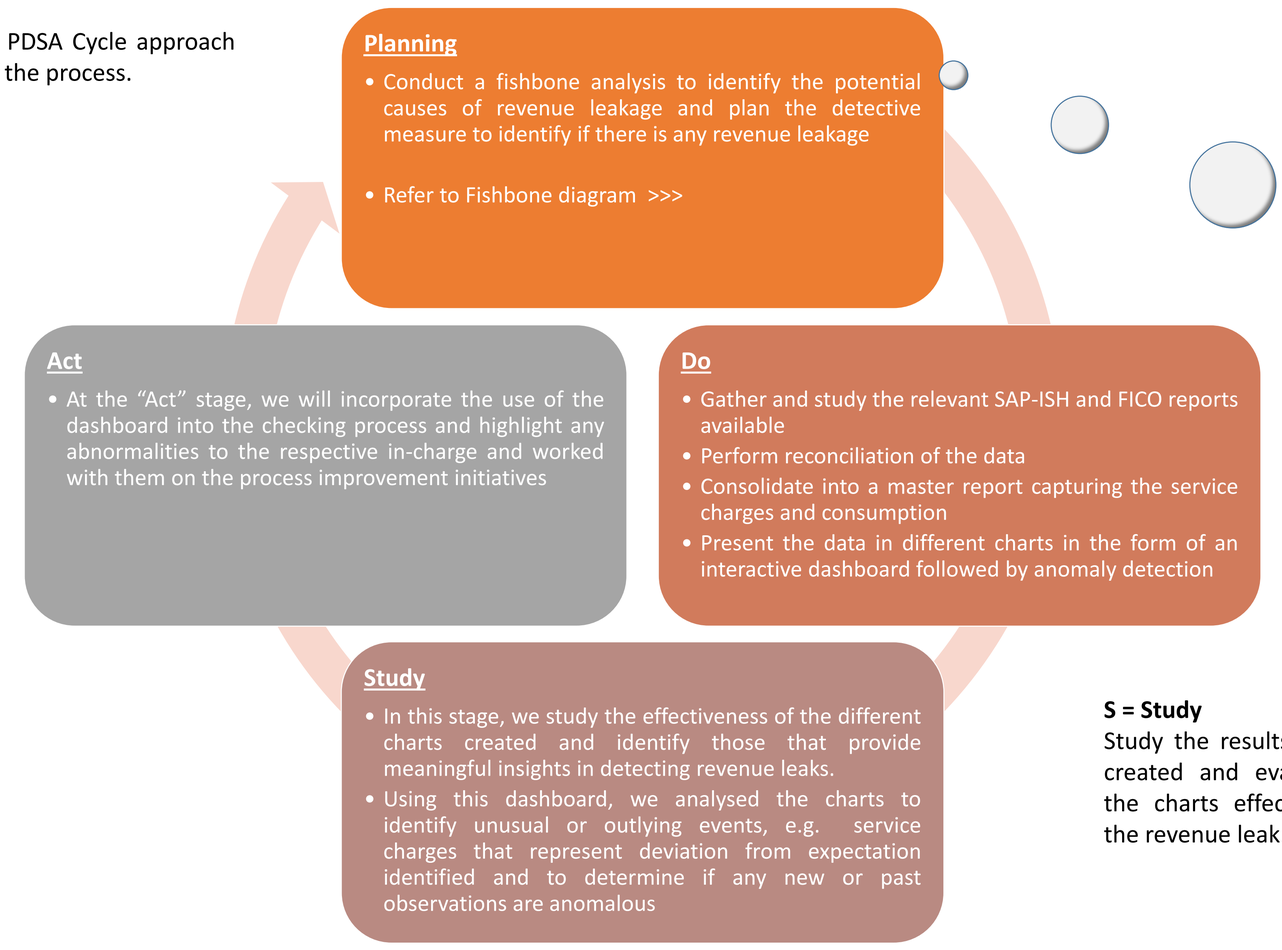
- We will generate and consolidate the various reports from SAP-ISH and FICO modules, reconcile the data and present the data in charts in the form of an interactive dashboard.

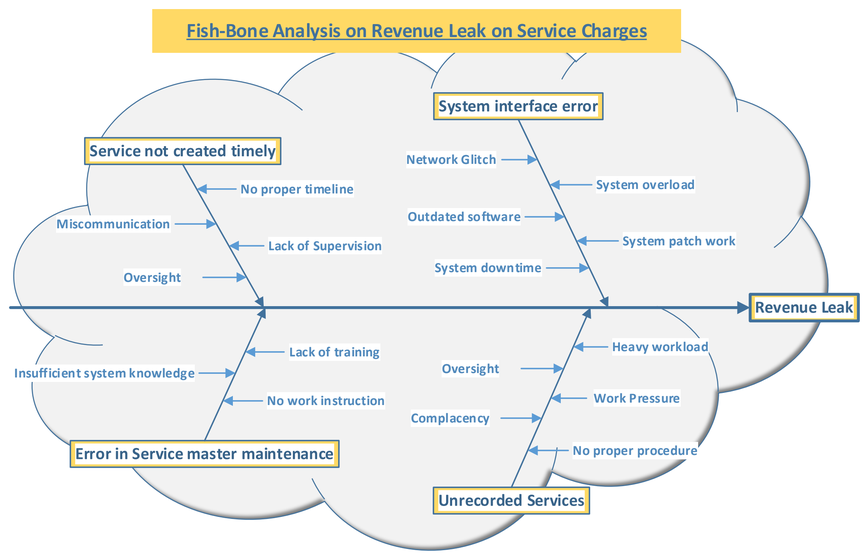
Methodology

For this project, we adopt the PDSA Cycle approach for continuous improvement of the process.

P = Plan
Understand and identify the problems and discuss the potential solution to be tested. Here we are looking at ways in which we can detect revenue leakage in patient billing so as to identify the causes which could be system interface failure or error and unrecorded services due to human negligence such as oversight.

D = Do
This stage of the approach requires us to implement and test out the plan. We have gathered the relevant data, and developed an interactive dashboard with charts and tested out if these charts serve the purpose as intended i.e. being effective in detecting revenue leak.

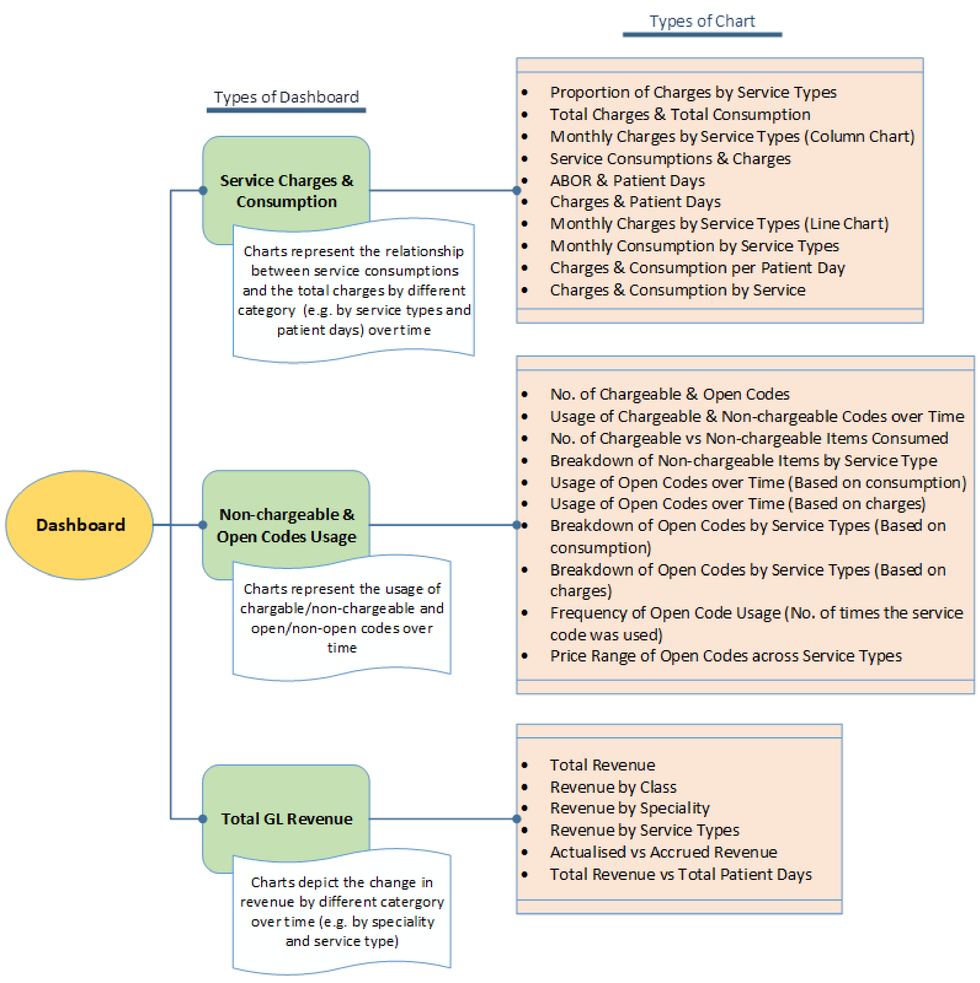




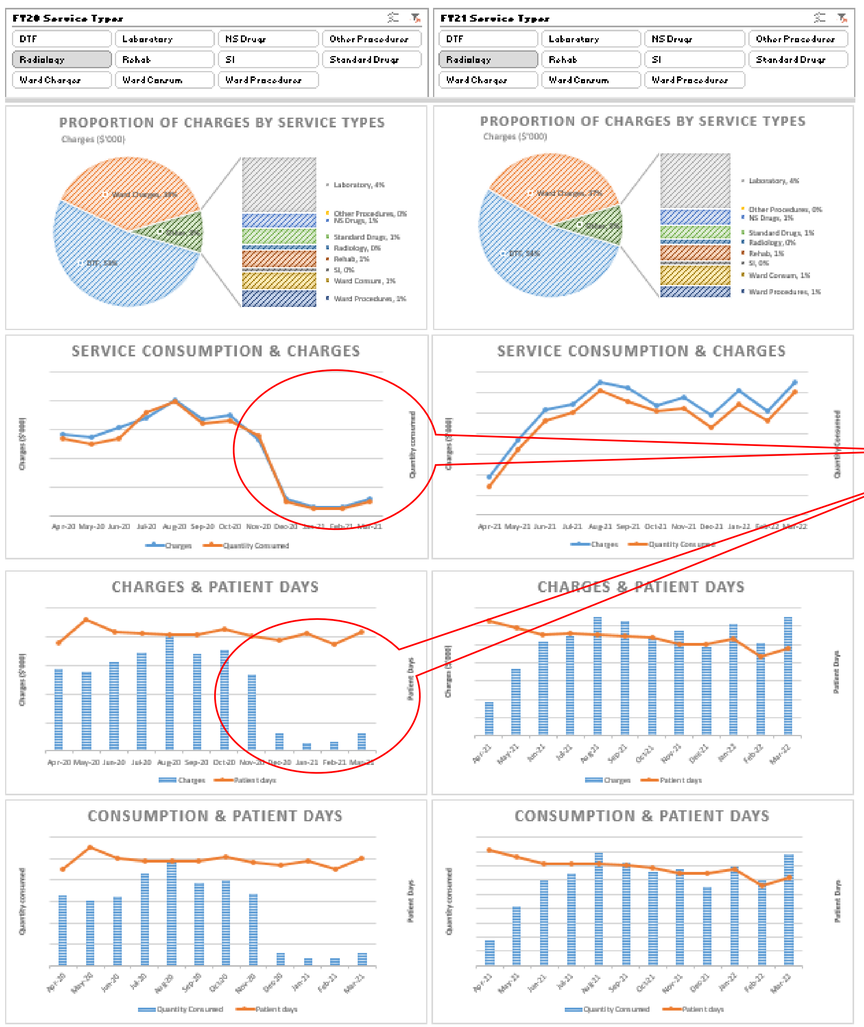
S = Study
Study the results from the charts created and evaluate which are the charts effective in detecting the revenue leak.

A = Act
Implement the Change. Incorporate the interactive dashboard into our checking process. Charts proven effective are incorporated into the interactive dashboard and to be updated frequently so as to facilitate continuous monitoring of the service consumption and charges.

Result



The result are interactive dashboards that provide users with the flexibility to review and monitor the service consumption and charges from different perspectives and time periods with just a few clicks.



The various service master charts in the dashboard presented the service consumption and charges in a trend/pattern in which we can easily identify any abnormality in the trend to identify any unexpected behaviour (e.g. with the people or systems) that could reveal potential flaws. These could be highlighted to relevant parties to determine if the abnormality or behaviour has any critical impacts on our operation or financial performance and for further actions to be taken.

One such example is the declining trend of consumption and charges of radiology service as evident from the "Service Consumption & Charges" and "Charges & Patient Days" charts. It relates to radiology service charges drop caused by the interface failure in 2020 that leads to revenue leakage.

Such dashboard may not be able to provide a timely discovery of issues but it serves as detective tool to enable us to perform continuous review and monitoring of our service consumptions and charges overtime. Allowing us to detect any abnormality early and prevent further escalation of the revenue leaks caused by activities that are unexpected, unintended and not within our control.

Conclusion

As a detective measure, leveraging on simple data visualisation in an interactive form will allow us to monitor and identify any unintended activities that may otherwise be missed in our service and billing transactions (e.g. drop in service consumed and corresponding charges due to the interface failure at the source system), and ensure the right capture of data in our system for the purpose of accurate billing and financial reporting.