



Singapore Healthcare Management 2024

Enhancing Medical Supply Resiliency For Public Health Institutions Through An End-to-End Dashboard

Authors: Wayne Wong Wen Kang, Jasper Tang Muar Choon

1. Introduction and Aim

As ALPS continues to transform Singapore's healthcare supply chain, the Supply Chain Service Operation's (SCSO) team faces challenges from various perspectives:

	Supply Chain Perspective
<input type="checkbox"/>	Need for visibility on the End-to-End process, to ensure medical supply resiliency
<input type="checkbox"/>	Able to identify and mitigate potential issues that affects availability of medical supplies
	Inventory Management Perspective
<input type="checkbox"/>	Assure adequate stocks for Public Health Institutions (PHIs)
<input type="checkbox"/>	Minimize stock out situations
	Fulfilment Management Perspective
<input type="checkbox"/>	Assure optimal productivity for fulfilment
<input type="checkbox"/>	Ensure delivery is made on time

To meet the challenges, the team started an initiative to develop an End-to-End dashboard, with the aim to :

- Develop an accurate and scalable solution that measures inventory and fulfilment metrics
- Enable data driven decision making that improves healthcare medical supply resiliency, ensuring timely availability of critical medical supplies

2. Methodology and Solution

The team adopt the PDCA framework to provide a structured approach to problem solving, ensuring a successful implementation in solution:

A. Using PDCA to Identify and Complete Critical Tasks

1. Plan

- From workflows, SCSO team **identified potential lagging and leading indicators** for tracking
- Joint discussion with ALPS IT team, leading to **ALPS Pyramid with Enterprise Data Warehouse(EDW) as solution**, supporting use cases such as large, historical datasets of at least 3 years, as well as a sizeable amount of ~ 30 users
- In addition, **22 Data Sources from SAP and OMS** were identified, **to establish data pipelines to EDW**

2. Do

- UAT** conducted between Nov'23 to April'24 **to test and validate data pipelines**, to ensure requirements are met
- Co-currently, **prototypes were built to conceptualize ideas** with and tested via Excel
- Upon data pipelines being established, the **prototypes were ported to Pyramid Solution** for further testing and fine tuning

3. Check

- Gather feedback from stakeholders** to refine and iterate on the dashboard design, ensuring an intuitive and user-friendly interface through continuous improvement
- Conduct checks to ensure accurate reporting**, including data accuracy, data freshness, data reliability and data accessibility

4. Act

- Refine the dashboard** based on feedback, ease of usage and insights
- Monitor and evaluate the impact of the dashboard** on decision-making and business outcomes
- Document lessons learned and best practices** for future dashboard development

B. Conceptualizing and Finalizing Requirements

Identifying Indicators, Conceptualizing Ideas via Prototypes

Identifying Sources For Data Pipelines

SAP: 9 Sources OMS: 13 Sources

Data Pipelines

Enterprise Data Warehouse

C. Implementing The Actual Solution

Key Features

- Common Access to a Common Data Source**: [A,B] : Ease of access to dashboards and all relevant data pertaining to inventory/fulfilment process. [C] : Ease of maintaining user control, sharing across SCSO team
- Summary Views to Identify Key Issues for Decisions**: [A,C] :Allows users to identify key issues, for decision making [B] : Alerts can be customized, based on user's trigger point
- Data Drilldown from Summary for Further Analysis**: [A,B, C] : User can dive into the details of data and export it for further analysis. Additional attributes can be added, if required

Note : Actual data has been excluded from the visuals

Results & Conclusion

There are numerous benefits generated from the project, including:

	Improved Process Visibility	<ul style="list-style-type: none"> SCSO team is now able to review the inventory and fulfilment info, allowing better support to PHIs and the Healthier SG initiative Enables a more informed decision making and proactive management
	Enhanced Collaboration	<ul style="list-style-type: none"> Ease of sharing dashboards and relevant common data across different teams This enhances collaboration, enabling a more cohesive and effective approach in solving supply chain issues
	Ease of Customization	<ul style="list-style-type: none"> Ease of customizing visuals, as well as calculation logic for indicators This allows iterations of dashboard to be done efficiently, for continuous improvement and inclusion of new business rules
	Manpower Savings	<ul style="list-style-type: none"> Comparing to a manual solution which requires 6 headcount, the solution frees at least ~ 14 hours, per headcount per day This works out to 1680 work hours per month. Assuming an average wage S\$10 per hour, this works out to \$16,800 per month

The implementation of the solution has enabled the respective teams to have improved visibility for better collaboration, ensuring reliable medical supply delivery to Public Healthcare Institutions. This initiative aligns with our goals of bolstering healthcare supply chain infrastructure against varying demands and ensures continuous patient care