Project Title

Transforming Public Healthcare's logistics with ALPS Pyramid

Organisation(s) Involved

ALPS Pte Ltd, Integrated Health Information Systems

Healthcare Family Group(s) Involved in this Project

Healthcare Administration

Applicable Specialty or Discipline

Procurement

Aims

To provide an interactive and analytical dashboard to monitor and analyse supply chain activities for stakeholders in an environment that is constantly evolving due to changing situations and needs.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

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Project Category

Care & Process Redesign, Value Based Care, Operational Management, Supply Chain, Inventory Management, Data Analytics

Technology, Digital Health, Data Analytics

Keywords

Business Intelligence Analytics, Analytical Dashboard, PYRAMID, COVID-19

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Transforming
THE PUBLIC HEALTHCARE'S LOGISTICS
with
ALPS PYRAMID

ALPS, a supply chain agency for public healthcare, was set up in 2018 to bring cost efficiency and process effectiveness through innovative supply chain solutions for public healthcare. Since inception, ALPS has consolidated purchases and implemented centralised management of inventory for public healthcare. From consolidation of procurement to warehousing to distribution, ALPS provides seamless supply chain solutions to our public healthcare institutions.

Before 2020, the traditional method of monitoring stockpile and forecasting of supplies was labour intensive with staff devoting up to eight hours a day to manually consolidate, analyse and format reports in Excel spreadsheets. The files were then shared via email, raising concerns of data security. This manual method was clearly inadequate to upkeep with ALPS' new mode of operations. With the constant evolving supply chain landscape, ALPS would need to predict the needs of public healthcare using data analytics to enable a faster speed to market delivery of demand. As such, ALPS embarked on developing a Business Intelligence Analytics dashboard.

"ALPS constantly challenge ourselves to create innovations in the public healthcare supply chain to support our stakeholders' aim of delivering excellent patient care," said Peter Tay, Chief Executive Officer, ALPS. "We embarked on re-engineering our supply chain approaches and processes to develop enhanced means of predictive analysis and monitoring, with increased visibility of data across all levels of the organisation. The speed of the deployment – from conceptualisation to delivery of the project – would not be possible without the collaboration and teamwork between ALPS and IHiS."
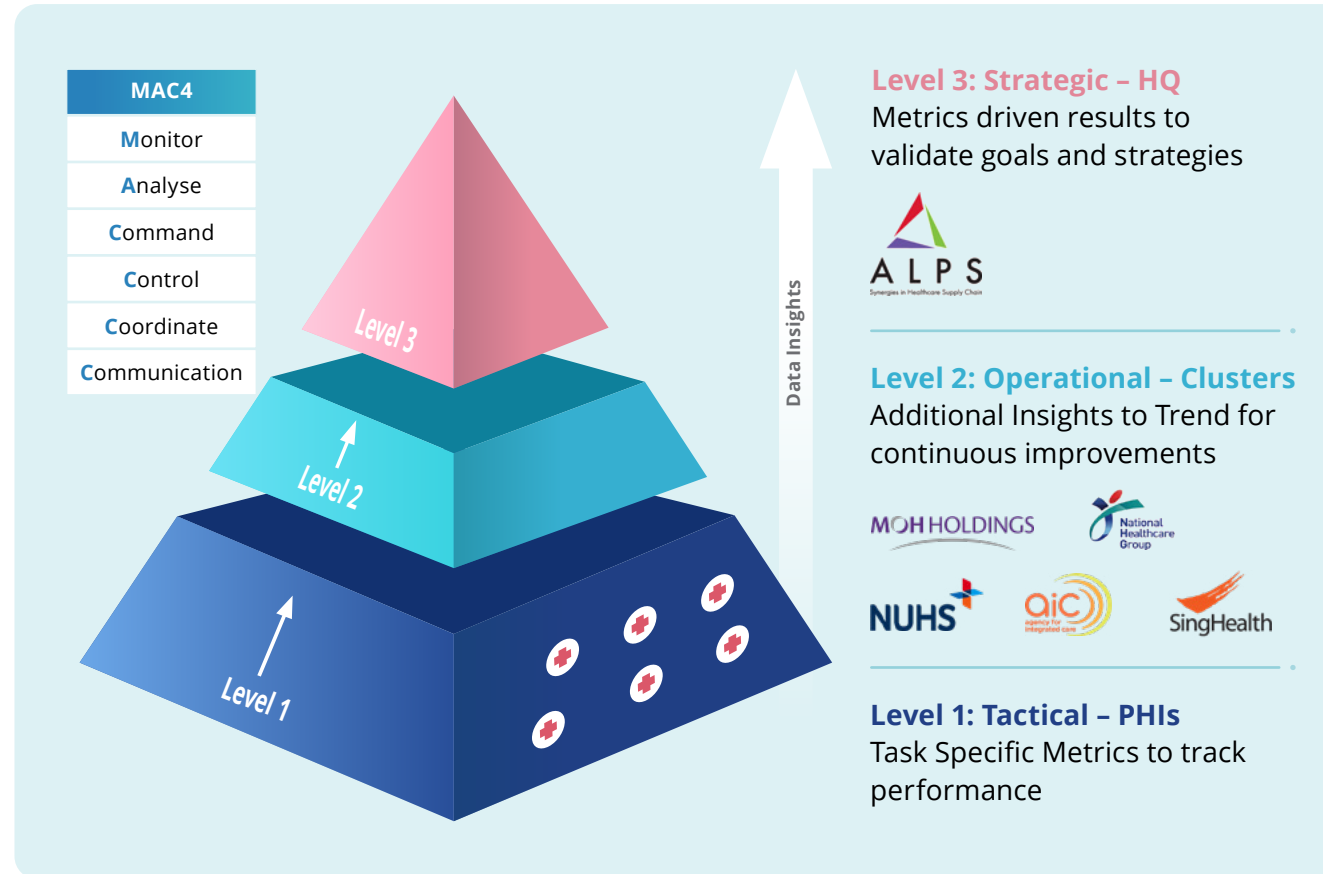
The development of Business Intelligence Analytics

The ALPS IT team, in collaboration with the IHiS' Data Analytics & AI (DNA) team, used Business Intelligence (BI) analytics to provide an interactive and analytical dashboard to monitor and analyse supply chain activities for the stakeholders in an environment that is constantly evolving due to changing situations and needs, especially in the current pandemic situation. Through data analytics and powerful visualisation, the dashboard pools all relevant information to provide comparative analysis and visibility of goods issued vs stockpile 24/7 online. The graphical representation of information and data, such as charts and graphs, enables good strategic decision-making spanning supply chain planning to inventory management to delivery status to ensure supplies will reach the patient for continuity of care.

For example, management has visibility of the personal protective equipment (PPE) stockpile. By conducting comparative analysis of goods issued vs stockpile, they also improve the forecasting of PPE requirement based on the weeks of supply threshold. This reinforces our commitment to safety of our healthcare workers, while ensuring that Singapore's healthcare response is uninterrupted during this critical period.

The interactive analytical dashboard named PYRAMID, provides a platform for users to generate visual information within the healthcare cluster. Just like the name suggests, PYRAMID pulls data from various sources into a single analytic engine and pushes out multiple visualisation for users to formulate strategies and plans to mitigate any possible risks, like disruption of supplies.

The PYRAMID dashboard could be accessed via corporate laptops 24x7 for timely intervention to any supply chain incidents.

MAC4
Monitor
Analyse
Command
Control
Coordinate
Communication

Level 3
Level 2
Level 1

Data Insights

Level 3: Strategic – HQ
Metrics driven results to validate goals and strategies

Level 2: Operational – Clusters
Additional Insights to Trend for continuous improvements

MOH HOLDINGS   National Healthcare Group
NUHS   AiC   SingHealth

Level 1: Tactical – PHIs
Task Specific Metrics to track performance

24x7
access via corporate laptops available for intervention to supply chain incidents

Graphical representation provides comparative analysis and visibility of goods issued vs stockpile 24/7

ALPS' COVID-19 dashboard

With the public healthcare's focus on managing the pandemic situation, **the first ALPS Pyramid dashboard – COVID-19** was developed and went 'live' on 15 May 2020. It supports the hospitals' COVID-19 operations, tracking critical medical supplies across the hospitals in an interactive dashboard for accurate and responsive demand management.

The COVID-19 dashboard allows:

Visibility of personal protective equipment (PPE) stockpile on hand vs goods issued and available weeks of supply (WOS), organised by product family;

Interactive analytical insights into trends over a period, with key filters allowing drill-down to cluster, institution, product family and desired period and parameters based on WOS threshold and limit.

Getting started on COVID-19 dashboard

A project team was set up to gather requirements, plan data format, design the dashboard layout and formulate an engagement plan to ensure it not only fulfilled the needs of the users, but was easy to use. Besides engaging the senior management on general direction, objectives, assurance of data accuracy and completeness for their needs, the team actively involved data providers to understand the process and concerns to create a dashboard that is easy to understand and provided timely, accurate information for end users.

"The ALPS IT team adopted the Agile methodology for the dashboard implementation," said Tay Yeow Leng, Assistant Director, ALPS CIO Services. "We conducted multiple review sessions with users to validate the development at different points of the project. This methodology worked very well and is a great learning point for the team on how we can approach similar projects in future."

The benefits of ALPS' COVID-19 dashboard are evident. With a single dynamic dashboard, **information availability has shortened from quarterly to monthly, and the effort to collate all submissions from different departments reduced by 50 per cent.**

The ALPS Pyramid Journey

The COVID-19 dashboard took **four months to develop**, including gathering user requirements. The ALPS IT team went on to develop **four additional dashboards with ALPS' stakeholders in six months**, which went live since April 2021. Two additional dashboards were rolled out in May and August 2021. These are operational dashboards that helped ALPS to organise data into intelligent information that is useful for users in ALPS and the PHIs to make strategic decisions such as operations and performance indicators.

Despite the achievements, the ALPS IT team shared that there were multiple challenges they had to address in their COVID-19 dashboard journey, including data "hygiene" and presentation. The team developed a programme on Python to **automate the detection and correction of corrupted or inaccurate data**. The cleansed data was then fed to the dashboard for data visualisation. This removed the manual and tedious process of data cleansing.

"Dashboards are like puzzles. When it is put together properly, the dashboard will present an overview picture to its users. Each data point is a piece of the puzzle. The team conducted numerous sessions to go through each data field within the dashboard to ensure that each piece of data is accurate and relevant."

Yeow Leng, *Assistant Director, ALPS CIO Services*

With the benefit of experience from the first dashboard, ALPS IT leveraged the same team to design and build the four additional dashboards, eliminating the lead time needed for knowledge transfer.

Future of ALPS Pyramid

"We will continue to develop new dashboards based on ALPS' stakeholder requirement to continually improve Singapore's healthcare supply chain and make it more sustainable and resilient," Yeow Leng concluded.

The ALPS Pyramid Journey:

01
COVID BI Dashboard Pilot
May, 2020

02
Analytics and Business Intelligence Roadmap

03
4 new Dashboards Go Live
April, 2021

04
New Capabilities & Enhancements

Visibility >> **Adaptability** >> **Accessibility** >> **Predictability** >> **Scalability**