

## **PPE Inventory Visibility & Management - The Development of Foundry System**

**Introduction:** This paper covers the current state and the proposed journey of Foundry (the platform solution used to provide inventory visibility within Trusts for PPE), and its potential beyond the Pandemic. Essentially, the PPE system is moving from Emergency Push to fully automated Replenishment, which is the most efficient, lowest cost, highest service Supply Chain solution.

**Background:** Prior to the Pandemic all PPE items were purchased either directly by Trusts or through SCCL using a pull system (orders placed) - numerous people in a Trust would order at the requisition points. Ordering would be done in a non-systematic way and SSCL would purchase items to ensure an 8-week stock level (based on historic demand) was available for Trusts to call off from. There was no national inventory visibility or common stock policy, each trust essentially doing its own thing.

When the pandemic started PPE usage rates multiplied by x25-40, the consequence was the stock held centrally moved from 8 weeks to around 2-3 days, which saw panic in the Trusts as they tried to acquire PPE to protect staff and patients. In addition, shortly after the start of the pandemic China, the source of a significant amount of the global PPE production, closed its borders. Several challenges quickly emerged:

- 1) A significant surge in demand, which was instant with depleted stock almost immediate.
- 2) Reactive procurement; Nationally, Regionally and in Trusts.
- 3) Hoarding, with quantity vs quality often driving early decisions.
- 4) The PIPP stock being released after being in a closed store model - with many items beyond their shelf life.
- 5) Centrally there was no visibility of stocks in Trusts or Burn (Usage) rates
- 6) Trusts normal stock holding on items was around 14 days – the volumetric impact of this was a need for circa 30x the space traditionally required
- 7) No way to centrally allocate PIPP stock do to lack of visibility in Trusts

Post and emergency phase of 'Blind Push'; Palantir and the PPE Cell set the Foundry platform up to help manage the issue. Implementation to date has followed several Phases:

1. **Phase 1** – All available PPE stocks / PIPP was collected centrally and Foundry was used at the start of the pandemic to address 4 & 7 above, ensuring that the PPE available from SCCL stocks was shared out to the Trusts in a straight Push. High levels of emergency reaction / mutual aid / local procurement also supplemented this.
2. **Phase 2** – Central warehousing at Trusts started (6). As more stock came in centrally, Foundry was developed to use the actual Burn rates and local Stock holding (manually entered) to build a demand picture. Distribution remained mainly on a push basis. High degrees of manual input from both Trusts, Regional & Central teams was required, and Mutual aid remained on going.
3. **Phase 3** – Foundry was further developed to an auto replenishment system based on Burn rates and local stock levels. Regular deliveries based on a demand signal now topping up local stock levels and providing higher degrees of comfort, moving from Push to Replenishment model. Limited changes being made to the proposed stock movements to the Trust. Smaller demand items have moved on to the replenishment model, i.e. Fit Testing solution.
4. **Phase 4** – This phase is in action and will be complete by end of September 2021. The objective is to improve the customer experience and automate the input feeds where possible. Foundry as a system will sit behind the local Inventory Management Systems (IMS), reducing the need for 2 systems but maintaining the gains achieved through Phase1-3. Pilots are being run to

automatically collect the IMS data at the Trusts and feed into Foundry. This capability will be available for around half the Trusts, with the remaining continuing to input data directly onto Foundry, but at a much-reduced level (once per week vs daily)

5. **Phase 5** – As more Trusts automate their local IMS through Scan for Safety, they will be able to automate the stock data collection for PPE through Foundry in the background.
6. **Phase 6** – Any product captured on a Trusts IMS can be fed into Foundry and auto replenishment from a central supply can be initiated more broadly.

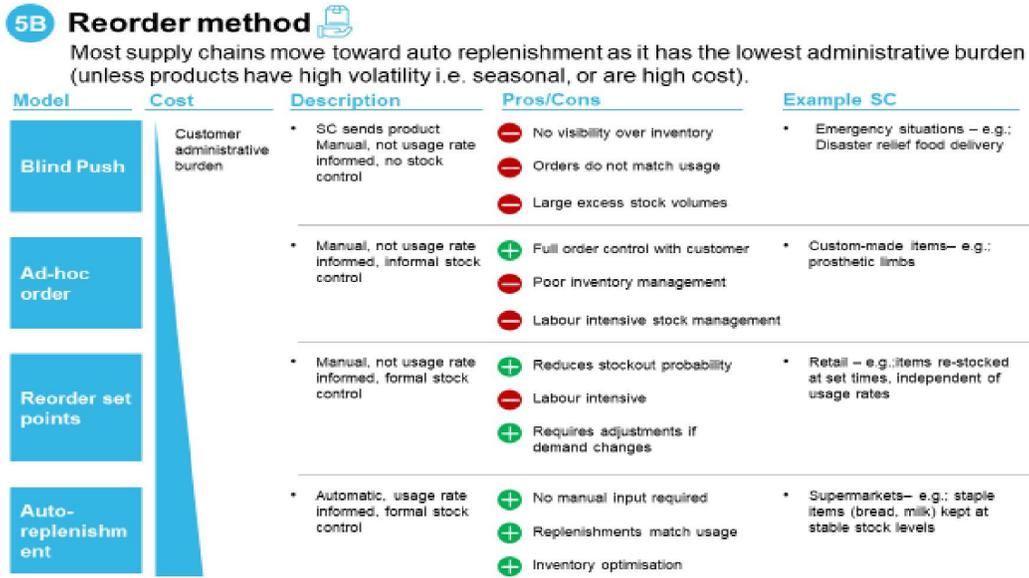
The journey being taken is a known one within external Supply Chains and is best shown pictorially in Appendix1.

**Conclusion:** The impact of the changes over the last 18 months are shown in the table below, with additional detail provided in Appendix 2.

	Orders	Stock Levels	Demand Modelling	Stock Outs	More than PPE
Pre Pandemic	At point of use / random pull based on user perceived use	Random	Historical data to provide stocks	Regular as buying by brand vs category	Yes
Current	From manual stock takes	Consistently > 14 days demand since Nov 2020	Using R-modelling and use data	None since June 2020 however supported by NSDR / Emergency supply when stock takes missed	Not practical due to data entry
Potential Future	Automated from system based stock counts, optimised deliveries and quantities	Can be maintained to suit Trusts / delivery patterns	Foundry use and stock data and S&OP Anaplan modelling	Continue to maintain stocks at target level without the risk of missed human inputs	Access to stock levels on all items so expansion is possible

The pandemic highlighted several gaps within the NHS PPE Supply Chain, not least around inventory visibility and order management. Over the course of the last 12months the PPE cell has worked to close these gaps through the use of Foundry as a key NHS Platform. The capability that has been built could and should now be rolled out at an accelerated pace through the Systems Project built for SCCL. This capability accelerates the NHS Supply chain into a space that benches with other external supply chains, through the adoption of best practice. Increasing breadth and usage beyond just PPE is now easy and can be done with very little change but potentially significant benefits. Central teams can access and identify stock holding and use data at Trusts to top up stock levels (replenish) as required. Long term as the system matures it will mean that reduced stock holding can be held at Trusts and the central supply process can be optimised, through the use of more accurate demand data, increased time and visibility and the correct automatically collected stock levels. Whilst this does provide a much more advanced Supply Chain capability it is nevertheless a big change to implement and leverage the long-term benefits for the wider system.

**Appendix 1: Push – Order – Replenishment Journey:**



**Appendix 2: The PPE specific Journey to auto replenishment.**

**The PPE Foundry Journey**



	Pre Pandemic	Mar-Jul 2020	Aug-Dec 2020	Jan – July 21	August 21 – April 22	Future Options
Trust Stock Levels	Locally managed / stocks held at ward / across Trust	Information starting to be gathered	Trusts providing a consolidated manual data feed daily	Trusts providing a consolidated manual data feed daily	Foundry reading a WMS system signal automatically daily where available daily or a manual data feed weekly	Foundry reading a WMS system signal automatically daily
Warehouse Management Systems (WMS)	Various manual and automated solutions 50:50 split	Various manual and automated solutions 50:50 split	Various manual and automated solutions 50:50 split	Various manual and automated solutions 50:50 split	Various manual and automated solutions 50:50 split	Electronic WMS at all sites
Process to order PPE	Trust level Manual, pull orders at ward level based on history	Manually run central allocation / even share	Semi manual Central allocation based on burn rates and stock levels input manually at Trusts	Automatic replenishment based on burn rates and stock levels input manually at Trusts	Automatic replenishment based on burn rates and stock levels input split between seeing stock at Trust automatically / manually where no WMS system	Automatic replenishment based on burn rates and stock levels automatically from Trust WMS systems
How Items selected	Brand Name / Sub Category	Category	Sub Category	Sub Category Brand on FFP3	Sub Category Expanded Brand FFP3, Gowns	Sub Category and Brand
SKU's	334 on SCCL catalogue	334 manually allocated	200 manually allocated via Foundry / NSDR 124 back to SCCL	74 via Foundry 60 via manual / pull 200 back to SCCL	c90 via Foundry automatically / pull c244 back to SCCL	Ability to see / auto replenish any set of SKU's
Data Integrity	No Central data	Limited visibility	Errors / Operator dependent	High System gaming	50% Visible	100% visible

Increasing Automation / Customer needs / expanding capability