



Ithaca Supply Chain Management Pty Ltd

ACN 095 922 339

HTRAK

POINT-OF-USE DATA COLLECTION

POST-PILOT REVIEW:

THE ALFRED (MELBOURNE, AUSTRALIA)

OUTCOMES IN MEDICAL IMAGING DEPARTMENT

Wednesday, 24th March 2004

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Contents

Executive Summary	1
The Problem	2
The Remedy	2
The Test	3
The Review	
The Reviewing Organisation – Ithaca Supply Chain Management	3
Objectives of Review	3
Baseline & Review Methodology	4
Implementation	4
Standards & Health Supply Chain Networks	
Overview	5
Hospital Experience	5
Supplier Experience	5
Pre-hTrak Outcome	5
hTrak Deliverable	5
The Benefits	
Process Improvement Outcomes	6
The Alfred	6
<i>Patient Safety – Traceability</i>	6
<i>Cost-to-Serve Comparison</i>	7
Suppliers	8
<i>Process Change</i>	8
<i>Improved Sales Opportunities</i>	8
<i>Hospital Relationship Outcomes</i>	8
<i>Advantages & Disadvantages</i>	9
Cost / Revenue Improvement	
Working Capital Reduction	9
Schedule Five Rebate Improvement	10
Systems	10
The Alfred	10
Suppliers	10
Qualitative Analysis	12
Concerns & Opportunities	13
Security	13
A Third Party in the Hospital – Supplier Relationship	13
'Scanability' & Standards Adoption	13
Back Orders & Receipting	14
Interfaces & Information (Reports)	14
Automation	15

Appendices

- A. Pre-hTrak Process Maps (Hospital & Supplier combined)
- B. Current hTrak Process Maps (Hospital & Supplier combined)
- C. Future Projection hTrak Process Map (Hospital & Supplier combined)



Executive Summary

hTrak has been piloted in the Medical Imaging Department of The Alfred Hospital, Melbourne over a period of seven-months. A Baseline Study was conducted prior to the hTrak implementation; this was designed to determine the cost, service levels and efficacy of existing processes and systems used by the hospital and suppliers to conduct replenishment, procedure costing, rebate claiming and item traceability.

These measures – and some others – were replicated in the post-pilot review. Outcomes showed very significant benefits had been realised by the Medical Imaging Department as a result of the implementation to date. Suppliers, although not realising major benefit at this early point due to the relatively small size of the Alfred's business as a percentage of their whole, were also extremely enthusiastic about what the technology would offer them as it was implemented more broadly. The benefits measured to date include:

- ✧ Process improvement in the Medical Imaging & Supply Departments equates to a recurrent \$81K productivity improvement with opportunity to further reduce clinical commitment while improving service;
- ✧ Opportunity exists for suppliers to accept electronic messages using standard messaging and data sets directly into their systems, use real and timely information to replenish, forecast, plan and manage inventory more effectively;
- ✧ Suppliers able to engage electronically with the hospital as a result of accepting electronic replenishment orders – based on a 12-month Standing Order arrangement – report higher sales and lower cost-of-goods-sold relating to those accounts;
- ✧ The Medical Imaging Department made a one-off \$127K saving of working capital and a recurrent opportunity to reduce working capital expenditure by \$35.5K per annum. Based on Ithaca's work in other similarly sized public and private hospitals this level of opportunity is indicative of 'normal' practice;
- ✧ Schedule Five rebate claims improved by 100% within nine months and will provide an additional \$40K in additional rebate claims every year;
- ✧ Patient safety is dramatically improved as hTrak is able trace all implantable items to patient;
- ✧ Actual procedure costing data is able to be used in CaseMix / DRG compilation instead of basing these decisions on averages;
- ✧ Informed and timely decisions can be made regarding facility and resource management;
- ✧ The potential for suppliers to implement a more efficient and cost-effective method of managing consignment stock is facilitated by hTrak.

Attitudes toward the use of hTrak in all the situations and applications described above – by clinical, administrative, customer service, sales and information technology staff – are uniformly enthusiastic and accepting. Concerns raised have been dealt with rapidly and effectively.

Of the concerns that are outstanding – security, relationship, use of standards, implementing back order and receipting processes and full automation – users accept that, in essence, these offer opportunities for further improvement rather than impediments to take-up.

Ithaca's core findings are that the hTrak system works extremely effectively for automated replenishment, patient procedure costing, schedule five rebate claims, item traceability, optimisation of working capital investment and facility management among several others. There are opportunities for further improvement however the system stands alone – delivering timely and accurate data supporting the uses described above.



The Problem

Effective inventory management – associated with automated replenishment, accurate procedure costing, efficient identification and claiming on government rebate items, traceability of prostheses to patients and reports contributing positively to productivity and facility utilisation improvement are all business processes that have been virtually impossible to manage effectively in the current hospital environment. The absence of tools to manage these areas has led to enormous waste and loss of opportunity in hospitals throughout Australia and the world.

The core reason that effective inventory management and control and accurate patient procedure costing has been so difficult to capture in hospitals is the absence of data on product use, labour, and other resources captured at the point and time of use. The 2002/2003 Annual Report of Health Purchasing Victoria noted the following key problems with their Strategic Direction #3 addressing Data Collection:

"Although extensive communication regarding the use of the data has been achieved, the securing of timely and accurate data remains a significant challenge for both HPV and health services.

Many hospitals have found it difficult to provide information, either in absolute terms or in a timely manner to facilitate cost modelling on a hospital-by-hospital basis."

Typically almost all medical and surgical consumables used in a hospital environment are expensed on issue from the store (stock) or on delivery from the supplier (non-stock) – without any further data collected on ultimate usage or waste. Studies¹ show that the level of waste is generally around 20% of all items on hand (c.100 days) – or, in a budget of A\$20 million for medical / surgical items in a 300 bed hospital, around A\$1.2 million every year.

Transactional costs for hospitals associated with the ordering, authorisation and payment for the 80% of items that are non-stock are extremely high as a separate transaction is entered into every time an item is required. Suppliers of items suffer equally from this dearth of information as they need to hold excessive inventory to meet unpredictable demand, are unaware of the usage patterns for their products and continue to process most orders manually.

Costs associated with collecting data to determine accurate procedure costs are similarly time-consuming and haphazard. The recording of data is inconsistent and just one procedure cost could take hours – finding records (if they exist), extracting data, costing and producing a report.

The Remedy

hTrak is a point-of-use data collection system that seeks to solve the problem of gathering timely and accurate product usage data within hospitals. The system also provides functionality for recording data on labour and overhead inputs for each procedure, enabling the determination of patient procedure costs, facility utilisation, prostheses tracking by lot number, automated replenishment messaging to suppliers and complete reports on items generating rebate claims.

The tool provides reports that empower management to make informed decisions and, for the first time, offers great enhancements to patient safety through its ability to trace implants to patients. It is built in an Application Service Provider model and easily interfaces with inventory management, finance and other systems, providing the missing link in the hospital supply chain.

¹ *Diagnostic of the Australian Supply Chain to Hospitals*, Final Report by PriceWaterhouseCoopers May 2000; *Summary Report of Inventory Reduction & Standardisation Project at The Alfred*, by Ithaca Supply Chain Management Pty Ltd, March 2004



The Test

hTrak is being piloted in the Medical Imaging Department of The Alfred². The pilot went live in April 2003, and has now been running for over eleven months. In this period, fine tuning of the system and constant monitoring has been carried out. Continuous discussions with various suppliers and the hospital have been performed throughout the pilot to facilitate smooth operation of the system and identification of further opportunities.

Ithaca Supply Chain Management conducted a Baseline Study ahead of this implementation – to benchmark cost-to-serve for replenishment and order management, inventory and rebate levels and effectiveness of prostheses traceability. This study initially involved the hospital and two major suppliers – Boston Scientific and Cook Australia – with other suppliers (Terumo and Johnson & Johnson) joining the study prior to the review.

The intention was to revisit the parameters measured in the Baseline Study during a review process following implementation. This paper is the result of that review.

The Review

The Reviewing Organisation: Ithaca Supply Chain Management

Ithaca are a 'hands-on', supply chain practice specialising in the delivery of holistic supply chain reform and change facilitation services in the health, pharmaceutical and food sectors.

Ithaca was engaged by hTrak to provide a benchmark and undertake an independent assessment of the post implementation results. They have extensive experience in delivering process-oriented supply chain reform in hospital environments, using their in-depth understanding of operational and strategic issues to facilitate effective change.

Ithaca takes pride in their independence and, while choosing to work with leading edge technology solution providers, they do not promote any software, hardware or other product or service that is not suited to client's specific needs. More can be accessed at www.ithacascm.com.

Objectives of Review

The objectives sought in the Review match those set for the Baseline Study:

- ✧ Measure and understand the baseline (pre-implementation) and review (post-implementation) costs, benefits, advantages and disadvantages applicable to those organisations using the hTrak solution for patient procedure costing, rebate claims, prostheses traceability, inventory management, replenishment and product usage data;
- ✧ Measure and understand the before and after status of supply chain process, cost and organisational structure / job design (clinical, administrative, supplier, systems etc.);
- ✧ Measure and understand changes in supplier's current ability to identify and track product usage and automatically replenish non-stock items;
- ✧ Measure and understand staff attitudes toward adoption and use of a hand-held solution – compared with their actual experience using the solution.

In addition to the above, further objectives were sought in the review stage:

- ✧ Examine the efficacy of all elements of the working business solution to see if improvements can be made to further optimise the benefit delivered;
- ✧ Identify any issues which need resolution to allow future rollout to occur;
- ✧ Identify lessons learnt from the pilot, which can be used by internal and external organizations.

² The Alfred Hospital is a 320-bed acute treatment and trauma hospital located in Melbourne, Australia



Baseline & Review Methodology

Measuring and documenting the situation before and after the pilot involved the following:

- ✧ 12 months of purchasing data was collected, analysed and combined with lead-time information and data collected from comprehensive pre- and post- pilot inventory audits to enable optimal stock profiling;
- ✧ Detailed process mapping was conducted of all supply, procedure costing and rebate-related activities through interviews and discussions with staff from throughout the Medical Imaging Supply Chain:
 - Nurse Unit Manager, Radiographers, Clinical & Medical Staff from within Angiography;
 - Purchasing Officers, Expeditors and Store-persons from Supply Dept.;
 - Accounts Payable, Management Accountants, Costing Analysts from Finance Dept.;
 - Director Information Technology and IT Support Manager from IS Dept.;
 - Managing Director, Manufacturing Director, Customer Service Representative, IT Manager and Inventory Controller of Cook Australia;
 - CFO, Operations Manager, Customer Service Supervisor, Inventory Analyst, Warehouse Supervisor and Customer Service Representative of Boston Scientific;
 - Vice-President, Supply Chain Asia-Pacific, E-Business Manager of Johnson & Johnson Medical (review phase only); and
 - Sales & Marketing Coordinator of Terumo Corporation (review phase only).

The process maps enabled cost-to-serve analyses to be completed, assessment of transactional volume, customer service levels, systems overlay and, combined with the optimal stock profiling activity that took place as part of the implementation, a definitive picture of one-off and recurrent working capital savings realized as part of the pilot.

Implementation

The implementation process for hTrak extended over a longer period than anyone had expected. This can be attributed to two facts:

- ✧ Very significant development of the system occurred over the implementation period;
- ✧ Data integrity issues in terms of getting the hospitals records (no catalogue was maintained for non-stock items) cleansed and aligned with the supplier catalogue (also problematic in terms of consistent adherence to standard product identification);
- ✧ Few parties were as ready to engage electronically as had been expected – the Baseline Study had identified this as an issue for the first time.

Despite the length of the implementation period all parties had high praise for the professional manner in which it was conducted as well as for the excellent developments that had been incorporated into the product as the pilot progressed.



Standards & Health Supply Chain Networks

Overview

Standard product identification has been mandatory in the grocery / retail supply chain for a number of years – as individuals we all experience it every time we visit the supermarket. In sectors using this simple technology the intelligence built upon the standard foundations is now extremely broad and deep. It covers category management, forecasting, sales and operations planning, Efficient Consumer Response (ECR), Efficient Foodservice Response (EFR), Collaborative Planning and Forecasting (CPFR), Quick Response (QR), Just-In-Time (JIT) and more. Point-of-use demand does in fact drive planning, forecasting and production scheduling in these cases.

Hospital Experience

In health no such standards have been used – instead we see that most hospitals have developed their own unique product numbering 'system' and item 'catalogue', linking only to internal – generally legacy – financial management 'systems'. Some have even implemented proprietary bar-coding regimes identifying either item or location – that cannot be read by any other system.

The time consumed by creating and attempting to sustain such regimes has been very significant. It has also been a waste as systems used in hospitals have proven inadequate and the business disciplines required to underpin them (if the systems could cope) have not been able to be instilled into the thousands of staff who need to comply on each and every ordering occasion.

Supplier Experience

Today between 50% and 75% of medical / surgical items carry either a manufacturer-generated, internationally accepted HIBCC or EAN bar-code that will identify an item or multiple of an item (many items are not identifiable at a 'single' or 'unit' level, only in packs). Each of these provides a unique code that can only apply to a single item wherever it is made throughout the world.

The use of one of EAN or HIBCC for product identification in the health supply chain is an appropriate response and would form part of the regime for compliance with the recently promulgated Australian Standards for Messaging and Data Sets (AS 5023.1, AS 5023.2). Such requirements are rapidly being adopted as mandatory by governments throughout the world as one avenue to facilitate efficient and effective, electronic communication of health sector supply chain activities and needs.

Pre-hTrak Outcome

The interesting thing about the above situation is that many suppliers choose to allocate a second 'identifier' to the products they make – doubling the creation and maintenance workload within their internal supply chain and making data integrity problems more likely. There are reasons for this choice, however in an optimised supply chain only one identifier would be used. Hospitals, oblivious of the opportunity to radically streamline their supply chain workload, generally do not require their suppliers to adhere to standard product identifiers, messaging or data set standards – continue to use their own 'identifiers' and maintain 'catalogues'.

hTrak Deliverable

hTrak relies on the placement of readable, international-standard bar-codes (and, eventually RFID chips) to identify unique items. This information can then, using universal inter-operable standards, be securely transmitted between organisations within the supply chain. Encryption technology and the use of a telco grade facility for the web server environment ensured only those organisations for whom messages are intended can receive and translate them.

In The Alfred pilot hTrak has demonstrated its capability to enable all parties to dispense with the multiple identification methodologies and multiple catalogues they use today. Instead the same identifier can be used throughout the supply chain and a single, supplier-generated catalogue can be maintained online for open access.



The Benefits

Process Improvement Outcomes

Appendices A, B and C depict the supply chain procedures in the Medical Imaging Department before the hTrak implementation, currently and projecting further process improvements into the future. It was not expected that supplier business processes would undergo any change at this stage – due to the fact that the Alfred Medical Imaging Department represents only a small percentage of total business for any one supplier. All suppliers did, however, point out in some detail the very substantial processes benefits they expected to flow once the technology was more fully adopted.

While processes are not fully automated at this point the opportunity exists to implement a fully automated supply chain process for both suppliers and hospitals plus more enhanced features including receipting, back-orders and productivity analysis in the short-medium term.

The Alfred

hTrak has empowered the Medical Imaging Business Manager to perform functions such as procedure costing, facilities management, performance comparisons and forecasting to levels which were not possible before. It has substantially reduced the involvement of regular nursing staff in routine inventory and order management activities – with further reductions possible, it allows accurate patient procedure costing and prostheses tracking – providing much greater levels of patient safety.

The hospital is now in a position to utilize information from hTrak to produce reports and budgets not previously available – the consequence flowing from these advances is better patient care. A few changes noted include:

- ✧ Supply chain processes are semi-automated, eliminating substantial non-value adding work in checking (counting), requisitioning, authorizing and expediting;
- ✧ Rebate claims are being submitted for all qualifying items, instead of only some items, and the time devoted to generating a claim has been reduced;
- ✧ Time previously spent producing inaccurate and incomplete reports on procedure costs and facility utilization is now spent analyzing the reports and actioning their accurate and complete content;
- ✧ Orders raised for those suppliers with Standing Orders are now electronic reducing the chances of human error and administrative cost;
- ✧ Activity-based budgets can, for the first time, be prepared using actual facts and figures rather than extrapolations based on extracting inconsistent data from legacy systems.

Patient Safety - Traceability

A key feature of the hTrak technology is the ability to collect lot number, expiry date and other critical information regarding prosthetic items. Patient safety is clearly of paramount importance to all hospitals – observations by Ithaca at The Alfred and many other hospitals show that collection of this data is currently incomplete, inaccurate and ad hoc – in no way meeting the burden of care in this area.

hTrak's ability to collect and file this information – then report it should a safety recall be promulgated – has been tested and proven in simulated circumstances at The Alfred. There are some issues with the need to manually enter some data sets in achieving this in a busy, live environment however these issues in the process of being addressed in hTrak Version II.

hTrak Post-Pilot Review: The Alfred Medical Imaging Department



Cost-to-Serve Comparison

Cost overlays for the supply chain aspects of the process maps during the Baseline and Review Studies, enhanced by a further process study done by Ithaca at the Alfred in the interim period, reveal the following comparisons:

Baseline					
	Weekly Commitment	Weekly Cost	Annual Cost	Overhead (30%)	TOTAL
Clinical	7 Days	\$1,312	\$68,250	\$20,475	\$88,725
Supply (770 orders, 1,509 lines³)	1.4 Days	\$150	\$7,800	\$2,340	\$10,140
Accounts	5 Hours	\$70	\$3,640	\$1,092	\$ 4,732
Total					\$103,597
Review					
	Weekly Commitment	Weekly Cost	Annual Cost	Overhead (30%)	TOTAL
Clinical	5.67 Hours	\$142	\$7,384	\$2,215	\$9,599
Supply (616 orders, 1,207 lines⁴)	1.1 Days	\$118	\$6,136	\$1,841	\$7,977
Supply Projection - 80% Suppliers on auto. Standing Order⁵	2 Hours	\$29	\$1,508	\$452	\$1,960
Accounts	5 Hours	\$70	\$3,640	\$1,092	\$ 4,732
					\$22,308

Clinical Staff. As can be clearly seen the vast majority of improvement has been in the reduction of clinical staff time spent on repetitive administrative tasks – this has not resulted in actual direct savings in FTEs but is providing recurrent and lasting benefits in the following ways:

- ✎ Improvements in quality of working life;
- ✎ Reduced need to engage agency or temporary staff.

Supply Department. The impact on the hospital's Supply Department to date has been less clear-cut. This is due to the fact that automated Standing Orders have not been activated with all suppliers. Those suppliers who form part of the review account for the great majority of suppliers to Medical Imaging however and there is an expectation in Supply that activation of the Standing Orders in the near future will result in significant process improvements for purchasing.

A number of receipting problems have arisen as items are not being packed separately by suppliers and they have to be sorted for delivery on receipt. This is being addressed through placing a requirement on suppliers for Advance Shipping Notices to enhance the receiving process. Supply has seen major improvements in the accuracy and completeness of order information and believes that this can only get better as more aspects are automated.

Further process improvements at the hospital end are definitely achievable – probably to 50% of current work levels – given the adoption of further enhancements to the hTrak functionality as suggested by hospital representatives later in this document.

³ Number of non-stock (all Medical Imaging orders were non-stock at the time of this measure) orders / order lines placed between 1st July 2001 – 30th June 2002 as recorded in the MS Access Database of Alfred's Supply Department

⁴ Current status – J&J & Terumo orders being fully automated, Boston Scientific & Cook about to come online

⁵ Expected Supply commitment when major suppliers engage electronically for automated order placement



Suppliers

No effort was made during the Baseline Study to cost the supplier aspects of the supply chain processes as they related to the Medical Imaging Department alone. Supplier processes were mapped in the expectation that, as time progressed and hTrak was adopted by a growing number of hospitals, there would be a benchmarked supplier process measurement in place against which changes would be demonstrated.

The two original suppliers, plus Terumo and Johnson & Johnson, were interviewed as part of the review process. A general set of questions was asked relating to process – and general responses were given as follows:

Process Change

- ☞ How would you anticipate your processes / systems might change if hTrak were installed in over 30% percentage of your customer hospitals?
 - Interfacing directly with our systems would then become a viable option – using the promulgated messaging standards for the health supply chain and assuming that outstanding security concerns were addressed;
 - Would be an evolutionary change in the type of people we employ in customer service – and the type of tasks they do. There would no longer be a need to check everything as error rates would be minimal due to seamless data exchange between point-of-use and re-supply – they would be more pro-actively focused;
 - Pricing and other errors would be a thing of the past in a Standing Order environment;
 - Our ability to forecast and plan and even improve production scheduling would be greatly enhanced – meaning that we could focus our own inventory holdings far more effectively and efficiently – even to the point of anticipating and dealing with seasonal fluctuations, doctors being on leave and more accurate sales budgets.

Improved Sales

- ☞ Did your willingness to engage with The Alfred in launching and testing hTrak result in more sales for you with that customer, do you expect your involvement in leading the way with this technology will lead to improved sales with other hospitals in the future?
 - Most suppliers who participated in the hTrak launch reported small improvements in sales within the Medical Imaging Department. All were positive about the Standing Order arrangements which firm up volume and pricing agreements over extended periods of time – rather than the day-to-day uncertainty of typical non-stock item supply.
 - There was also a general feeling that involvement in leading edge moves of this kind were an essential part of improving their own businesses internally whilst also improving their ability to satisfy customer requirements – and therefore, sales, in the long run.
 - One supplier stated that using this type of proactive approach, among other initiatives, they could increase their sales markedly while retaining their current staffing levels.

Hospital Relationships

- ☞ Has your involvement with the solution impacted positively (or negatively) on your relationship with The Alfred?

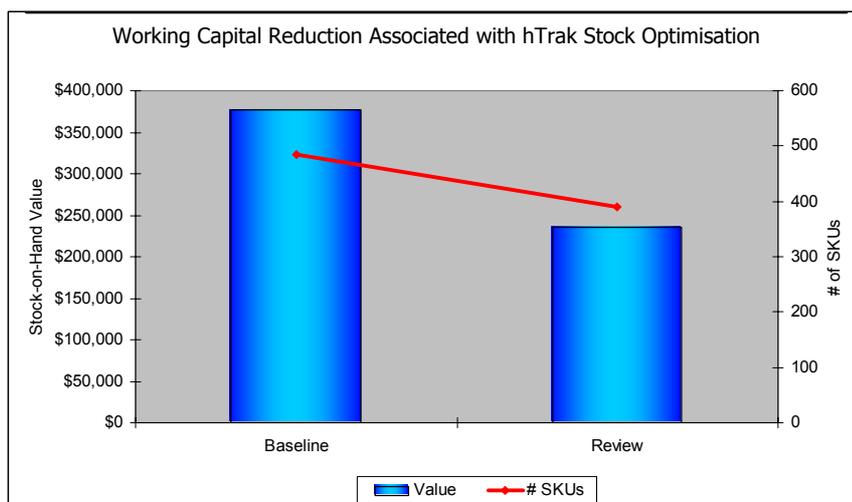
All suppliers reported either a positive or, at worst, neutral impact on their relationship with the Medical Imaging Department. Most expected that the time needed to be devoted to servicing the customer by the direct representatives had diminished significantly – and what time was spent was focused on more value-adding activities rather than checking stock.



Advantages & Disadvantages

- What are the advantages and disadvantages that you have experienced to date in using hTrak?

Advantages	Disadvantages
Use of standard item identification (UPN via EAN or HIBCC) and direct messaging eliminates most errors and speeds up the order to delivery process.	Concerned that customer service staff had inadequate training in dealing with orders received through hTrak.
Win-Win situation is possible for both suppliers and hospitals – both can improve productivity and accuracy plus revenue / profit opportunities.	Some issues in dealing with interfacing issues in some ERP systems – but believe it can be easily sorted out.
Although it started in one direction and ended up in a very different place it has enhanced its functionality offering dramatically and provides an excellent base	Some concerns about security issues still exist.
Aggregation of orders to unit of supply means orders are only placed at appropriate times – reducing the total number of transactions for both hospitals and suppliers.	A potential inventory management capability by hTrak was seen as a potential threat by some suppliers – installing a third party into the relationship between suppliers and hospital. ⁶
The by-passing of major data integrity issues at hospitals is a great bonus.	
Knowing the real numbers is of enormous benefit to everyone.	



Cost / Revenue Improvement

Working Capital Reduction

As stated earlier, inventory audits of the Medical Imaging cost centre were undertaken as part of both the Baseline and Review Studies. The graph shows the outcomes of the stock profiling activity that preceded the technology implementation.

It must be noted that

working capital reduction would have been further improved on that reported if the Medical Imaging Department had adopted a robust New Product Introduction / Product Deletion (NPI/PD) process. 79 new items were recorded in situ in the Review Inventory Audit – with no deletions beyond those resulting from the stock optimisation process conducted prior to the technology implementation. The hospital as a whole was provided with a RoadMap to achieve the implementation of this process however it was not adopted at Executive level.

The elimination of supply chain waste (obsolete – A\$30K, expired and damaged A\$13K and special needs A\$28K items) is a write-off in year one but will result in a recurrent saving of around 50% of total spend on wasted items (A\$35.5K) if a robust NPI/PD process is implemented. Excess stock (A\$127K) fed back into the system during the implementation period represents a one-off saving.

⁶ hTrak has no current inventory management capability.

hTrak Post-Pilot Review: The Alfred Medical Imaging Department



Schedule Five Rebate Improvement

Year-on-year rebate levels for Schedule Five claims on implantables improved by A\$30,000 in the first nine months of operation directly as a result of the implementation of hTrak. This is equivalent to an additional A\$40,000 of recurring benefit every year.

Systems

During the pilot stage it was expected that hTrak would have a major impact on the systems capability within the Medical Imaging Department – but, due to the fact that this department represents only a very small percentage of total sales for the suppliers involved, systems changes for suppliers as a result of the pilot would be virtually non-existent. This proved to be the case.

The Alfred

A comparison of system overlays from the Baseline and Review studies reveal the following:

Baseline	Review
Medical Imaging use stand-alone inventory control system, Omni-7 – not managed by any formal procedure or process, demonstrated poor data integrity and quality. Slow to respond, requires specialist knowledge to access.	No longer in use. Optimised stock profiling has provided a stop-gap measure for inventory management but system is required.
Medical Imaging unable to access core finance / inventory management system used in the hospital - Homer. This is an unsupported legacy system that is primarily used within Supply for purchase order and warehouse inventory management. Some depts have 'read-only' access. Data obtained from the system is difficult to manipulate and, based on observations and interviews with Supply and IS, has poor to very poor data integrity.	Oracle (government's selected replacement for current legacy system) lacks required functionality for inventory management at department level but will have purchasing capability. Data integrity issues likely to remain if pre-implementation data cleansing is not undertaken. Still no link or interface between Medical Imaging and Homer. Purchase transactions for suppliers / items on Standing Orders now partially automated.
The Supply Department also uses a stand-alone system – a dB created in MS Access to provide a reporting capability on "Non-Stock" requests.	Supply Department continuing to double handle all orders – through MS Access and Homer – have not asked for any hTrak reports.
No online reporting capability for any of the functions listed below: <ul style="list-style-type: none"> ✎ Schedule 5 Rebate items (manual or not done); ✎ Procedure Reports (manual or based on averages); ✎ Usage Reports (essentially non-existent). 	Reports available online or emailed on the following as a minimum: <ul style="list-style-type: none"> ✎ Product Traceability to Patient; ✎ Schedule 5 Rebate items; ✎ Procedure Reports; ✎ Usage Reports.

Suppliers

Suppliers who established e-commerce links using the aggregated replenishment data collected during patient procedures by hTrak reported that the volume of activity generated by the pilot was far too small for them to consider changing their systems infrastructure to accommodate receiving orders in a different way.

The major benefit for suppliers of hTrak in its current form and with its current customer base is simply that issues of data integrity that were previously experienced with pricing, item identification and unit of supply have now been dramatically reduced.

Without exception however all suppliers stated that they saw enormous potential systems benefits for both hospitals and suppliers as the take-up of the technology became more extensive. Among the many benefits they nominated were:



- ☞ **Reduced Transactional Volume & Cost.** The provision of a totally electronic ordering system generated at point-of-use and aggregated into re-order sizes before being submitted directly to supplier systems using the recently promulgated messaging standards for health supply chains would eliminate significant amounts of authorization, data entry and checking activity that happens using current systems and associated processes;
- ☞ **Improved Forecasting & Market Understanding.** Forecasting – even to seasonal levels – could be at least partially automated using the data capture enabled by the system. This could be done on a whole market basis by item category for the purposes of health sector budgeting – and on a hospital or supplier basis for planning purposes;
- ☞ **Benchmarking.** Capturing procedure-related information and sharing that between hospitals, suppliers and potentially other stakeholders (government, insurance providers) would offer opportunities to gain an improved understanding of various procedures, to benchmark outcomes and methodologies;
- ☞ **Production Scheduling Links.** Some suppliers saw that the point-of-use information could be used beyond forecasting into actual production scheduling. Given the nature of the Australian market this is likely to be useful for Australian-based manufacturing only at this time but, with a rollout of the technology on a global basis, offers such opportunities;
- ☞ **Reduced Inventory Holdings.** Suppliers currently report needing to hold a broad range of items in greater levels than necessary if their customer demands are to be satisfied. Access to point-of-use information from customers, following on from the stock optimisation process that forms part of the hTrak implementation regime, would enable suppliers to rationalise the number of items they need to stock – and to reduce their total inventory holding in respect of customers using hTrak.



Qualitative Analysis

Staff in the Alfred's Medical Imaging Department have generally embraced and adapted to the new system. Interviews conducted resulted in some of the following comments and feedback:

- ✧ "We would never want to go back to the situation we had before – this system gives us complete, timely and accurate information about almost everything we need to know concerning resource usage, re-ordering and tracking things to a patient."
- ✧ "This system would not have got off the ground if we did not have the backing and support of our Supply Management"
- ✧ "It is great for costing consumables to a patient's procedure."
- ✧ "When the UPN is recognized by the scanner, it is a much quicker way to order."
- ✧ "While there are areas where the technology could improve, at this point it has provided us with a fantastic first-step to doing things we could never do before."
- ✧ "Once I got used to using the handheld, I had no problems with it."
- ✧ "The implementation was great – they dealt with all our issues and kept us informed – once we had been using it for a while we worked with hTrak to develop improvements, they have been extremely responsive to our needs – although some things will take a while to deliver."
- ✧ "The difference in our department has been amazing."

Within the Supply Department the reception has been generally positive – although the problems with receipting did cause some grumbling:

- ✧ "...the Contract staff have been very keenly putting it (the Standing Orders) together..."
- ✧ "Management have had no queries despite the up-front commitment on expenditure that is required."
- ✧ "Ultimately it will cut out a swag of activity, the accuracy is excellent, it allows us to focus on things that have greater priority because of the reduction in standard workload."
- ✧ "Logically – over time – we should be able to start pulling catalogues down from suppliers rather than attempting to maintain our own."
- ✧ "There has been a lot of work in getting everything aligned – but we are now engaging directly with suppliers and we are all benefiting from that."

Suppliers similarly had praise for the system – again, despite the time it took to get things up and running:

- ✧ "I'm really excited about the prospects for consignment stock management – it reduces workload in the hospital, leads to efficiencies our end and the integrity is great."
- ✧ "...can only benefit everybody...uses real numbers to justify real positions..."
- ✧ "...when it encompasses whole hospitals, there will be large savings on both sides...we need to get it set up and running for as many sites as possible..."
- ✧ "...enhances our ability to plan and forecast immensely..."
- ✧ "hTrak brings science to the process of re-ordering, rather than relying on many individuals throughout the chain to remember everything, never make an error and get it right."



Concerns & Opportunities

A number of concerns were raised with Ithaca during the post-implementation review – in almost the same breath many respondents stated that the concern had been dealt with through a further development of the technology or process. Other concerns were more focused on ways in which they would like to see the technology develop – these have been treated more as opportunities.

Security

Some suppliers were concerned with the security of their information in an ASP environment and in moving to the acceptance of direct messaging that potentially generated activity in their internal systems. Our findings were:

- ✧ Ithaca's research on the hTrak system showed that every step possible is being taken to ensure information is only accessible to authorised viewers using a telco grade facility for the web server environment and 128 bit encryption – although even more advanced encryption technology is being developed. ASP services are still in their infancy in many respects and clearly their efficacy in this regard needs to be proven to users. Ithaca believes this confidence will come with time.
- ✧ Despite many claims that organisations are 'ready' to engage electronically with each other 'at the drop of a hat' the hTrak implementation proved definitively that there is considerably more work involved. Yes, there are now standards for messaging and data sets within the health supply chain – but the acceptance of messages that generate activity in the systems of other organisations has little to do with standards or technology of any sort. The issue here is trust and that will only be generated by the development of strong relationships between supply chain parties wanting to share information.

A Third Party in the Hospital – Supplier Relationship

There was also concern that hTrak would become a third party, potentially interfering in the critical relationship between hospitals and suppliers. There was particularly a belief on the part of some that inventory management services offered by hTrak would be destructive in this area. Our findings were:

- ✧ hTrak does not provide an inventory management capability – it provides a data collection tool. The information / data collected can then be used by hospitals and suppliers in the ways described throughout this document.
- ✧ One way in which the data collected by hTrak can be used is through feeding it into an inventory management program or process – something that hospitals see as value-adding since there is zero visibility of stock within most hospitals once outside the warehouse.

Whilst hTrak sees this as a potential area where another party could provide a service that currently does not exist (concurrently eliminating the massive replication of expensive effort on the part of suppliers in managing consignment stock), they believe such a service must be completely transparent to the parties involved and provide benefits to all parties.

'Scanability', Standards Adoption & Standing Orders

Problems arose in Medical Imaging when bar-codes could not be read⁷. In addition there were some issues where UPNs were replicated (same product, different manufacturing centre). This, together with data matching and integrity, were the core reasons for the extended time it took for organisations participating in the pilot to get to a point where information could be exchanged with confidence.

⁷ Instances occurred where the bar-codes on products did not comply with the standard (HIBCC or EAN) requirements, other reasons why bar-code readability fails include creases, poor print quality or definition, colour used and the surface on which printing occurs

hTrak Post-Pilot Review: The Alfred Medical Imaging Department



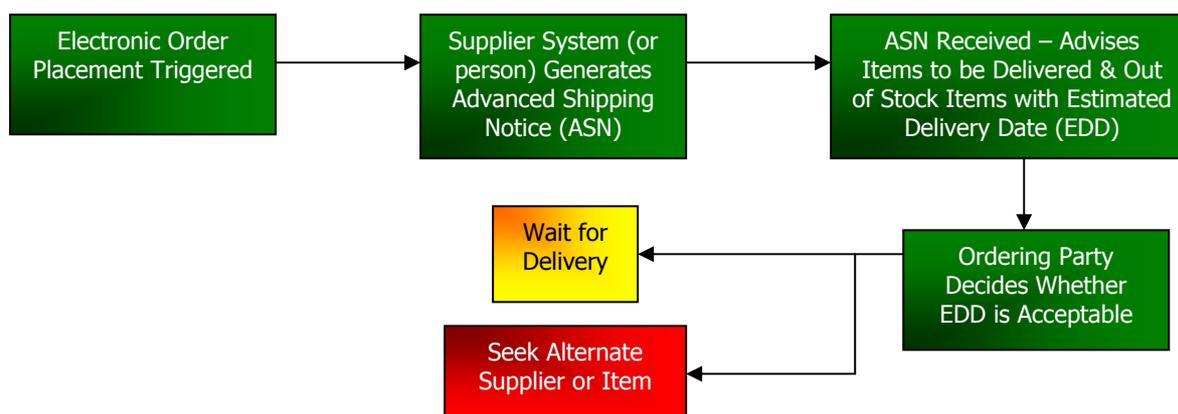
Ithaca's research plus feedback sought from HIBCC and EAN as well as parties to the hTrak pilot suggest the following scenario / opportunity exists:

- As suggested in the Baseline Study – and demonstrated in other industries – hospitals need to assert their position in the marketplace by demanding that all suppliers comply with the requisite product identification standards. This identification must be applied to single items, inner and outer containers and, where appropriate, pallets and containers. It must be part of the contract or Service Level Agreement (SLA).
- Any failure to comply with the readability requirements of the standard should then be reported by the hospital to both the supplier and their standards organisation.
- The Alfred, through requiring ASNs from some suppliers as part of the hTrak pilot, has taken the first steps along this road – but there is further to travel before a seamless supply chain is in place, supported by robust product identification for all items.

The above steps will drive suppliers toward the adoption of standards – and to developing their own systems to take advantage of the benefits on offer.

Back Orders & Receipting

Management of back orders appears to be something for which a process is lacking in the current implementation. Whilst the capability exists to institute a streamlined back order management system as follows...



...such a process has not been instituted with the result that each functional area within the chain believes that the management of back orders is being done by one of the other parties. hTrak provides the information that makes this process more easily manageable but a process must be developed and adhered to for it to work. A relatively simple fix would be for suppliers to advise cumulative totals of backorder items on each ASN.

A receipting function within hTrak would further enhance back order management capabilities however other aspects – such as picking slips, delivery slips etc are more in line with ASN and standards adherence requirements that must be placed on suppliers and using an inventory management tool within Medical Imaging.

Interfaces & Information (Reports)

At this point there is no interface between hTrak and The Alfred's financial management system – although the hTrak data can be imported in a variety of ways that comply with Australian Standard formats for this purpose. The hospital system is scheduled for replacement by Oracle in the relatively near future. Ithaca recommends that hTrak engage in discussions with Oracle to determine opportunities to develop at least import/export channels between hTrak and Oracle's financial management system using health messaging standards.

hTrak Post-Pilot Review: The Alfred Medical Imaging Department



The functionality of Oracle will not allow for the level of inventory management being sought in this context, nor will it support the operational reports available from hTrak. The key reason for an interface is the transfer of financial information. Best-of-breed systems should still be relied upon to collect the data (hTrak) and manage inventory (other system) at multiple levels.

Opportunities to link to the Patient Administrative System via HL7 standard communication should be investigated from a similar viewpoint to improve the ease of raising Schedule 5 rebates.

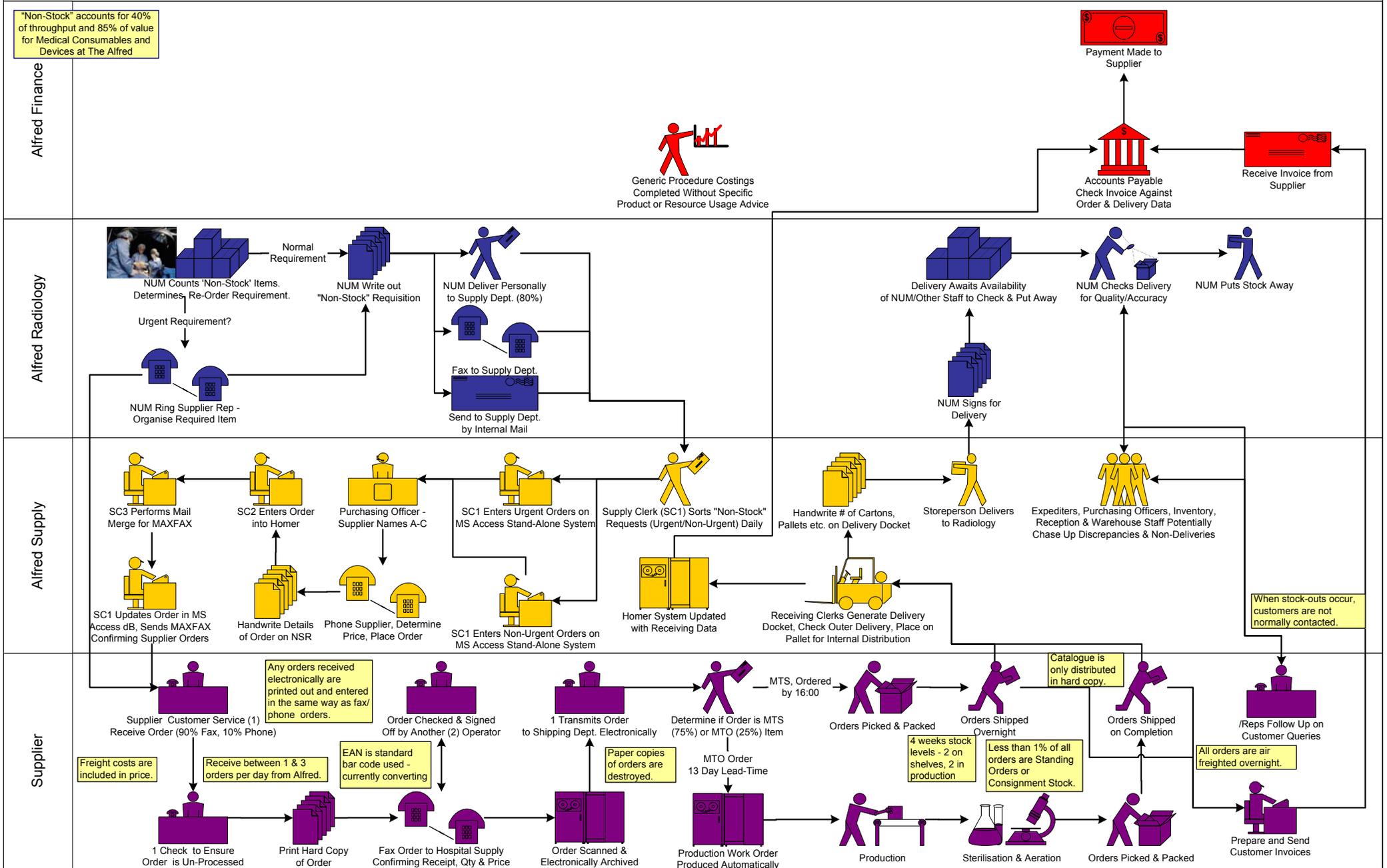
There is also a need to record the patient's UR number to facilitate more information appearing in the Procedure Report. This will further enhance the impact of hTrak on the overall ability to impact CaseMix and DRG compilation in the procedure costing area.

Automation

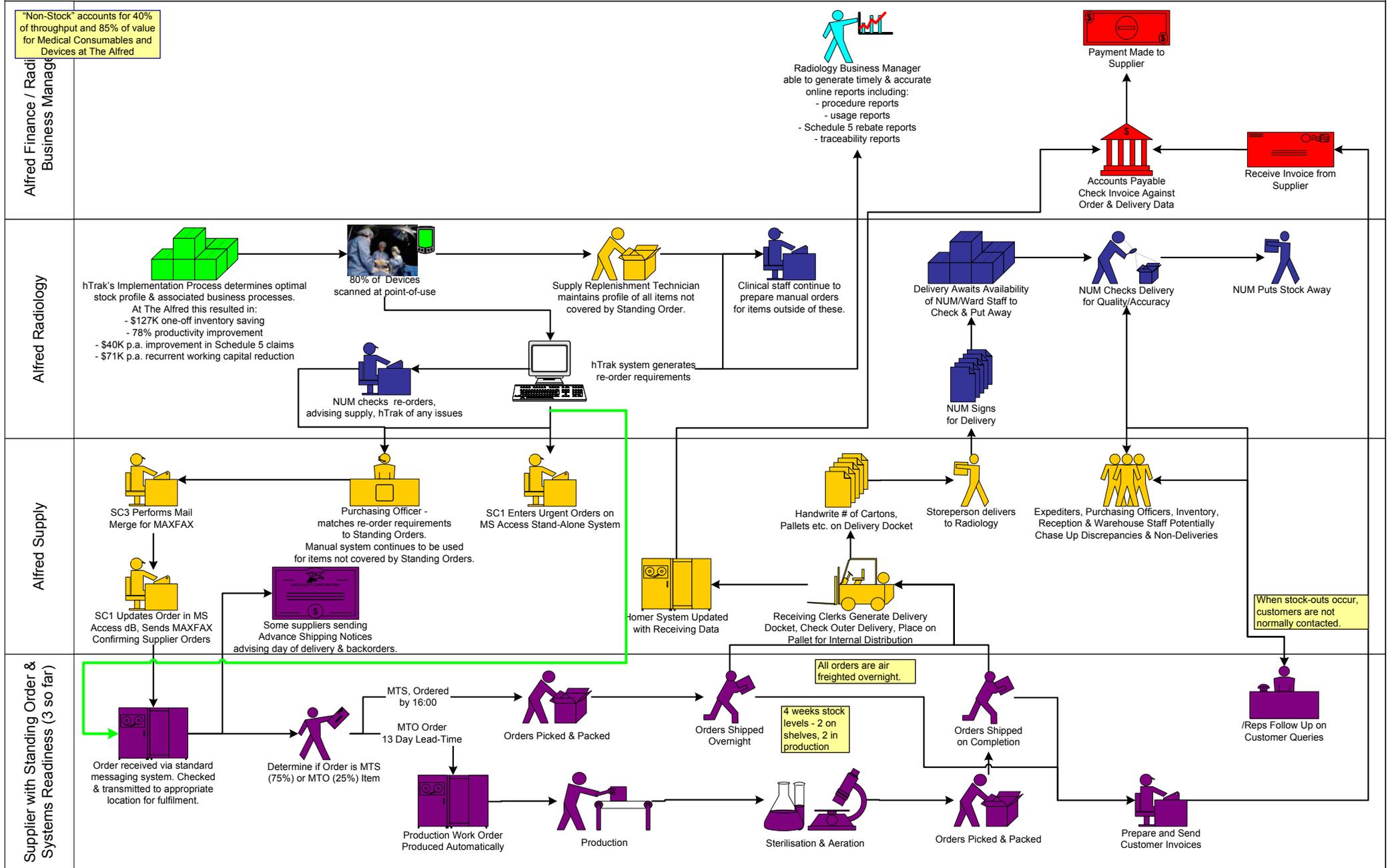
hTrak currently supports a partial automation of the supply chain – whilst providing timely and accurate information on resource usage that has never been available before. Parties to the pilot have put in significant time and effort to get to this point – but it is possible to move to a fully automated operation that relies on exception reporting to manage any anomalies with normal replenishment.

Ithaca believes that full automation is possible but will also require parties to develop stronger relationships at different levels to those that may have existed in the past. Customer service will occur between IT and Supply departments as much as between Sales Reps and Clinicians. Trust will need to develop in terms of confidence in systems as well as product; positions of power will need to be re-negotiated.

Baseline "Non-Stock" Replenishment Process - Alfred Radiology & Supplier/Manufacturer



Pilot "Non-Stock" Replenishment Process - Alfred Radiology & Supplier/Manufacturer - Further Opportunities Supported



Optimal "Non-Stock" Replenishment Process - Alfred Radiology & Supplier/Manufacturer - Further Opportunities Supported

