

# Fish bone diagram from a case study essay



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Collaboration in business process re-engineering: purchasing and supplies  
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 UK St James's University Hospital in Leeds is one of the biggest teaching  
 hospitals in Europe and one of the largest acute service units in the UK  
 National Health Service (NHS). Granted 'trust status' in April 1991, it  
 employs over 5000 people and sees 450,000 patients a year (see Industry  
 Note in Appendix 22.1). Operating income from the internal market  
 totalled ? 125.8 million (1993-4) with 70% of the income coming from the  
 contract with Leeds Healthcare.

For 1994-5 the Trust has negotiated contracts with 12 health authorities and  
 130 general practitioner (GP) fundholders. St James's provides services both  
 locally and to the wider Yorkshire community against the background of  
 national, regional and local objectives and priorities required to meet the  
 ever-changing demand on services. In spite of increases in activity by the  
 hospital, admissions and waiting lists are increasing, reflecting this  
 increasing demand (Table 22.1). Table 22.1 Admissions 1991-2 In-patient  
 Day cases Acute Waiting list Total 1992-3 17,198 21,893 37,793 8723 76,  
 884 993-4 15,641 27,237 39,490 8820 82,368 17,444 16,136 36,459 70,  
 039 Health authorities want the best value for money service, best use of  
 resources, and high patient throughput. In addition, the government wanted  
 2% more activity in the financial year 1994-5 plus a 1% cost-improvement  
 programme. In view of the constraints and demands placed on the hospital  
 and their commitment to improving both quality and value for money, St  
 James's began an innovative collaboration in 1991 with Lucas Engineering  
 Systems Ltd (LES), the aerospace and automotive group.

Initial contact between the two organizations was made during a working party on electronic data interchange and the NHS. A member of St James's supplies staff encountered work done by LES, who were keen to investigate the transferability to the public sector of some of the techniques that have led to increased efficiency in car manufacturing plants. Lucas, a leader in such systems, had developed their methodologies during their restructuring in the late 1980s and were now looking beyond the manufacturing sector.

After an initial meeting, good working relations were established and possibilities were discussed of transferring the methods used in industry to within the hospital organization in order to improve the efficiency of working processes. LES gave a presentation to St James's at board level. This overview was not project specific, but did interest the board enough for LES to be invited back to hold a two-day workshop for senior hospital managers. This would investigate possible areas for collaboration using the Lucas approach to the management of change, involving business process redesign (BPR).

The aims were:

- to review LES redesign methodologies
- to discuss whether and how these principles could be applied to specific change projects at St James's and/or complement current initiatives
- to discuss relevant case examples of the application of the methodologies in order to identify tangible benefits
- to make specific decisions on how to progress the change programme.

Following the workshop, the board gave the go-ahead for work with LES and proposals for possible projects were invited from within the hospital.

Careful selection was necessary since there had to be an element of cost saving to pay for the project, which would hopefully go on to generate revenue for St James's. There were also issues surrounding trust status (management changes); the Patient's Charter (performance measurement); and customer care (quality) to consider. Selection criteria were developed based around the need to choose something with a good chance of success, which would test the thesis that these systems could be transferred from industry, and which was health related and financially viable.

It did not take long for a number of potential projects meeting the required criteria to be identified. Both partners were learning from each other and whilst in most areas it appeared that manufacturing techniques for process change could be transferred, it was becoming apparent that there were to some extent a 'separate set of rules' for the NHS. This was because of the nature of the organization, internal and external constraints and the pace, extent and speed of change. Two projects were identified with different objectives.

A reorganization of the purchasing and supplies function would hopefully meet the cost-saving requirement, whilst a reappraisal of the admission procedure was more of a cross-functional experiment, but both involved systems investigation and a process approach. Thus the final decision was: • Project A: elective admissions • Project B: non-pharmaceutical supplies - purchasing and supplies. This case will examine the design and implementation of Project B. Two groups of hospital staff were selected (on voluntary secondment) to work full-time on both projects.

It was made clear early on what the starting base was, what the aims were and why they were doing it. The projects began with one week's off-site training, in order for LES to familiarize St James's staff with the theories and methodologies to be used and for the teams to look at time scales and deadlines. Both teams would have weekly progress meetings with their managers, plus presentations on findings and monthly meetings with the hospital's director of organizational development.

Producing the hospital's application for trust status acted as a catalyst for many changes and part of this involved spelling out how much and how far medical staff would become involved in hospital management. The 15 clinical directorates (similar to business units) evolved from this and covered all aspects of clinical activity at the hospital. They are headed by clinicians with day-to-day management undertaken by full-time operations managers (see the organizational chart in Appendix 22. 2. ) Following project selection and staff training, specific process issues were refined in discussion with clinical directors.

However, it is important to remember that St James's went into the exercise knowing what the particular process problems were but not knowing what the outcomes would be or how the process of change would evolve. Both projects represented a potential risk with large investments committed in time, money and people - and the hard work was just beginning. Project B: non-pharmaceutical supplies The objectives for the purchasing and supplies project were quite clear - they were to repeat the success that LES had achieved elsewhere in similar circumstances.

It was felt that the methods-used in this area were more easily transferable from the manufacturing sector. Objectives Although the aims were defined, the team did not know what the end result would be. They had, however, identified objectives and a structure to work within in order to look at the purchasing process:

- to reduce the costs of operating the purchasing system
- to improve the availability and response of the delivery of materials to the point of use (wards, etc.
- to decrease lead times within the system (and therefore stocks held)
- to reduce the number of suppliers and product costs
- to rationalize product variety
- to make enough money to pay for the project and eventually make cost savings.

Background Historically St James's supplies function had evolved with little planned growth; things continued to be done in the way that they had always been done and were geared towards saving money. In 1991 supplies was devolved down to operating units, essentially three supply teams, to cover St James, Seacroft and the Community Hospital.

This arrangement was confirmed by the Audit Commission Report in 1991, which set up the NHS Supplies Authority (NHSSA). The NHSSA was able to buy in bulk at the lowest prices and it operated on three levels: national, divisional and local. St James's supplies were on the local level. In 1991 St James's took the option open to first-wave trusts to retain the right to have their supplies staff employed directly by the trust, instead of by the NHSSA, but they could still use the NHSSA as a supplier and warehousing facility.

The benefits of this were that:

- St James could retain and pay their own supplies staff
- it allowed them to purchase direct from the best supplier
- it gave them the ability to gain on economies of scale (as NHSSA gave no

reductions for bulk purchases which gave St James no advantage for size) • they had identified high on-costs with the NHSSA service (some items were on national contract to the health service and they would pay the NHS contract price plus approximately 10% on-costs, with no room for negotiation). The supplies manager had a fairly new supplies team consisting of 24 people and he already wanted to implement changes to the system, to improve the quality of the service provided and reduce costs if possible, but not at the expense of quality. He wanted to concentrate on value for money and was looking for a way to do this, but he had to make changes whilst keeping everything running, which was a very difficult task. Collaboration with LES would facilitate this but with the advantage of it being on a structured basis, within a formal project and with the benefit of advice and support from Lucas.

A project team was set up in a separate room, physically remote from the supplies department and consisting of the supplies manager, a charge nurse from coronary care (who wanted to move into management), and two Lucas engineers. These four people were taken out of their full-time posts for a period of three months, a considerable investment in time and resources. The supplies manager brought expertise from the department itself and a background in finance whilst the charge nurse had technical knowledge from the customers' perspective (customers being departments, wards, clinicians and nurses - the end users of the purchases).

The LES engineers brought project management knowledge and methodologies plus the enthusiasm to transfer what were essentially manufacturing techniques into the public sector. Following their off-site

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training they worked within a three-phase process: diagnosis, design and implementation. Phase One was to identify workable objectives, outline proposals and, in the case of the supplies project, work on areas for savings. Phase Two was analysing and proving that it could be done and Phase Three was implementing the necessary systems.

At the end of each phase, board approval was necessary before the team could move on. Phase One: diagnosis The fully computerized order system showed that St James's currently purchased over 14, 000 product lines from more than 1600 different suppliers. Problems soon became apparent: • • • •

- too many too many too many too much too much products - they were not buying effectively suppliers people interfering in the purchasing system information in the system inventory. LES's expertise helped to isolate possible areas to tackle.

They initially looked at high spend areas and identified selected product ranges for further investigation. Within the 15 clinical directorates each ward or department had its own budget. Previously, each one ordered whatever they wanted from supplies as it was needed. Storage was on an ad hoc basis in individual wards, with stock being spread over many areas, leading to duplicate orders and overstocking for many items. This decentralized purchasing system had simply evolved over time and every budget holder had the freedom to spend within their budgets, i. . medical representatives would sell to individual ward sisters. As a result, single items (e. g. syringes) had many different suppliers and the main function of Supplies had been to process all orders raised by all budget holders, on as many as 10-12 different requisition systems (depending on what was being ordered). Thus, the main

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problem to be addressed was how to stop people having the freedom to choose which products and which suppliers to use. At this stage the team had a problem.

Having done the analysis and identified the problem, they had to look for a mechanism which would take into account the needs of directorates, individual budget holders and the supplies function and at the same time be transferable for all purchases (old and new). That would be the task of Phase Two. At the end of Phase One the recommendations were:

- to reduce the product range and the supplier base, therefore ultimately reducing purchasing costs
- to alter the system of providing goods to wards and departments (storage, delivery, etc.)
- to review the ordering system and processes within the supplies function itself.

These recommendations were accepted and the team moved on to Phase Two- verifying the benefits and designing solutions. These two phases will be considered together, as once the recommendations were proven to be necessary and/or desirable, implementation was the next logical step and followed quickly. The following three areas had been identified as requiring new systems, and process design and the next task was to set about proving the need to change the status quo, e. g. (a) Reducing the product range and supplier base would reduce costs. (b) (c) That altering the system of ordering, delivery and storage of goods for wards and departments was desirable and/or necessary. Following on from (b), a review of processes was needed within the supplies function in order to implement these changes - a move to materials management. A. Reducing products and suppliers The team began by choosing four or five different product ranges and

concentrating on a few high-spend departments, e. g. X-ray, renal unit, anaesthetics. Main products and suppliers were analysed and data gathered, e. g. the hospital was purchasing 18 kinds of disposable gloves, from disposable plastic costing 50p per 100 to surgeons' gloves costing several pounds per pair.

A member of the team did a breakdown of where and when the different types were used, spoke to different departments and users, looked at suppliers and arranged trials. The need for some variety was accepted and in the end three types of gloves were decided on: sterile examination gloves, non-sterile and surgeons'. None of these was the cheapest on the market but they were thought to be the best value for money. Thus, the link between reducing suppliers and costs was shown by looking at such specific examples. The team also investigated possible savings gained by rationalizing suppliers, e. . anaesthetics bought six perishable items for anaesthetics machines (tubing, etc. ) from six different suppliers at a cost of ? 45, 000 per year. In Lucas's manufacturing experience if all products could be sourced from a single supplier, then considerable discounts could be negotiated, but was this transferable to the hospital? The team visited all six suppliers and found that each one could provide all six items! One was chosen, discounts were negotiated and all the items were delivered at the same time in a single drop operation with a saving of ? 3, 000 per year. The director of pharmacy and supplies used a drug audit group for the selection of pharmaceutical supplies and this model became one of the recommendations of the project team for the selection of non-pharmaceutical products. The chief executive officer (CEO) and the board

accepted this and authorized the formation of a product selection group (PSG). This would be chaired by a consultant and include representatives invited from the clinical directorates, technical specialities (e. g. physics, pathology) and finance, with a total of 10-15 members.

Meeting monthly, their brief was to examine the whole range of non-pharmaceutical supplies (the 14, 000-plus products currently in use), group them together and rationalize, giving recommendations on the best value for money items. They would then have the mandate to impose their recommendations hospitalwide. For example, they decided that only three types of gloves identified during project analysis could be ordered, although exceptions could be made if a purchaser could demonstrate a special or even one-off need for a product, which would in turn be examined by the PSG.

B. Storage and delivery system to wards and departments The team examined what was actually being ordered and put the products into three categories (again borrowed from manufacturing): runners (stock items used all the time), repeaters (items used occasionally, with known suppliers), strangers (new items, which could be one-offs). All items ordered by budget holders were put into these three categories (using the computer order data) and patterns for each ward or department were analysed.

The existing system was that each ward would decide what it needed and place a requisition through to supplies. If it was a stock item, an order would be placed accordingly and the items obtained mainly from NHSSA; if not, an individual order would be raised to a specific supplier: how it was ordered

depended on what it was. A procurement system was needed which should be designed around the three groups, runners, repeaters and strangers, and which would eliminate the ward sister's involvement with stock levels.

The recommendation was for a materials management system to be introduced, which would eventually be hospital-wide, controlled by the supplies function. The old order system had resulted in fragmented stockholding, vast overstocking and bad use of storage space on wards. The need was for purpose-built, high-density storage and LES recommended a Kanban system of continual replenishment; this is based on the Japanese storage-bin replenishment system, where stock is ordered as it is used. The team found haphazard storage on wards and ? 200, 000 worth of overstocking, this was money tied up in inventory.

Once identified, the solution was to stop orders being . placed for the next three months to use up the overstocking. With the money freed in this way, each ward invested in high-density shelving and converted the main store-room to an effective storage system. A major problem was to prevent people wanting to hold large quantities of inventory ' just in case'. The materials management system was first introduced to one floor of Gledhow wing; this proved very effective and soon afterwards . all wards in this wing had their stock managed by supplies.

C. Reorganization of the supplies function itself There had been 24 people in the existing supplies function, seven or eight of whom were buyers processing orders from budget holders, supported by the computer system. The purchasing department itself was reorganized to accommodate the

changes necessary to move to a materials management system (but they too had their own budget constraints). Fewer requisitions and orders should reduce the buyers' workload; all staff were interviewed and some became materials managers with different responsibilities.

New roles entailed close liaison with budget holders on the wards and departments to set appropriate initial stock and reorder levels for all items. In addition, weekly visits were made to the wards to check stock levels and reorder as necessary around the three category groups; runners were ordered weekly; repeaters, with known sources, were ordered less often, possibly three or six monthly; and strangers were slightly different. Since these are non-stock items (e. g. furniture or items for special patients) they were ordered only when required, and this could still be done by the budget holders.

Within the supplies function, buyers had previously been organized around budget holders, e. g. one dealing with X-ray purchases. Following rationalization of the product range and suppliers, LES recommended that after the move to materials management the remaining buyers should develop their expertise around product groups. This was implemented and is shown in Appendix 22. 3. The new system was quite a change for personnel. Budget holders no longer placed orders (except for one-offs); they could still see the sales representative and request the purchase of new items but this would go before the PSG.

They no longer had responsibility for overseeing stock levels on wards and money was not tied up in inventory as before. Staff could always be sure

where to find stock, and goods should be in the store room bins as required and replaced as used. Some saw this as a freedom from tiresome administration, others as a loss of power. Supplies staff were given new responsibilities, and materials managers took direct responsibility for ordering, stocking and delivering to wards as and when needed, as well as the initial negotiating of stock levels.

Buyers soon developed expertise in specific product areas and built relationships with fewer suppliers. NHSSA and suppliers became the central stores function, with stores at the hospital responsible only for the receipt of goods and distribution to wards and departments on arrival, usually in ward boxes. This BPR project was a success for the hospital and has resulted in considerable cost savings. The CEO required that this project should ultimately pay for the BPR project collaboration with LES, and this has been done.

Future savings on product rationalization will benefit the hospital directly. The project team and the PSG continue to monitor all product orders and the emphasis is on value for money with the most appropriate product, not necessarily the cheapest, being used for quality, safety and customer satisfaction. . Summary of achievements from supplies project The supplies project team met its aims and achieved the following. • It established mechanisms to review current suppliers and product range. • It removed some suppliers and products from use. It reduced stockholding inventory at ward level and transferred funds to buy a ' custom' storage system. • It created materials managers within the supplies and purchasing department, who developed improved relationships with their suppliers. • It established

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mechanisms for assessing new products and controlling the introduction of new products - PSG. • It established 'technical' support for supplies. At the time of writing, the new materials management system was almost hospital-wide and continuing to make savings.

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Many profitable state industries were privatized whilst a new strategy was adopted for public sector services (previously run around the welfare ethos) based on the creation of 'internal markets'; budgetary devolution and competitive tendering (internal and external). These new markets are best illustrated by the health and education sectors and the UK public sector is now characterized by 'a competitive contract system and devolved responsibility for performance at individual business unit level (e. g. hospital, health authority, school).

The State remains the primary source of funding, thus the UK government gives local/regional health authorities funds to purchase or commission health care on behalf of their population. Health authorities then commission hospitals or trusts to fulfil a series of contracts, delivering set amounts of

operations and admissions over a given time, e. g. in 1993 St James's was contracted by Leeds Health Authority to provide 4695 in-patient episodes of general surgery, a set number of maternity deliveries, etc. Local health authorities (LHAs) are the customers, and patients are seen both as customers and as the ' products' of the system.

The waiting list represents the order book and the objective is ' order fulfilment', a successful admission and operation for patients, giving customer satisfaction and fulfilling contractual obligations for the LHA.

Therefore, since processes influence the order book, if they are not carried out correctly or efficiently, people could buy the ' product' elsewhere. The hospital needs to ensure that its processes are as effective as possible so that all customers (general practitioners, health authorities and patients) are happy with the product.

It is important to remember this background, especially the funding implications (which are fairly new to the NHS) when considering this case. The modern NHS, like all other businesses, has many financial constraints including income generation, budget performance, and return on assets and contract targets (Appendix 22. 2). It must also strike a balance between its customers and other stakeholders. Over the past four years the organization has had to undergo major changes in moving towards market orientation.

The project outlined in this case fits more easily into this culture, since the hospital still needs to be able to gather and collate information for contracts and costs, which would be impossible if the central functions were dismantled. Projects such as A, if it were extended, would fragment the



organization and information for purchasers, patients and LHAs would be spread over as many as 15 directorates. This was not a potential problem for Project B and may have contributed to its success. Appendix 22. 2: St James's University Hospital Trust corporate management structure, July 1994

Trust board chairman Acting chairman Chief executive

I Director of business planning & information (Deputy chief executive)

Director of finance I Clinical directors I Director of personnel I Chief nursing officer I Medical director Director of operations I Director of information services Director of information technology I ~ Operations managers (see below) I I Director of pharmacy services & supplies I Director of hospital support services Director of estates Accident & emergency Anaesthetics Children's services Elderly services General medicine General surgery Intensive care Orthopaedic surgery Pathology Radiology Renal services Plastic surgery Special surgery Theatres Women's services

Children's services Elderly services General surgery Medical services

Operating theatres Renal services Special surgical services Women's

services Existing supplies structure Ultimate supplies structure \_\_\_ 1\_\_ - ~'"-

Capital equip. Store buyer Store manager Customer care Capital equip.

Storekeeper Storekeeper \_\_\_\_\_ Buy I Organised around budget holders Buy

Buy Buy Buy Organised around budget holders — r-h Store- Storekeeper

keeper Storekeeper Senior buyer Materials manager II~I~III Clerical support

Data input Cust. care Cust. care MM. MM. MM. MM. MM. MM. I I ~ MM. MM.

MM. I I I I I I I I

Who order all items they require through: I Supplies department I Which raises purchase orders on any of its 1600 supplier companies Receives goods from suppliers and arranges delivery to Where goods are stored in a variety of locations RESULT? Overstocking, obsolete/time-expired inventory, money tied up in excess inventory, stockouts, bartering/exchange between wards - agree on which products can be ordered - set levels for storage and re-order (all items) RESULT? Continuous replenishment of goods according to use means low inventory levels, few stockouts. Preferred suppliers means lower unit costs of supplied goods