

Operations management applied to diabetes services

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ARTICLE POINTS

1 Operations management is a module studied as part of the MBA (Masters in Business Administration).

2 It provides a useful way of assessing the way a service works, and identifying areas of success and areas of improvement.

3 Operations management allowed comparison of a diabetes service before and after change.

4 System A (*Figure 3*) demonstrates a typical hospital lay out, with various departments being used to provide diabetes care.

5 System B (*Figure 4*) demonstrates diabetes care located within a diabetes centre.

KEY WORDS

- Operations management
- Transformation processes
- Operations profile
- Layout and flow

Introduction

An operation is the process by which a product or service is transformed into another product or service. Inputs can be people, information and/or resources. At a diabetes clinic, the outcome is greater knowledge on behalf of clients, from which they can make informed choices regarding their diabetes management. This article applies operations management theory to two diabetes services, one of which recently replaced the other at a Trust in West Sussex. The service design, transformation process, layout, flow, location, appearance, design, facilities and technology of the two services are compared.

The link between operations management and diabetes services, or diabetes specialist nursing, may not be immediately apparent to all. To many people, operations management is concerned with industry or manufacturing, whereas in reality, it has much more common applications. As explained below, the organisation of diabetes care is just one application.

A general model, applicable to all operations, is shown in Figure 1. In simple terms, an operation will have various input resources, e.g. people and information. These are then transformed, or transform something else, into the finished product or service.

Diabetes care context

At a simplistic level, operations management is applied to diabetes care as follows. At the diabetes clinic, clients are given information that transforms their understanding of their diabetes. The output or outcome is that clients have greater knowledge, from which to make informed choices regarding their self-management.

Two diabetes services

Two diabetes care operations are compared below: system B replaced system A at Worthing Hospital NHS Trust in 1999. In system A, care was provided from various hospital departments. System B is a total care system provided from a diabetes centre.

Both systems are typical of current diabetes care provision in the UK. Within a particular

trust, the priority given to diabetes, as well as funding and space available, seems to determine which system is in place.

In developing system B, the diabetes team reflected on the costs and benefits of system A. Potential areas for improvement were identified and given a priority rating.

A 2-year consultative period enabled ownership, generated a wide range of good ideas — more than a few senior people could possibly have had — and positively contributed to team dynamics and motivation (Rosenfield and Wilson, 1999). The following aspects of the centre were considered:

- Layout. This was important because space was limited
- Furniture
- Facilities
- Feel of the environment.

The Trust allocated space for the diabetes centre after five years negotiations with the diabetes team. The space became available when services were moved to an extra wing which was added to the hospital. The centre cost £350,000, and was jointly funded by the hospital League of Friends and the diabetes team through fundraising efforts. The Trust further contributed by employing a fundraiser for six months to co-ordinate the process.

Diabetes team and the DSN role

Specialist diabetes care has traditionally been provided in secondary care, usually in an acute hospital outpatient setting. A variety of healthcare professionals are

involved in the delivery of this care including diabetes consultants, diabetes specialist nurses (DSNs), dietitians, chiropodists, and specialist paediatric and obstetric teams.

The senior DSN at the Trust has many roles:

- A human resources function — managing and developing four part-time DSNs, secretaries and a receptionist
- Management of physical resources, i.e. the diabetes centre
- Budgeting for equipment, supplies, and conference attendances. However, the financial function does not include staff salaries
- A marketing function. This entails promoting the diabetes service and DSNs to internal and external customers, and involving colleagues in marketing strategies
- Facilitation and management of service development, involving the diabetes team
- An operations function — management of human, physical and information resources to enable the provision of quality diabetes care.

Performance objectives

Both systems have the same performance objectives, imposed by the Trust and the Government. Because there is a separate equipment budget, the most important objective is cost, essentially staffing costs. All service development has to be planned within current staffing levels, which invariably means swapping one activity for another.

Speed of service delivery is less important to the Trust. This is because the waiting lists are medical and, unlike surgical lists, there are no financial penalties incurred by failure to meet Government targets. Urgent referrals, which call for flexibility in changing the focus of nursing resources, are always accommodated.

Dependability is evident from the planned clinics, which are not cancelled, the manned hotline, and the consistency of the information content and manner in which it is delivered.

Quality, however, has only been measured superficially in system A, and not at all in system B. Both systems met the standards of *The Patient’s Charter*. Apart from the Charter, there is not a standard measurement tool in use at the Trust.

Service design

Systems A and B use the same concept and package in design, but there are differences in how the service is delivered. System B can be viewed as a development of system A, with desired process improvements.

The service concept is twofold:

- Communicating research-based nursing and medical information to clients to improve health outcomes by reducing complication risks, and thereby improving quality of life.
- Sharing information with clients’ healthcare professionals (hospital and community nursing and medical staff) to achieve the same ends.

The elements of the package include:

- Resources (equipment and human)
- Specialist diabetes skills of the diabetes team
- Information, both written and verbal
- Infrastructure to manage this information exchange
- Physical location.

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1 The operations function contributes to service or product advantage through five performance objectives.

2 These are quality, speed, flexibility, cost and dependability.

3 Dependability means delivering the service on time, on the right day etc.

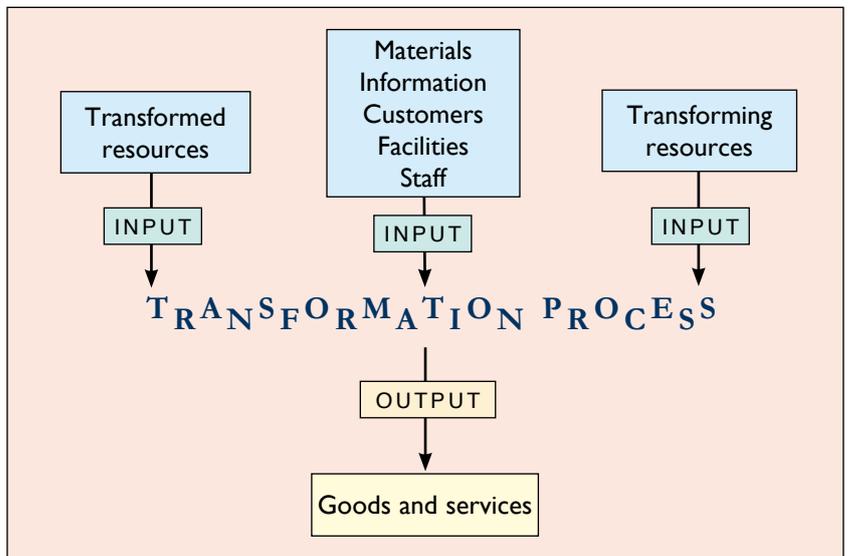


Figure 1. A general model of an operation. Adapted from Slack et al (1998).

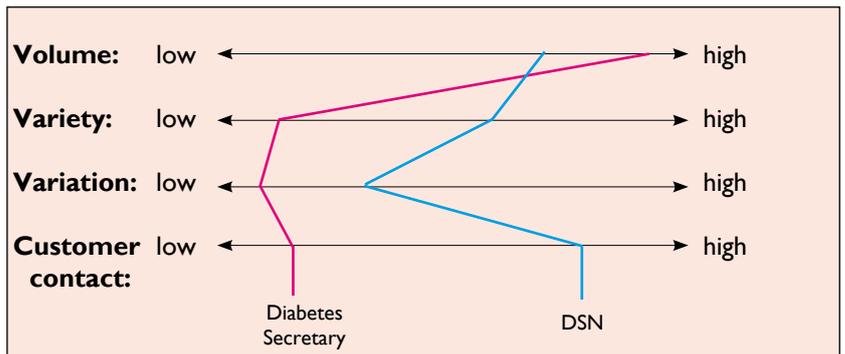


Figure 2. Operations profile of the diabetes service.

Both services involve the following transformation process. Clients visit the diabetes clinics by appointment. During the consultation (with any team member), their diabetes management is assessed, and concerns and therapy changes are identified and discussed. Information is given and strategies are determined to reduce or resolve problems. After the consultation, the client will either be reviewed again by the team, or discharged back to primary care. Whatever the outcome, clients are able to contact the department directly via a hotline. In system B, the provision of an education room has enabled the nursing team to offer education sessions to different client groups in addition to individual consultations. Lack of protected space did not permit such initiatives in system A.

A successful transformation process requires the following:

- Systems for appointments and recall to clinics
- Predetermined times for clinics

- Appropriate manpower
- Communication systems, e.g. letters to GPs or consultants after consultation
- Appropriate equipment, e.g. insulin pens, blood testing meters
- Written client information.

The process involves all team members. The duty rota reflects the variable number of clinics on different days. DSNs are also involved in phone support (manning the hotline) and ward visits.

Service is an entity that is produced on demand and cannot be stored or transported. Typical aspects of an operation providing a service and involving the 'processing' of customers are:

- Volume — quantity of customers using the service
- Variety — the range of the service
- Variation — variable demand, e.g. seasonal changes
- Customer contact.

Figure 2 shows the profile for the diabetes service. Each 'micro-operation' has a rating of low to high for the DSN and a secretary,

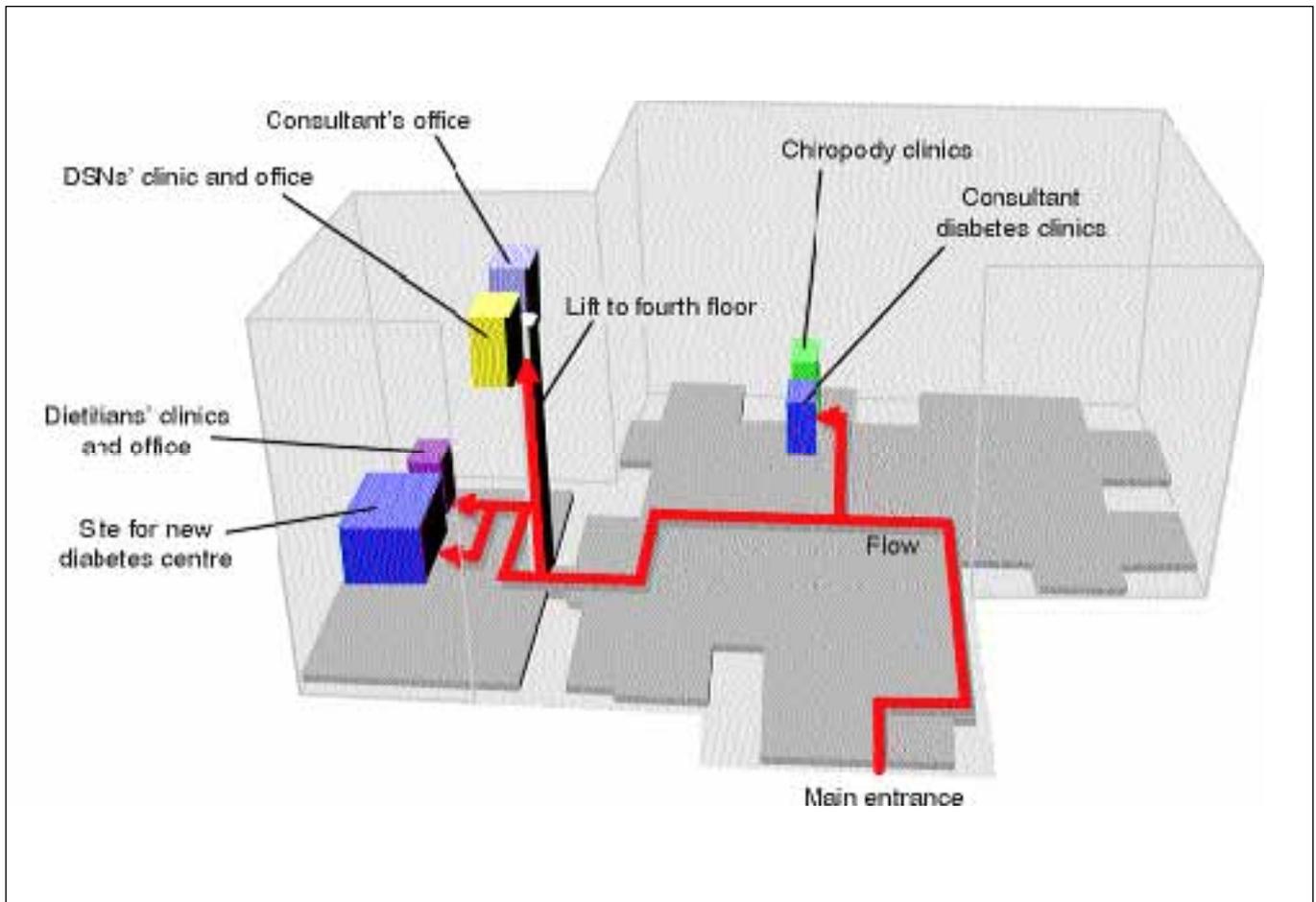


Figure 3. Plan of system A. The location of the diabetes centre (system B) is also shown.

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according to the tasks involved and skills required. For example, the DSN has high customer contact.

Location

In system A, diabetes care was provided at five different locations, on different floors, in the acute hospital (Figure 3). The facilities at the locations were as follows:

- DSNs' clinic and office
- Consultant's office
- Consultant diabetes clinics
- Chiropody clinics
- Dietitians' clinics and office.

The distances between each location could be considerable (especially for many older clients). This was more of a problem when clients went to the wrong clinic. Also, unsurprisingly, many clients got lost.

It is apparent that system A had little planning or strategy for the provision of diabetes care. The spatial dispersion prevented the team members from meeting regularly or working together as a team, with all the benefits of shared expertise that this brings (Adair, 1990).

In system B (Figure 4), all clinical areas are on the ground floor. Thus, all diabetes care, except retinal photography, can be provided in one location. This benefits

older and disabled clients. Furthermore, in comparison to system A, there is less frustration and less time wasted for both staff and clients.

In both systems, however, patients have to travel a considerable distance from the main entrance.

Layout and flow

System A

System A demonstrates a process-based layout (as would be expected in a hospital environment). Clinical locations were scattered around the hospital, and shared with other departments. They could only be used by the diabetes team at specific times, thus reducing flexibility of the service and scope for initiatives to be acted upon.

The DSN/consultant waiting area illustrates some of the disadvantages of system A. Essentially, the waiting area consisted of seats in a poorly lit, busy corridor. It was located between medical wards which were noisy and often smelly (this could be distressing for many clients). Access entailed a lot of walking from the main entrance and often, when the lift was broken, climbing stairs. In short, it was not 'client-friendly'.

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1 In a process layout, similar processes are located together, e.g. in a hospital.

2 Within a process layout there is a complexity of flow; a cell layout is an attempt to regulate this.

3 In a cell layout, all immediate resources meeting a service or product need are located together.

4 A product layout involves locating resources into a pre-arranged sequence of activities, as in a car assembly line.

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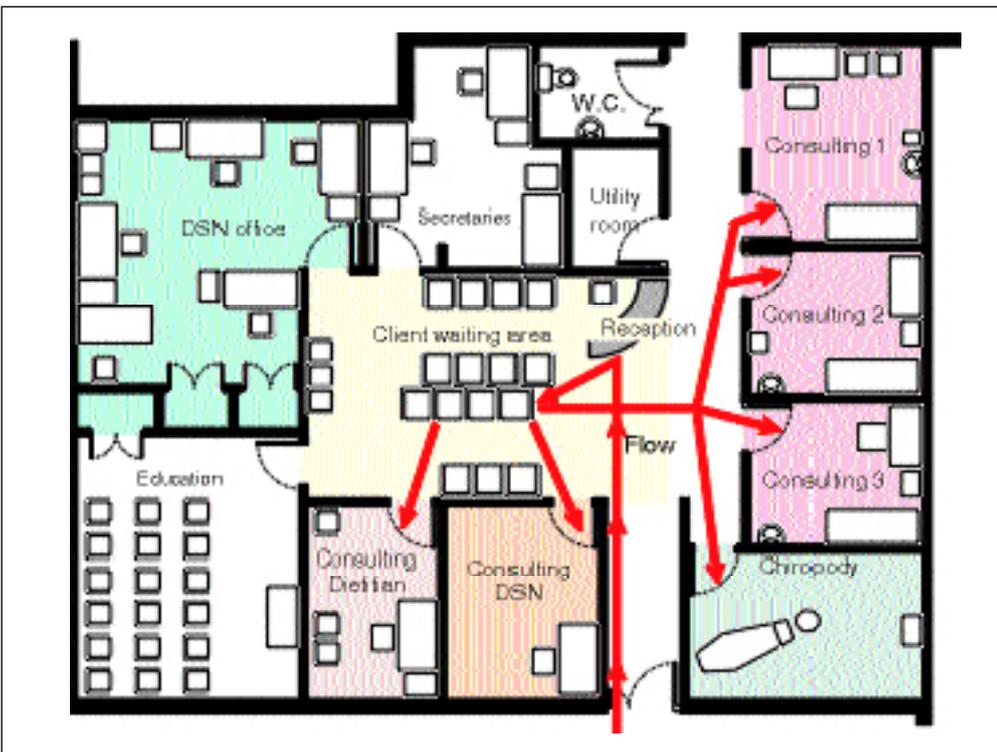


Figure 4. Plan of system B.

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System B

In system B, the process layout resembles a cell layout (more than system A). All the clinical facilities and most of the direct resources (staff, equipment, technology) are at one location. The diabetes centre can thus function as a pure cell. This provides the flexibility of the process layout of the centre, which was achieved through intuition, common sense and trial and error, with the simplicity of a product layout (Slack et al, 1998).

All clinical areas in daily use are located on the outside (in response to the general preference for natural light and a view). The waiting area is an improvement over the one in system A. The central area benefits from natural light entering through glass doors in both exits.

Figure 4 shows client flow in system B. Once inside the entrance, clients are welcomed by the receptionist, and then asked to wait until called by the relevant team member. During busy clinics, congestion sometimes occurs around the reception desk. This could have been prevented by placing the desk nearer the secretaries' and DSNs' offices. However, the existing layout has the advantage of providing an easily visible point of contact as soon as clients enter (this is a good example of the compromises that have to be made in operations planning).

All clinical rooms are clearly labelled. A main notice board indicates which team member is running each clinic. There are also information displays with literature for clients to take away. Signposting to the centre is also much clearer.

Ground floor access with wide doors and ramps offers good access to disabled clients. Compared with system A, the (new) seats are more comfortable and mobile, enabling wheelchairs to be accommodated more easily.

Overall, system B is a calm environment. It has fewer people passing through it than was the case at the clinical locations in system A. It is also a much safer place for staff and clients with clear corridors and clear fire exits.

Natural light access was the only consideration when determining the placement of clinical work areas. No planning provisions were required for

equipment placement because noise, sterility and hazardous materials were not issues.

The centre has some in-built flexibility, e.g. either consulting room 2 or 3 could be converted into a consultant's clinical room or office if a second diabetologist was appointed. There is an additional desk for a secretary in the secretaries' office.

Appearance

Appearance is very important because it contributes to the first impression. In system A, the DSN clinic room was in a poor state: it needed redecoration and was full of tatty furniture. In this setting, DSNs endeavoured to provide professional information and support. They appear to have been successful: an audit of client views on care given in terms of environment, welcome, empathy and support was overwhelmingly positive. No client mentioned the room, some commented on the proximity to the wards and the noise and busyness of the corridor, and some the poor signage. The majority appreciated the care given; this information was used in the planning of system B.

Fundraising efforts for system B yielded a budget of £50,000 for furniture, equipment and computers. Although restricted by the Trust colour scheme, all staff were involved in choosing both furniture and layout of individual work centres (carpet swatches, chair loans and desk designs became as commonplace as insulin pens). By contributing to decision making and influencing outcomes, staff members experienced a sense of ownership and could feel part of the centre development; higher job satisfaction was the outcome (Rosenfield and Wilson, 1999). Innovative equipment in the education room enabled all audio visual aids to hang on rails. Stacking chairs improved flexibility of use.

The new centre 'smells and looks great'. Clients appreciate the centre, and some of them have commented that it does not feel part of a hospital. This is regarded as a positive comment by the diabetes team!

The centre is also viewed with a sense of pride by those who helped to raise funds, who were invited to private viewings before the official opening and the Trust board itself.

PAGE POINTS

1 The process layout of system A was not client-friendly, and prevented team working because of spatial dispersion.

2 Placing of the reception desk ensures an easily visible point of contact.

3 Ownership of the project by the whole team enabled new skill development and greater satisfaction with the outcome of system B.

4 The appearance and general 'feel' of the diabetes centre create a favourable first impression.

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1 The diabetes centre provides a focus for clients who, through their fundraising, view it with a sense of pride.

2 Human resources have remained as before, yet the range and timing of education and clinics have developed.

3 System B has demonstrated how location alone has enabled team working and service improvements.

4 Diabetes team members have gained further responsibility and enhanced their skills; consequently, job satisfaction and intrinsic and extrinsic motivation have increased.

Job design

System B offers many advantages over system A. The diabetes team has protected space, and can meet and discuss issues regularly, both formally and informally. This space enables new initiatives, e.g. group sessions for insulin transfer, to be developed and implemented.

In system A, the DSN team felt that the service they provided was restricted. All DSNs have defined responsibilities such as client groups, and tasks to perform on certain days, e.g. ward liaison, phone advice, teaching of clients or health professionals. There was limited space, which did not permit changes in clinic times or addition of extra teaching sessions.

Many of the above desirable features were incorporated in system B. There are additional sessions in the education room, clinics in the afternoon as well as the morning, and regular team meetings to discuss operational and developmental issues. Staff have taken on direct responsibility for the additional projects and processes, and gained more autonomy. In this way, skills have been enhanced (Handy, 1999). The end result is higher team job satisfaction and increased intrinsic and extrinsic motivation (Rosenfield and Wilson, 1999).

Technology

In system A, there were four computers; in system B, there are 15, largely as a result of fundraising. Computers have been placed on every desk in the centre. They provide access to medical results for nursing staff, and allow activity levels to be entered onto the computer database in real-time. Staff members are encouraged to develop their computer skills. All DSNs, who previously had little contact with computers, have developed the necessary skills and are using their computers for data entry, presentations, and e-mail on a daily basis. Presentations are also run in the waiting area to inform clients on team issues, latest research, etc. This is another example of an innovation that is possible in system B but was impossible in system A.

Organisational structure

The DSN, consultant, secretaries and receptionist are all employed by the medical

directorate; this applies to systems A and B.

Although the DSN's role included management of human resources and equipment within the diabetes team, as well as involvement in strategic planning with the consultant, this was only formally acknowledged by management when system B was in place. Negotiations concerning job description and title are underway.

Diabetes team members encourage managers and Trust members to visit the centre regularly, and all diabetes-related meetings are held there. Such activities emphasise the value placed on diabetes care within the Trust. Centre members need to be proactive in influencing decision makers regarding their value to the Trust, clients and other health professionals, given that the team is relatively expensive — all DSNs are at ward sister grade or higher.

Conclusion

It can be seen that the change from system A to B has enabled both service improvements and personnel development to take place.

It underlines the importance of ownership, job enrichment and autonomy to team dynamics. To many of the team members, the centre does 'feel like home', having collectively invested so much time and effort into it.

Human resources, except for the appointment of a receptionist in system B have stayed the same. In system B, however, a far greater range of education and clinic times are available.

System B emphasises location and ability to work as a team, along with a relaxed and comfortable environment in which to work and be seen.

With its cell layout, the diabetes centre is virtually self-sufficient. Staff members will continue to innovate, develop, and enjoy their input to diabetes care. The result will be an ever-improving service for clients. ■

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