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Implementing Operations Strategy through Lean Processes within Health Care - the example of NHS in the UK

Structured Abstract:

Purpose

This paper is part of a process of ongoing longitudinal cases studies that investigate how Operations Strategy and Lean concepts can be applied within a Healthcare organisation and the degree to which both Lean and Operations Strategy are understood by senior-level NHS personnel. Further interviews and data analysis will examine actual performance of Lean capabilities within the NHS.

Design/methodology/approach

For this explanatory multiple-case study project we collected Data through semi-structured interviews with executives in the NHS to understand how operations strategies are developed in the NHS and implemented in NHS hospitals. The Unit of Analysis is the hospital. Multiple (22) interviews took place over 12 months with senior-level personnel responsible for implementing change via Operations Strategy goals, and incorporating Lean initiatives. In addition, to triangulate data, we examined healthcare reports and strategy policy documents from each case hospital. This forms stage 1 of a longitudinal study which will examine the actual performance of Lean within the NHS hospitals across a range of operations parameters and explore links between such capabilities and the role and importance of operations strategy in more detail.

Findings

Our Findings lead to the conclusion that operations strategies were not fully developed within the hospitals. In addition, our ongoing data capture shows that 'Best practice' was not being disseminated across the NHS, for either patient experience or organisational effectiveness and the role of operations strategy was not fully clear other than as a rather vague 'umbrella' term. Despite Lean's attraction for Healthcare at a micro level, significant operational and cultural hurdles must be overcome for the full strategic benefits of Lean to be realised. A much more holistic approach in providing a full service for the whole of the patient journey is needed.

Research limitations/implications (if applicable)

Our sample provides an initial snapshot. A larger number of hospitals and/or further longitudinal research will be needed to deepen understanding of embedding strategic change to improve overall performance.

Practical implications (if applicable)

Tackling cultural performance and operational issues at a macro level could help Healthcare providers reconcile the perceived conflicting goals of improving patient care (i.e. service delivery) whilst simultaneously reducing costs. The role of explicit operations strategies could be pivotal in designing and implementing such change.

Originality/value

This research builds on and extends the work of Toussaint and Berry (2013), Seddon and O'Donovan (2010) and Carlborg and Kowalkowski (2013). We highlight how some of the

apparent contradictions in the requirements of the various stakeholders create operational and strategic tensions. We highlight the multifaceted nature of design and delivery of a multi-touchpoint service within the complexity of a large healthcare provider.

Keywords: Service operations, Healthcare, Lean, Public services, Performance, Strategic capability

Article Classification: Research Paper

Implementing Operations Strategy through Lean Processes within Health Care - the example of NHS in the UK

INTRODUCTION

Healthcare is perhaps the most personal and important service people experience, yet is not a service that people necessarily seek (Berry and Bendapudi 2007). Although the focus tends towards the technical aspect of service provision, ‘patient experience’ transcends a purely medical and organisational perspective (Makarem and Al-Amin 2014). Providing healthcare services in an environment where patients are increasingly experience-aware and ever-tighter financial constraints prevail, presents challenges both for service design and performance in operations management (Zomerdijk and Voss 2010, Dey *et al.* 2013, Tax *et al.* 2013). This highlights the important role of operations strategy because it becomes the means by which a range of operations management initiatives can be defined and implemented within organisations (Hill and Hill 2011), including healthcare providers.

‘Lean’ is one of these operations management initiatives that has received significant attention from both practitioners and scholars within service environments (Panchak 2003, de Souza 2009, Mazzocato *et al.* 2010, Burgess and Radnor 2012, Vegting *et al.* 2012, Toussaint and Berry 2013, Bhat and Jnanesh 2014). The application of Lean processes is alluring for healthcare managers globally because of the promise of combining cost reductions with outstanding standards of health service to patients. Lean is widespread as a label for interventions in the UK National Health Service (NHS) although the interpretation of Lean is varied and its implementation remains a challenge (de Souza 2009, Papadopoulos *et al.* 2011).

Many hospitals have embarked upon ‘Lean projects’ to improve performance, and, similarly to Papadopoulos (*ibid*), researchers have noted varied success levels and identify that this

might be due to the focus on the “tools of Lean”, rather than the application of the holistic philosophy of Lean (Burgess 2012, Matthias and Buckle 2016).

This case study research explores the degree to which senior-level personnel within the NHS understand and practice two key aspects of Operations Management:

- a) Operations Strategy and its application within the NHS
- b) Lean and the range of operations performance criteria applied in Healthcare.

These two areas were chosen because they are linked operationally: the term “operations strategy” is used as an umbrella term to deal with long-term change projects within the NHS; additionally, embracing Lean practices has been seen as a key driver for change within the NHS¹. This triggered the desire to explore how senior-level NHS staff understood these two terms and how they were implemented. This paper follows on from extensive primary research with senior NHS managers, and builds upon other published outputs in IJOPM regarding Lean and service provision (Moyano-Fuentes and Sacristán-Díaz 2012, Malmbrandt and Åhlström 2013, Bamford *et al.* 2015, Samuel *et al.* 2015, Waring and Alexander 2015).

It comes at a time when there is extensive and heated debate within the British Parliament concerning the future of the NHS – specifically its cost and service quality performance.

(see for example: the following web references:

<http://www.parliament.uk/business/news/2015/july/lords-debates-nhs/> and
<http://www.parliament.uk/business/news/2016/january/lords-nhs-debate/> and
<http://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news-parliament-2015/sustainability-performance-hospital-trusts-report-published-15-16/>
Accessed 20 April 2016).

¹ <http://www.england.nhs.uk/wp-content/uploads/2013/12/5yr-strat-plann-guid-wa.pdf>,
http://www.institute.nhs.uk/quality_and_value/productivity_series/productive_ward.html
<http://www.quest.nhs.uk/> (Accessed 9th February 2015)

This paper examines some of the key issues facing the NHS with its attempted adoption of operations strategy and improvement practices as it simultaneously grapples with two key strategic objectives: i) improving service delivery and customer satisfaction, and ii) reducing costs. The paper then develops aspects of the process and content of operations strategy in engendering a performance culture, also necessary when implementing Lean processes for sustainable results.

In an attempt to provide transparency and accountability for its funding, and improve efficiency, the UK government has introduced successive policies, shown in Table 1.

Table 1: Key NHS Initiatives

| Initiative | Year | Purpose |
|--|--------|--|
| “Working for Patients” | (1989) | First attempt to standardise clinical audit as part of professional healthcare |
| “Principles for Best Practice in Clinical Audit” | (2002) | To improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change |
| The Darzi Report | (2008) | Ambitious visions for the future of health and healthcare to enable the local NHS to achieve improved health and high quality care for all. |
| Health and Social Care Act | (2012) | Puts clinicians at the centre of commissioning, frees up providers to innovate, empowers patients and gives a new focus to public health. Sets up a new NHS commissioning board called NHS England to oversee the NHS from the DoH |
| The Nicholson Challenge | (2010) | Introduced the QIPP (Quality Improvement Productivity and Prevention) challenge to the NHS to improve quality whilst making efficiency savings. Sir David Nicholson (leader of the National Health Service in England, 2006-2012) set the challenge of saving £15-20 billion through efficiency savings from 2011 to 2014. The challenge was to make these savings through better ways of working, whilst keeping quality as its organising principle. |
| The Francis Report | (2013) | Makes 290 recommendations, including: openness, transparency and candour throughout the healthcare system (including a statutory duty of candour), fundamental standards for healthcare providers, improved support for compassionate caring and committed care, and stronger healthcare leadership. |
| Berwick Report | (2013) | Berwick review into patient safety - Recommendations to improve patient safety in the NHS in England |

| Initiative | Year | Purpose |
|--------------|--------|--|
| Keogh Report | (2015) | <p>This is a set of guidance documents entitled ‘Transforming Urgent and Emergency Care Services in England’. These include :</p> <ul style="list-style-type: none"> • The local health economy finance template • Improving referral pathways between urgent and emergency care services in England • The clinical models for ambulance services |

The Francis and Berwick reports’ recommendations, focusing on patient safety and quality of care, could be interpreted as a consequence of the years of emphasis on cost reduction and efficiency increases, whilst the Keogh report once again prioritises throughput and process. It is not surprising, therefore, that the UK NHS has been intermittently attracted to a range of managerial and business initiatives, most notably the promises of Lean with its associated reduction of waste in all forms, including financial overspending, and its emphasis on quality processes.

The paper is arranged as follows. The Introduction has provided some background and context regarding the nature of the NHS and the unique demands that it faces. The literature review explores operations strategy, service operations, and Lean in Services. This is followed by an explanation of the research approach adopted, after which the findings are presented. A discussion section and a set of conclusions and suggestions for future research complete the paper.

LITERATURE REVIEW

Operations Strategy

The NHS use of the term ‘operations strategy’ has been noted above. However, adoption of this term within the NHS might not necessarily mean that its potential is fully understood; or that it resonates either with what other organisations have adopted or with what the literature has to say about the possible contribution that operations strategy can provide for

organisations in both manufacturing and services environments. The term, operations strategy, developed from the term, 'manufacturing strategy' and was established as a core topic in Operations Management by major contributions from US academics, led by Skinner (1969, 1974), along with Hayes and Wheelwright (1984). This was developed in the UK by academics such as Hill (1985), Voss (1996) and Brown (1996). Over time the term has been adopted to reflect the increasingly service-dominant nature of most economies, shifting focus from manufacture of goods to the provision of services (Voss *et al.* 2008, Spring and Araujo 2009).

The purpose of an operations strategy is to provide the broader conceptualisation of 'value' and service delivery, create organisational knowledge and enable planning to reconcile market requirements and resources (Slack 2015). Previously, Brown *et al.* (2013) had also suggested that operations strategy is:

- Concerned with meeting existing market needs and exploiting opportunities for potential market segments
- About making the best use of resources, and leveraging these resources either alone or with partners
- The responsibility of senior-level managers within the firm - while recognising the importance of a range of stakeholders in the process, be they internal or external
- About devising and implementing processes that will enable the enterprise to compete and, ideally, to create competitive advantage
- Concerned with developing capabilities within the firm's Operations that are superior to other competitors and which other competitors either cannot copy or will find extremely difficult to copy

All but the last point has direct relevance for the NHS, which needs to make best possible use of public resources to deliver a public service. Further insights into the importance of operations strategy are provided by offering an indicative list of the type of areas that the operations strategy can contain, of which a number, if not all, are pertinent to today's healthcare environment (Brown *et al.* 2013):

- Management of value
- Sustainability
- Ethical Issues
- Capacity management
- Location decisions - the range and locations of facilities
- Process management
- Managing technology
- Formation of strategic buyer-supplier relationships as part of the organisation's 'extended enterprise'
- Innovation - new product or service introduction
- Human resources management

Healthcare, as already noted (Berry and Bendapudi 2007, Makarem and Al-Amin 2014) is a service experience for all patients. Despite its relevance to healthcare operations, there is little research on Operations Strategy in healthcare (Rifai and Pecenka 1990, Butler *et al.* 1996, Li *et al.* 2002, Silvestro and Silvestro 2003). This research seeks to address that by first interviewing senior personnel and gauging their understanding of the role of Operations Strategy and Lean in implementing change within the NHS. Also, as noted earlier, this forms part of longitudinal research, the second part of which will deal with actual performance in Lean and examine the links between such performance and Operations Strategy and Lean planning.

As Singh *et al.* (2015) have noted there are two dominant but, possibly contradictory, views on how organisations can develop and utilise their operations capabilities. The 'trade-off' model (Skinner 1969, Hayes and Wheelwright 1984) views operations capabilities being aligned with the mission and mainstream strategy of the organisation. It then posits that organisations need to prioritise around a few, key capabilities at a time and not seek to be 'all things to all customers.' However, practices such as mass customisation and agility, which emerged in response to increasing, and changing, customer needs – coupled with intense competition in many markets - have brought this approach into question.

Consequently, the second approach, based upon ‘cumulative capabilities’, emerged and gained in popularity. This approach suggests that a range of operations capabilities should be developed and protected simultaneously (Ferdows and De Meyer 1990). What becomes clear for either approach is that accruing, developing and protecting a range of operations capabilities in services, including healthcare, will not ‘just happen’ (Brown *et al.* 2013). Instead, an operations strategy needs to exist to enable such capabilities to develop over time (Brown 1996, 2000).

Operations strategy is not just about what it contains but is also concerned about the process of its development and implementation. Thus, for example, operations strategy can be viewed as central to the *implementation* of an already devised business strategy. In this approach, operations’ role is important in providing ‘strategic fit’ in focusing efforts and resources so that operations strategy is consistent with, and helps to support, the already devised wider strategy from above (Hayes and Wheelwright 1984, Miller and Roth 1994). Conversely, operations strategy can be used in a more proactive approach. Here, operational capabilities would be viewed as part of the core capabilities/competencies of an organisation (Hamel and Prahalad 1994). Operations’ contribution would thus be central to the *planning* stages of business strategy and not restricted to the implementation of an already devised strategy. This approach equates with stage four of Hayes and Wheelwright's (1984) model, whereby operations’ role is central in *creating* strategies to gain competitive advantage.

Various models of the process of formulating operations strategy - who is involved, and at what stages – have been devised by scholars such as the Hill template (1985) and Brown *et al.*’s strategic resonance model (2013). However, there can be little doubt that, historically at least, the process within the NHS has been top-down. This places emphasis upon senior-level managers’ ability to understand the content and scope of operations strategy –

specifically, in this research, when linked to Lean initiatives. Such understanding of operations strategy by senior-level staff, including CEOs, has been questioned consistently (Skinner 1969, Hill 1985, Brown 1996, Pisano and Shih 2009). It was this understanding of the linkages between operations strategies and Lean that was examined in our primary research.

The Emergence of Lean

The term Lean was coined by Krafcik (1988) when analysing the Toyota Production System (TPS). It encourages the full development and integration of technology, policies and human resources with minimum amounts of waste in all forms. It was brought to widespread attention by Womack *et al.* (1991) in their book, *The Machine That Changed the World*. The authors' claims were both bold and clear:

"...the adoption of Lean production, as it inevitably spreads beyond the auto industry, will change everything in almost every industry - choices for consumers, the nature of work, the fortune of companies, and, ultimately, the fate of nations" (Womack ibid:p12)

As the application of Lean expanded into other sectors, Lean production evolved into the concept of *Lean Thinking*, as Womack and Jones (2003) described. The over-riding ethos in Lean Thinking remained focused on the elimination of non-value-adding activity (labelled 'waste'), leading to optimum flow of materials and information throughout the value chain, increased customer service and higher quality.

Much of the above is familiar to those concerned with service delivery, be it quality or recovery (Bamford and Griffin 2008, Patricio *et al.* 2008, Smith *et al.* 2010, Malmbrandt and Åhlström 2013). It is important to note that there was no mention of reduction in costs in *The Machine That Changed the World*, nor in their subsequent books, which moved the focus from manufacturing to service (Womack and Jones 2003, 2005). Rather, the

implication was that by improving a range of capabilities related to Lean, including layout, quality, inventory management, space reduction and process design, the changed practices that are the outcome of Lean implementation would then lead to subsequent financial improvements. This echoes the thinking outlined by Ferdows and De Meyer (1990) in their theory of Operations Strategy development presented as the Sandcone Model. They outline a specific sequence which helps organisations achieve substance and not just form in performance improvement, highlighting simultaneous capability development and protection. Firstly quality, followed by dependability and speed. All three are objectives fundamental to continuous improvement and the philosophy of Lean. Cost improvements become an inevitable consequence of resources and management efforts invested in improvement.

However, even from the outset, there have been criticisms of Lean to counteract the enthusiasm. One of the main areas of concern is of direct relevance for this research – the gap between operations strategy and Lean. For example, Brown (1996) noted, even within manufacturing environments, weaknesses existed, including:

1. The explicit role of the manufacturing function is, largely, ignored in terms of its contribution (at any stage) to corporate planning in Lean.
2. Womack *et al.* (1991) honed in on the *operational* specifics without addressing the link between operational performance and manufacturing involvement at senior levels within the firm.

It is unsurprising therefore that the success of transfer of Lean principles to Service environments, including Healthcare, is still debated and that a broader approach, as used in Operations Strategy, is advocated (Mazzocato *et al.* 2010, Burgess and Radnor 2012, Sloan *et al.* 2014).

Lean in Services

Lean processes have been adopted with some success within a range of back-office environments, including government departments and libraries (Beuster 2011, Kleback 2012, Wallace 2012). However, problems with adopting Lean in services have been well-documented. For instance, Seddon and O'Donovan (2010) posed doubts about Lean's ability to deal with variety within services. They discuss how standardisation within service organisations must be modified to deal with variety and how this can only be achieved by understanding the value demands from the customer's perspective. Their focus on Her Majesty's Revenue & Customs (HMRC) indicated that standardisation of taxation services caused failure demand. Carter *et al.* (2011) investigated the impact of Lean on labour processes in HMRC. They argue that Lean has a detrimental effect on employees, their working lives, and the service that is provided to the public. They conclude that the consequences of Lean on public sector work are highly problematic.

Using case studies of large UK Government departments, Radnor and Johnston (2012) concluded that although some public service organisations recognise that Lean can improve their *internal processes*, they have not linked this to value or customer service. These are the same issues around Lean that concerned Brown (1996), listed earlier, regarding the adoption of Lean within manufacturing: namely, the absence of a strategic perspective.

Thus, the 'success' of Lean practices within services generally and public services more specifically is, at best, mixed.

Lean in Healthcare

The adoption of Lean within Healthcare has created interest in both trade and academic journals since it seemingly offers a response to the simultaneous pressures to improve

quality and lower costs (Grabau and Swartz 2012, Robinson *et al.* 2012, Vegting *et al.* 2012). Toussaint and Berry (2013) present a strong case for the adoption of Lean, and there are examples of Lean being applied successfully to Healthcare services in a number of countries.

In Hong Kong, Chan (2012) examined how applying Lean improved the patient pre-consultation time in outpatient services and found that Lean worked well if used by a multidisciplinary health team. Results led to reduced congestion in the patient waiting area, improved patient flow, reduction in patient complaints, reduced staff workloads and improved internal air quality. In their research, Bhat and Jnanesh (2014) showed how Lean Six Sigma methodology had been applied to reduce the cycle time of out-patient department service in a rural Indian hospital from 4.27 minutes to 1.5 minutes. They also noted a 97% reduction in average waiting time in the system and 91% decrease in queue length.

LaGanga's (2011) research in outpatient service operations in the USA showed how a Lean process improvement project conducted to increase new patients admissions capacity increased throughput by 27% and reduced the no-show rate by 12%. Murphree *et al.* (2011) also noted that a range of benefits are possible to a variety of stakeholders when Lean is implemented as a continuous process, similar to the notion of continuous improvement, rather than as a series of mini-projects.

Within NHS Hospitals most change initiatives tend to follow the path of incremental, rather than breakthrough, change and improvement (Ritchie 2002, Umble and Umble 2006). This is partly due to the sheer size of the organisation; but also due to cultural constraints, since change in the NHS is framed by an increasingly prescriptive and centrally-driven set of performance measures (Currie and Suhomlinova 2006). It is also partly due to professional and policy constraints, arising from a mosaic of professions, large-scale structural change

and the presence of central targets (Currie and Lockett 2011). Consequently, given findings such as those presented by Murphree *et al.* (2011) and Hagan (2011), it would appear that the adoption of Lean thinking and practice would be an ideal approach to engender the kind of change that policy-makers seem to want. However, Burgess (2012) and Matthias and Buckle (2016) note a continuation of piecemeal Lean implementation, where the tools and techniques of Lean are used only for discrete, targeted areas of improvement across the NHS.

This review of literature on implementing operations strategy and Lean in service industries and healthcare in particular raised a number of questions:

1. Is there a structured, planned approach to service or operational delivery?
2. Where and how does behavioural and performance improvement feature as part of operations strategy planning?
3. Who is responsible for operationalising and achieving policy and performance objectives within hospitals?
4. Are the specifics of Lean criteria set in place within the NHS and, if so, are they well known and understood at all levels?

These issues became the basis upon which the primary research was conducted.

METHODOLOGY

The purpose of this research was to explore the degree to which senior-level NHS personnel understand and practice Operations Strategy and Lean, two key aspects of Operations Management. The objective was to track the cascade of strategy development and implementation, and the role of Lean within that, from NHS England, through the clinical commissioning groups (CCGs) to hospitals. The case study approach was adopted, to provide an explanation and practical insight regarding the two concepts and any relationship between them. Centring on context understanding the construct of a process, having an explanatory component and where most of the evidence comes from interviews, it is the

most appropriate methodology, following the Renaissance tradition of scientific enquiry (Barratt *et al.* 2011, Ketokivi and Choi 2014).

Data Collection

To enable a full grasp of the processes and people involved, a two-stage approach was adopted. The first stage was to understand how corporate-level strategy was established. The second stage was to understand how strategy was operationalised, and to establish and compare the processes used. Myers (2013) determines one well-researched and presented case is enough. Eisenhardt (2002) suggests 4-10 cases capture real-world complexity whilst avoiding cognitive overload for analysis. Six hospitals were used as case studies. This guards against bias, provides robustness, reliability and triangulation (Barratt *et al.* 2011).

NHS England and a local CCG were approached for the corporate process.

Hospitals were contacted, based on size and proximity to the primary researcher, from a list: <http://www.nhs.uk/servicedirectorios/pages/acutetrustlisting.aspx> (accessed 5th January 2015). All hospitals were urban, northern and teaching, ranging in size from 4,000 to 15,000 staff, representing in total 58,000 NHS staff.

Data Collection

A semi-structured interview protocol was developed (Appendix A) comprising a set of questions asking how corporate and operations strategy is developed, implemented and monitored, and how and why Lean featured.

Participants were sought purposively – they had to be involved in developing and disseminating strategy and responsible for overall outcomes. A Director and a senior researcher provided the NHS England process. During these interviews it emerged that the

CCGs (Clinical Commissioning Groups) role is commercial and contractual, not operational and therefore CCGs appeared unsuitable contributors. The local CCG confirmed this.

Participants in the six case hospitals are shown in Table 2.

Table 2: Interviewee Profile

| Hospital | Interviewee Role | Years in post |
|----------|--------------------------------------|---------------|
| 1 | CEO | 2 |
| 2 | Director of Planning | 3.5 |
| 3 | COO | 0.5 |
| 4 | Director of Strategy and Development | 5 |
| 5 | Director of Pharmacy | 19 |
| 6 | COO | 5 |

All interviews were face-to-face, in the participants' offices, or by telephone. In total, 22 interview sessions took place. The first 6 were the main fact-finding interviews and took up to 1.25 hours. Subsequent interviews were follow-up, to confirm and clarify previously-captured information. They were recorded and transcribed immediately afterwards.

Written and electronic strategy documentation from each hospital was also gathered.

Data Analysis

The data analysis process is shown in Table 3. Similar to Corley and Gioia (2004), Gioia *et al.* (2013) and Ketokivi and Choi (2014), it dissects the data into comparable and analysable information.

Table 3: Data Analysis Process

| Category | Source |
|----------------------------|--|
| Primary Resource Package | NHS England Interview |
| Secondary Resource Package | Case interviews (hospitals) |
| Primary Analysis (by case) | Process outline Descriptive narrative Analysis of strategy documentation |
| Second stage analysis | Cross-case analysis |
| Third stage analysis | Unifying and differentiating features |
| Fourth stage analysis | Insights and proposition development |

The analysis approach, applying cognitive reasoning, was abductive interpretative (Mantere and Ketokivi 2013). The process and timeline of strategy development was noted by case. The documentary evidence was compared against the empirical findings and any alternate interpretations were noted.

The cross-case analysis (Table 4) looked for differences to the corporate process, seeking to identify specific case idiosyncrasies and/or variations.

Table 4: Cross-Case Analysis Grid

| | NHS England | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 |
|-------------|-------------|--------|--------|--------|--------|--------|--------|
| NHS England | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Case 1 | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Case 2 | | | | ✓ | ✓ | ✓ | ✓ |
| Case 3 | | | | | ✓ | ✓ | ✓ |
| Case 4 | | | | | | ✓ | ✓ |
| Case 5 | | | | | | | ✓ |
| Case 6 | | | | | | | |

In total, 15 cross-case analyses were carried out, and each case was analysed against NHS England, giving a further 6 individual analyses.

FINDINGS

The findings are presented in line with the questionnaire structure.

Strategy Development

*“The development and creation of the strategy tends to be a positive process. It is the enacting of the strategy and the political cycle which removes the positivity”
(NHS England Executive 1)*

He explained that the Government and NHS England develop and create the NHS strategy collaboratively, setting out high-level national expectations. The objective is the NHS

mission - “high quality care for all” - as advocated in the Darzi Report (DoH 2008), and the requirement for a more productive NHS, to reconcile the funding:service requirement shortfall, as advocated by Sir David Nicholson (2010).

There are two drivers: Politics and Health (clinical and epidemiological), with a disconnection between the two. Politics is a critical feature, yet:

“...politicians have attempted to distance themselves from direct control of the NHS, leaving themselves with an inability to influence sufficiently” (ibid)

Strategic direction is formally developed July-December each year by NHS England (which commissions primary care), the CCGs (who commission all other care) and local authorities (who commission social care) to plan services over a 5-year horizon. In December, with the consent of the Secretary of State, the guidance is released to the Areas:

“It sets out the overall strategic direction, including immediate priorities. The Area Teams are tasked with translating that into specifics for their local area. The conclusion of that process should be a transparent 5-year vision backed up by a 3-year operational plan.” (NHS England Executive 1)

The CCG role is to control and to try to influence the flow of patients to hospitals.

Potentially, if hospitals attract more patients they get more money. However:

“The total money is fixed, so if every hospital in the country wanted to cover their increased costs by income generation (growth) they would all fail, making it a zero-sum game.” (NHS England Executive 1)

The outcome is a set of contracts with different providers so that at the annual review there is a checkpoint, and an annual 4% cost cutting/efficiency improvement challenge. The money flows because:

“Commissioners determine what services and what price” (NHS England Executive 2)

Everything hinges on financially driven criteria, which shapes the “operations strategy” response. The hospital participants broadly concurred with the process outlined by NHS

England. There were some differences and contextual nuances. For instance, Executive 4 stated that there is less direct policy now than in the first decades of the NHS. He believed the DoH set a broad approach and local health economies are tasked with implementing towards that direction. Executive 2 opined that hospital strategy has a different set of drivers from a CCG. Executive 6, however, stated that *“it’s a whole system approach”* because the NHS sets the scene, the ambition and the direction, including funding and efficiency savings and *“sets out at a high level the national expectations”*.

There was alignment amongst all participants that strategies become operationalised by the broad national ‘direction of travel’ being contextualised at the local Area level. The key content areas come from the national expectations as stated in policy documents and then outlined annually in the planning guidelines issued each December. In this respect, strategy is mandated. However, the detail is developed by each hospital, combining national targets and requirements with Commissioner influence around what they want to buy and local demographics. The nature of the patients coming into hospitals impacts capacity, funding, workforce and cost improvement targets.

Operations Strategy Development

“Hospitals’ first responsibility is to make sure that services can be delivered to standard, reliably, 24/7. However, underlying this are political, public demand, productivity, performance and organisational ambition considerations.” (Executive 4)

All hospitals agreed that ultimately the CEO owns the strategy and it is operationalised by engaging with front-line staff so that the context for strategy can be set by the organisation. Strategy development was the combined effort of clinical directorates aggregated into an overall strategy. All described the broad themes which were their key developmental categories and around which financial and operational plans were built. Executive 5 emphasised the inclusive nature of strategy development:

“...it includes workforce implications, estates, finance, service developments, and kind of service improvement, cost improvements and efficiencies. It has full engagement across the board”

The process is structured. Year one is robust and provides a routemap detailing sequenced actions for each identified key theme. Subsequent years are sequenced with less detail and subject to change based on progress and the outcomes required when the annual planning cycle is refreshed. The responsibility for implementation lies with the operational management of the organisation. Broadly, all hospitals populated the detailed action, engaged with clinical staff and created the individual clinical business strategy, whose components are activity, financial plan and a scoping vision for each service through the triumvirate of Clinical Directors, General Managers and Nurse Directors for each directorate/service unit.

“The pressure to deliver ‘more for less’ drives the improvement programmes often developed based on specific feedback that ‘something is not working optimally’ or cannot meet targets if it continues to work in the same way. ” (Executive 1)

This possibly accounts for the attraction of Lean to be adopted tactically and operationally for specific tasks that people are being asked to do. For example, treating patients within 4 hours in Accident and Emergency (A&E), termed emergency room (ER) outside the UK, requires constant and consistent management of the flow of patients through a hospital, for which Lean provides helpful tools.

Strategy Implementation and Lean Practices

All hospitals reported that teams are held accountable for outcomes through a series of monthly meetings to monitor performance against the plan. Operational realities of delivery mean focus inevitably moves amongst the key objectives.

*“Overall, we are looking for a steady hand on the tiller against all the objectives”
(Executive 3)*

All interviewees also discussed how services have changed, citing a range of examples such as drug regimens, dispensing, surgery involving overnight stays becoming day-case and then outpatients care . Such clinical pathway changes alter the fabric of provision, but not the process. They are integral to the overall direction outlined by NHS England, such as the move towards greater service provision outside hospitals. Executive 5 observed process improvements are a fundamental part of operationalising strategy:

“We don’t use badges, but we do have very clear efficiency programmes, that you could call Lean, that reduce waste and give more throughput”.

Executive 6 provided headline results of three process change projects successfully completed which respectively resulted in patient flow time halving, surgical day-care capacity increasing by 35% and medical day-care capacity increasing by 32%.

Only NHS England Executive 2 offered a detailed account of how Lean became embedded in NHS thinking. He referred to the planning document “*Everyone Counts*”² and what have become known as the six characteristics. These characteristics include using technology to improve quality and reduce cost. They set out the need to intensify service re-design in order to leverage existing capability without cutting quality. Characteristic 5 makes Lean a fundamental component of delivering the requisite operational improvement in the NHS. Agencies such as NHS IQ introduced Lean thinking to help NHS providers achieve this goal³. Some hospitals approached the productivity and quality challenge using Lean with more vigour than others. They formed the QUEST network⁴, which now has 16 Trusts as members. Hospital 2 is the only QUEST member in this project.

² <http://www.england.nhs.uk/wp-content/uploads/2013/12/5yr-strat-plann-guid-wa.pdf> (Accessed 9th February 2015)

³ http://www.institute.nhs.uk/quality_and_value/productivity_series/productive_ward.html (Accessed 9th February 2015)

⁴ <http://www.quest.nhs.uk/> (Accessed 9th February 2015)

Executive 4 posited that Lean is a catch-all for a variety of improvement methodologies which consider:

“...how can we do what we’re doing in a different, more productive way, provides a better patient experience and improves patient outcomes so that we can ultimately do more with the NHS resource available to us?”

He went on to suggest that Lean is ‘just common sense’ because “it forces you through a strictly-defined process to get the most out of what you do”. For the past two years his Trust has had a Transformation Team. The remit is to develop and embed the continuous improvement ethos and deliver on driving the change process through to the end-point. Hospitals 3 and 5 similarly reported having Service Improvement Teams.

Performance reporting takes place upwards and downwards, as well as inwards and outwards, because: *“we are a data-driven sector, monitored and regulated from every perspective”* (Executive 5).

Monthly performance meetings identify key issues, support and any further actions required to rectify drift from the plan. Less tangible, softer targets such as stakeholder management and relationship development become part of a rounded end-of-year performance review for a division/directorate. The process of ‘Refreshing’ is linked back to the strategic plan and to the staff appraisal process and risk register. All staff having an appraisal have objectives linked back to the annual plan and by implication, therefore, back to the strategy.

DISCUSSION

This multiple case-study research project set out to understand the degree to which NHS Hospital executives understand and practice Operations Strategy and Lean as part of a range of operations criteria that could be applied in Healthcare. The findings demonstrate that both are practised. Operations strategy appears to be understood and applied with some rigour and a high level of process conformance. Lean is also practised, but differently.

Table 5 indicates similarities and differences, summarised from the Findings. A discussion on how these contrast with the literature cited earlier follows.

Table 5: Hospital Participants – Homogeneity and Variance in Implementing Operations Strategy and Lean Processes

| Hospital | Strategy Development | Strategy Implementation | Lean Practices |
|----------|---|--|--|
| 1 | Strategy is effectively mandated. The CCGs drive the strategy because they take the overall guidelines and convert them into contracts, which ultimately determines what services and what price | What can be done is worked out, based on the CCG contracts and ensuring national (and own) KPIs are met, especially those around clinical effectiveness and patient experience | Zero-based planning for every initiative. Lean is used tactically to help execute the strategy. |
| 2 | Nationally the strategic drivers are standards and quality and provider organisations have to align the themes, funding and national directives | Arguably it is a series of 5 one-year plans with less detail the further ahead it goes. The core components are the clinical business strategy, the financial plan and a scoping vision for each service | QUEST member. Lean is used tactically to help execute the strategy. |
| 3 | The key drivers are the deliverables which key government commitments require for the NHS and key constitution targets. These have to be combined with local stakeholder demands, including staff | Each executive Director across the Trust has objectives against their name for an overview of them and the real implementation is in each clinical service unit. | Lean implemented in Pharmacy. Use of Lean methods encouraged in improvement plans. Service Improvement Team drives continuous improvement. |

| Hospital | Strategy Development | Strategy Implementation | Lean Practices |
|----------|--|---|---|
| 4 | The CCGs, through the commissioning process, incentivise, penalise, and encourage providers to deliver those national targets. | Each individual business unit has a business plan designed to meet the high level organisational objectives and professional practice issues which come from the DoH and NHS England by a different route, and this is then further translated and sub-divided into team action plans | Lean implemented in Pharmacy. Lean thinking is embedded in the way people work. Uses Lean to publish and publicise process and managerial changes. Has a Transformation Team to develop and embed continuous improvement. |
| 5 | A whole system approach – national and local, immediate and the 7-year forward view – sets the ambition and the direction. | It starts at the top, devolves to the clinical directorates and then aggregates back up. | Lean is not used per se. Service Improvement Team drives continuous improvement as part of delivering performance change. |
| 6 | Requirement to deliver all the mandatory standards in line with the NHS constitution and all the regulatory requirements. | Strategy is implemented through a series of annual plans, which evolve year on year and is sense-checked against the strategy overall as that too evolves | Lean projects are used tactically to improve performance. |

Table 5 shows how, to a large extent, operations' role is purely reactive to the already set out high-level national expectations as devised by the collaboration between the Government and NHS England. This conforms to the Hayes and Wheelwright (1984) concept of *internally neutral* contribution to the organisation which ensures operations personnel will not disrupt the over-riding intention of the organisation. However, the detail of strategy development as outlined by each hospital indicates participant homogeneity and a high degree of operations being *internally supportive*, which is grasping overall strategic goals and supporting them by developing a credible operations strategy.

When compared against the Brown *et al.* (2013) criteria, there is evidence that hospitals do practice operations strategy well, up to a point. The disconnection between the political,

clinical and management demands, where politicians are driven by the political cycle, clinicians by their professional allegiances and managers having a short role-life as they move through the NHS for career advancement, means that truly exploiting opportunities for potential market segments, optimally leveraging resources and developing superior operational capabilities are stunted (Crosson 2003, Nash *et al.* 2003, Cramer 2015).

As stated earlier, four research questions were set:

1. Is there a structured, planned approach, or operations strategy, to plan and implement service or operational delivery?
2. Where and how does behavioural and performance improvement feature as part of that planning?
3. Who is responsible for operationalising and achieving policy and performance objectives within hospitals?
4. Are the specifics of Lean criteria set in place within the NHS and, if so, are they well known and understood at all levels?

Table 5 indicates there is a structured approach to strategy-setting. Participant responses incorporated behaviour, performance targets and monitoring as an integral part of the planning process, thus answering question 2. The findings indicate homogeneity across hospitals regarding the answer to question 3. However, answers to question 4 highlighted greater variations between the hospitals. It appears the benefits of Lean are known - enhanced throughput times; reductions in rework and other quality defects; reduction in inventory and an attack on waste in all forms - and the tools for these are understood in all participating hospitals. However, cost is the driver of performance improvement even though the strategy and service literature emphasises quality (Ferdows and De Meyer 1990, Patricio *et al.* 2008, Smith *et al.* 2010, Wallace 2012, Smith 2013, Makarem and Al-Amin 2014).

Three of the six hospitals have established service improvement teams for the creation of a learning culture geared towards continuous improvement, which is in keeping with Lean's

overarching principles (Womack *et al.* 1991, Jones and Mitchell 2006). However, the findings do not show they differ from the other participants. This means that Lean is not seen as part of a wider remit of operations strategy, despite characteristic 5 in the *Everyone Counts* planning document calling for a step-change in productivity, which Lean, applied holistically, can engender.

The focus for Lean activity appears to be on “components of the production line” rather than “the production line” itself, for instance the patient journey. Lean thinking requires looking laterally across the components of the organisation (Womack *et al.* 1991), as does experiential service design in healthcare (Melton and Hartline 2013, Makarem and Al-Amin 2014). If the idea of the healthcare production line is the patient journey, then the idea of integrating multi-touch points of care aligns itself better with the strategic nature of Lean (Ker *et al.* 2014) rather than its ‘toolkit’ aspect which has taken precedence thus far.

Evidence is presented of hospitals trying to integrate multi-interface service levels and experiences through their work on patient pathways, showing an emergent focus on service quality as advocated by such as Patricio *et al.* (2008), Hagan (2011), LaGanga (2011) and Burgess and Radnor (2012).

Applying the concepts suggested in the operations strategy literature, the starting premise should be the patient experience. This would make performance and service improvement ‘built-in’ rather than a reactive add-on (Ferdows and De Meyer 1990, Hill and Hill 2011). However, the starting point is cost as presented in the CCG-produced contracts at the beginning of each strategic planning cycle, and outlined in the strategy-setting section.

Similar to the improvements in Hong Kong, India and the USA (LaGanga 2011, Chan 2012, Bhat and Jnanesh 2014), performance improvement results are specific to activities and clinical units, as shown with the pharmacy departments noted in Table 5. However, further

research (and probably development work in hospitals) can be carried out to provide a broader perspective around, for example, the extent pharmacy influences the length of stay of a non-elective inpatient, thus going some way towards integrating care and service delivery, and providing patient-centred hospital performance. This would also be in keeping with the characteristics of Lean as listed by Womack *et al.*(1991), specifically regarding integrating production, pulling production in response to customers rather than in-house needs and integrating the complete supply chain.

An important issue, indicative in the way overall strategy is being set in the NHS, is that there is an increasing reliance on a variety of providers for service delivery, working towards the ‘modern model of integrated care’, which is characteristic 3 in the *Everyone Counts* planning document. As the trailblazer for this, Devo Manc⁵ should provide research opportunities to evidence the success of this idea as regards both service quality and cost. In the meantime, the key remains encouraging clinical leaders to develop skills in networking and in working in partnerships. This develops a cultural change to the current silo working, which precludes effective pathway management, and begins the journey of integrated and patient-focused service delivery, as advocated by Lean thinking.

The close vertical relationships required by an integrated supply chain become feasible in a hospital if a patient-centred strategy is adopted. It provides a single focus as well as a spotlight on the elapsed time of the care journey. This is fundamental to Lean’s emphasis on continuous flow and view that waiting time is one of the causes of Muda in service, especially healthcare, environments. Developing such supplier relationships for integrated

⁵ NHS England, 12 NHS Clinical Commissioning Groups, 15 NHS providers and 10 local authorities have a framework for health and social care - with plans for joint decision-making on integrated care to support physical, mental and social wellbeing in Greater Manchester (<http://www.agma.gov.uk/gmca/gmca-devolution-agreement1/caring-for-gm-together/index.html>)

care allows cross-fertilisation of skills, collaborative working and increased influence laterally, across an organisation or a patient journey, and encompasses the operations strategy areas of value, process, capacity and technology management as noted by Brown *et al.* (2013).

The above discussion leads us to offer a summary in the following Table:

Table 6: Key Terms in this Research and their meaning within Healthcare (NHS)

| Key Terms | Application within the NHS |
|---------------------|--|
| Operations Strategy | Although the term, operations strategy, is used within healthcare, its meaning is not the same as that contained within the operations literature. There is very little in terms of shared processes across hospitals; and what operations strategy contains is peculiar to each hospital even though it is supposed to be an adherence to a wider understood top-down initiative. There needs to be better understanding about how operations strategy might: a) enhance the quality of the patient journey and b) how it might link specifically to Lean implementation. |
| Lean | Lean is not seen as a means to enhance a range of operations capabilities including service quality, reduction of waste, space, lead-times etc. Rather, it is seen as a means of reducing costs. Specific links with wider operations strategy are not fully developed and the criteria for Lean appear to be in terms of financial benefits only. This lack of specific links with operations strategy robs the NHS of the full benefits that might be gained through world-class, Lean implementation |

Both terms need fuller and wider insights and this could be gained by undertaking more in-depth research within the NHS - as well as within healthcare on a global scale.

LIMITATIONS AND CONCLUSIONS

Further empirical work on links between operations strategy and Lean and their application to healthcare globally would be useful. Although there are issues peculiar to the NHS, many of the challenges are consistent with those facing healthcare providers globally. For example these findings resonate with the comments of a CEO of a large Healthcare provider in Georgia, USA:

“When I think about our work as leaders in healthcare, I think about three simple yet comprehensive aspects: strategy, operations, and people—with people being the most important. A COO should focus on all three, but his or her main job is to translate the strategy of the organization as defined by the CEO into an implementable, workable framework.” (O’Connor 2014:390)

Thus, although the nature and sources of funding, as well as private-versus-public sector differences are understood across nations, the challenge for healthcare providers to offer the best possible service within pre-determined resources is universal. For this to happen, specific operations strategies need to be in place which can include a range of initiatives, notably Lean. Lean is well-known throughout the NHS. *Lean tools* are implemented in order to try and achieve already identified issues in specific areas, sometimes supported by external agencies or networks. However, the degree of *Lean thinking*, as part of a wider operations strategy, to engender long-term sustained cultural and behavioural change, is not common across hospitals.

Even though cost rather than quality continues to be the key driver (Alderwick *et al.* 2015), contrary to the exhortation of Jones and Mitchell (2006) and Ferdows and De Meyer (1990), there is a movement towards a longer-term view, expressed in Toussaint and Berry’s (2013) ‘6 characteristics’ and in the evolution of strategy development in the NHS. This process was helped in part by The *Productive Series* - an initiative developed by NHS Institute for Innovation and Improvement. This institute has closed but The “Productive Series” continues to be supported by NHS accredited ‘delivery partners’.

However, although strategy is still developed top-down and improvement initiatives are a bottom-up response to centrally-set targets, the development of themes and the increasingly inclusive translation of strategy into implementable plans, indicate that a positive commitment to long-term sustained performance improvement, as advocated by Lean thinking, may be possible in the UK NHS. Although other countries simply cannot ‘copy’

what is practiced in the NHS - with public-versus-private funding and other stakeholder issues being at the forefront of such debate - there is one key finding that can be transferred: Lean has to be seen as part of wider operations strategy. Moreover, this operations strategy needs to be seen as Lean's main driver. Lean within healthcare has to move beyond mere cost reduction processes and, instead, embrace the parameters and criteria first advocated by Womack *et al.* (1991), e.g. enhanced throughput times and an attack on 'waste' in all forms. These, in turn, may lead to cost reductions but they are not the drivers for such Lean pursuits or for enhanced patient care. Undoubtedly there are some indications that the pursuit of Lean is worthwhile in healthcare –as noted earlier with LaGanga's (2011) research in outpatient service operations in the USA. However, what becomes clear from this research is that if the full benefits are to be realised, Lean capabilities need to be seen as the *outcome* - and not the driver - of operations strategy. The difficulty encountered when interviewing senior-level staff is that although they understood elements of operations strategy and Lean, they struggled in being clear about the 'fit' between them and how the perceived outcomes would be realised. Each participating hospital practised the criteria identified by other research but because the implementations were in "piecemeal sections", the overall success could not be seen in the way Jones and Mitchell (2006) believed was possible.

Responsibility for operationalising and achieving Lean capabilities does not yet emanate from a strategic or cultural imperative for improved service delivery, nor is it yet fully developed.

Evidence suggesting that 'best practice' either for the patient experience or organisational effectiveness being disseminated across the NHS is sparse, despite the much-lauded successes of Salford Royal and Bolton (Radnor *et al.* 2012). Thus, although Lean may be

attractive for Healthcare at a micro level, the full strategic benefits of Lean, and not costs savings only, are not able to be realised.

This research supports the findings cited earlier of Carlborg *et al.* (2013) who found difficulties in reconciling ‘standardised services’ and increasing reliability in service processes through Lean principles. It extends the cited work by making the research focus the strategic planning process within the NHS. From the sample, the conclusion is that there is not perceived to be ‘one best way’ for devising and implementing Lean within the Health Service. The very nature of the ‘life-and-death service’, as one of the senior-level managers noted, makes the stakes high for “getting things right” at the point of delivery, but the whole process is defined, and ostensibly inhibited, by ongoing financial pressures. Gaining buy-in and acceptance from a range of stakeholders, and disseminating Lean processes on a national level and within the context of a cohesive operations strategy, remain challenges for the NHS.

Unsurprisingly, this research is limited by its scope. The purpose was to ascertain the degree to which senior-level NHS personnel really understood what Lean was and if they knew the range of operations criteria that could be applied in Healthcare. This objective has been achieved. However, much deeper investigation is required especially regarding any breaking down of silo working, progress towards integrated care and any consequent change in productivity and care quality. These findings will help to promote the formulation and testing of further research into strategic operations and Lean, including the role of operations strategy. Such research could involve additional detailed case studies, longitudinal research of selected hospitals, and multiple-case studies of groupings of hospitals based on their performance rankings, as this research encompassed. Given the scope and size of the Healthcare sector, further empirical survey work is also to be encouraged.

REFERENCES

- (2010) Health Landscape Review. *Public Accounts Committee*. Oral evidence taken before the Public Accounts Committee, Una O'Brien and Sir David Nicholson ed. London, Houses of Parliament
- The Health and Social Care Act 2012* (c. 3/2012 19978 19585) UK: The Stationery Office. Available from: http://www.legislation.gov.uk/ukpga/2012/7/pdfs/ukpga_20120007_en.pdf (Accessed: 25th September 2015).
- Alderwick, H., Robertson, R., Appleby, J., Dunn, P. and Maguire, D. (2015) *Better Value in the NHS. The Role of Changes in Clinical Practice*. 978 1 909029 53 8. London: The King's Fund.
- Bamford, D., Forrester, P., Dehe, B. and Leese, R. G. (2015) "Partial and Iterative Lean Implementation: Two Case Studies". *International Journal of Operations & Production Management*, Vol. 35 No. 5, pp 702-727.
- Bamford, D. and Griffin, M. (2008) "A Case Study into Operational Team-Working within a UK Hospital". *International Journal of Operations & Production Management*, Vol. 28 No. 3, pp 215.
- Barratt, M., Choi, T. Y. and Li, M. (2011) "Qualitative Case Studies in Operations Management: Trends, Research Outcomes, and Future Research Implications". *Journal of Operations Management*, Vol. 29 No. 4, pp 329-342.
- Berry, L., L. and Bendapudi, N. (2007) "Health Care: A Fertile Field for Service Research". *Journal of Service Research*, Vol. 10 No. 2, pp 111-122.
- Berwick, D. (2013) *Improving the Safety of Patients in England*. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226703/Berwick_Report.pdf (Accessed 9th February 2016).
- Beuster, P. (2011) "Dwp Lean Journey - Improving Customer Service Delivering Efficiency". *Management Services*, Vol. 55 No. 4, pp 8-9.
- Bhat, S. and Jnanesh, N. A. (2014) "Application of Lean Six Sigma Methodology to Reduce the Cycle Time of out-Patient Department Service in a Rural Hospital". *International Journal of Healthcare Technology & Management*, Vol. 14 No. 3, pp 222-237.
- Brown, S. (1996) *Strategic Manufacturing for Competitive Advantage : Transforming Operations from Shop Floor to Strategy*. Prentice-Hall, New York
- Brown, S. (2000) *Strategic Operations Management*. Butterworth-Heinemann, Oxford
- Brown, S., Bessant, J. R. and Lamming, R. (2013) *Strategic Operations Management*. Third ed. Routledge, Oxford
- Burgess, N. (2012) *Evaluating Lean in Healthcare*. Doctor of Philosophy in Business. University of Warwick.
- Burgess, N. and Radnor, Z. (2012) "Service Improvement in the English National Health Service: Complexities and Tensions". *Journal of Management & Organization*, Vol. 18 No. 5, pp 594-607.
- Butler, T. W., Leong, G. K. and Everett, L. N. (1996) "The Operations Management Role in Hospital Strategic Planning". *Journal of Operations Management*, Vol. 14 No. 2, pp 137-156.

- Carlborg, P., Kindström, D. and Kowalkowski, C. (2013) "A Lean Approach for Service Productivity Improvements: Synergy or Oxymoron?". *Managing Service Quality: An International Journal*, Vol. 23 No. 4, pp 291-304.
- Carter, B., Danford, A., Howcroft, D., Richardson, H., Smith, A. and Taylor, P. (2011) "Lean and Mean in the Civil Service: The Case of Processing in HMRC". *Public Money & Management*, Vol. 31 No. 2, pp 115-122.
- Chan, C. K. (2012) "Applying Lean Management to Improve the Pre-Consultation Patient Journey in Outpatient Services: A Hong Kong Case Study". *Asia Pacific Journal of Health Management*, Vol. 7 No., pp 28-33.
- Corley, K. G. and Gioia, D. A. (2004) "Identity Ambiguity and Change in the Wake of a Corporate Spin-Off". *Administrative Science Quarterly*, Vol. 49 No. 2, pp 173-208.
- Cramer, S. (2015) *Creating Stronger Relationships between Managers and Clinicians*. London: Institute of Healthcare Management.
- Crosson, F. J. (2003) "Kaiser Permanente: A Propensity for Partnership". *BMJ*, Vol. 326 No. 7390, pp 654.
- Currie, G. and Lockett, A. (2011) "Distributing Leadership in Health and Social Care: Concertive, Conjoint or Collective?". *International Journal of Management Reviews*, Vol. 13 No. 3, pp 286-300.
- Currie, G. and Suhomlinova, O. (2006) "The Impact of Institutional Forces Upon Knowledge Sharing in the UK NHS: The Triumph of Professional Power and the Inconsistency of Policy". *Public Administration*, Vol. 84 No. 1, pp 1-30.
- de Souza, L. B. (2009) "Trends and Approaches in Lean Healthcare". *Leadership in Health Services*, Vol. 22 No. 2, pp 121-139.
- Dey, A., Sinha, K. K. and Thirumalai, S. (2013) "IT Capability for Health Care Delivery: Is More Better?". *Journal of Service Research*, Vol. 16 No. 3, pp 326-340.
- DoH. (1989) *Working for Patients*. Health. HMSO, (0952-2271).
- DoH (2008) *High Quality Care for All: NHS Next Stage Review*. London: Department of Health.
- Eisenhardt, K., M. (2002) Building Theories from Case Study Research. In: Huberman, A. M. and Miles, M. B. (Eds.) *The Qualitative Researcher's Companion*. Thousand Oaks; London: Sage Publications, pp. 5-35.
- Ferdows, K. and De Meyer, A. (1990) "Lasting Improvements in Manufacturing Performance: In Search of a New Theory". *Journal of Operations Management*, Vol. 9 No. 2, pp 168-184.
- Francis, R. (2013) *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry*. The Stationery Office: House of Commons.
- Gioia, D. A., Corley, K. G. and Hamilton, A. L. (2013) "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology". *Organizational Research Methods*, Vol. 16 No. 1, pp 15-31.
- Graban, M. and Swartz, J. E. (2012) "Change for Health". *Management Services*, Vol. 56 No. 2, pp 35-39.

- Hagan, P. (2011) "Waste Not, Want Not: Leading the Lean Health-Care Journey at Seattle Children's Hospital". *Global Business and Organizational Excellence*, Vol. 30 No. 3, pp 25-31.
- Hamel, G. and Prahalad, C. K. (1994) *Competing for the Future*. Harvard Business School Press, Boston, Mass.
- Hayes, R. H. and Wheelwright, S. C. (1984) *Restoring Our Competitive Edge : Competing through Manufacturing*. Wiley, New York; Chichester
- Hill, A. and Hill, T. (2011) *Essential Operations Management*. Palgrave Macmillan, New York
- Hill, T. (1985) *Manufacturing Strategy : The Strategic Management of the Manufacturing Function*. Macmillan, Basingstoke
- Jones, D. T. and Mitchell, A. (2006) *Lean Thinking for the NHS*. London: NHS Confederation.
- Keogh, B. (2015) *Safer, Faster, Better: Good Practice in Delivering Urgent and Emergency Care. A Guide for Local Health and Social Care Communities*. . NHS.
- Ker, J.-I., Wang, Y., Hajli, M. N., Song, J. and Ker, C. W. (2014) "Deploying Lean in Healthcare: Evaluating Information Technology Effectiveness in U.S. Hospital Pharmacies". *International Journal of Information Management*, Vol. 34 No. 4, pp 556-560.
- Ketokivi, M. and Choi, T. (2014) "Renaissance of Case Research as a Scientific Method". *Journal of Operations Management*, Vol. 32 No. 5, pp 232-240.
- Kleback, C. (2012) *Lean Library Management: Eleven Strategies for Reducing Costs and Improving Customer Services*. (Accessed 2).
- Krafcik, J. F. (1988) "Triumph of the Lean Production System". *Sloan Management Review*, Vol. 30 No. 1, pp 41-52.
- LaGanga, L. R. (2011) "Lean Service Operations: Reflections and New Directions for Capacity Expansion in Outpatient Clinics". *Journal of Operations Management*, Vol. 29 No. 5, pp 422-433.
- Li, L. X., Benton, W. C. and Leong, G. K. (2002) "The Impact of Strategic Operations Management Decisions on Community Hospital Performance". *Journal of Operations Management*, Vol. 20 No. 4, pp 389-408.
- Makarem, S. C. and Al-Amin, M. (2014) "Beyond the Service Process: The Effects of Organizational and Market Factors on Customer Perceptions of Health Care Services". *Journal of Service Research*, Vol. 17 No. 4, pp 399-414.
- Malmbrandt, M. and Åhlström, P. (2013) "An Instrument for Assessing Lean Service Adoption". *International Journal of Operations & Production Management*, Vol. 33 No. 9, pp 1131-1165.
- Mantere, S. and Ketokivi, M. (2013) "Reasoning in Organization Science". *Academy of Management Review*, Vol. 38 No. 1, pp 70-89.
- Matthias, O. and Buckle, M. (2016) Accidental Lean - Performance Improvement in an NHS Hospital and Reflections on the Role of Operations Strategy. In: Radnor, Z., et al. (Eds.) *Public Services Operation Management: A Research Companion*. Abingdon, Oxford: Routledge, pp. 52-73.

- Mazzocato, P., Savage, C., Brommels, M., Aronsson, H. and Thor, J. (2010) "Lean Thinking in Healthcare: A Realist Review of the Literature". *Quality and Safety in Health Care*, Vol. 19 No. 5, pp 376-382.
- Melton, H. L. and Hartline, M. D. (2013) "Employee Collaboration, Learning Orientation, and New Service Development Performance". *Journal of Service Research*, Vol. 16 No. 1, pp 67-81.
- Miller, J. G. and Roth, A. V. (1994) "A Taxonomy of Manufacturing Strategies". *Management Science*, Vol. 40 No. 3, pp 285-304.
- Moyano-Fuentes, J. and Sacristán-Díaz, M. (2012) "Learning on Lean: A Review of Thinking and Research". *International Journal of Operations & Production Management*, Vol. 32 No. 5, pp 551-582.
- Murphree, P., Vath, R. R. and Daigle, L. (2011) "Sustaining Lean Six Sigma Projects in Health Care". *Physician Executive*, Vol. 37 No. 1, pp 44-48.
- Myers, M. D. D. a. (2013) *Qualitative Research in Business and Management*. Second Edition ed. Sage, London
- Nash, D. B., Malcolm, L., Wright, L., Barnett, P., Hendry, C., Crosson, F. J., Atun, R. A. and Thomas, H. (2003) "Improving the Doctor-Manager Relationship". *BMJ*, Vol. 326 No. 7390, pp 652.
- O'Connor, S. J. (2014) "Interview with Ninfa M. Saunders, Dha, Rn, Fache, President and Ceo of Navicent Health". *Journal of Healthcare Management*, Vol. 59 No. 6, pp 390-394.
- Panchak, P. (2003) "Lean Healthcare? It Works! (Cover Story)". *Industry Week/IW*, Vol. 252 No. 11, pp 34-40.
- Papadopoulos, T., Radnor, Z. and Merali, Y. (2011) "The Role of Actor Associations in Understanding the Implementation of Lean Thinking in Healthcare". *International Journal of Operations & Production Management*, Vol. 31 No. 2, pp 167-191.
- Patricio, L., Fisk, R. P., Falcao e Cunha, J. and Constantine, L. (2008) "Designing Multi-Interface Service Experiences. The Service Experience Blueprint". *Journal of Service Research*, Vol. 10 No. 4, pp 318-334.
- Pisano, G. P. and Shih, W. C. (2009) "Restoring American Competitiveness". *Harvard Business Review*, Vol. 87 No. 7/8, pp 114-125.
- Radnor, Z. and Johnston, R. (2012) "Lean in UK Government: Internal Efficiency or Customer Service?". *Production Planning & Control*, Vol. 24 No. 10-11, pp 903-915.
- Radnor, Z. J., Holweg, M. and Waring, J. (2012) "Lean in Healthcare: The Unfilled Promise?". *Social Science & Medicine*, Vol. 74 No. 3, pp 364-371.
- Rifai, A. K. and Pecenka, J. O. (1990) "An Application of Goal Programming in Healthcare Planning". *International Journal of Operations & Production Management*, Vol. 10 No. 3, pp 28-37.
- Ritchie, L. (2002) "Driving Quality - Clinical Governance in the National Health Service". *Managing Service Quality*, Vol. 12 No. 2, pp 117-128.

- Robinson, S., Radnor, Z. J., Burgess, N. and Worthington, C. (2012) "Simlean: Utilising Simulation in the Implementation of Lean in Healthcare". *European Journal of Operational Research*, Vol. 219 No. 1, pp 188-197.
- Samuel, D., Found, P. and Williams, S. J. (2015) "How Did the Publication of the Book the Machine That Changed the World Change Management Thinking? Exploring 25 Years of Lean Literature". *International Journal of Operations & Production Management*, Vol. 35 No. 10, pp 1386-1407.
- Scrivener, R. (2002) *Principles for Best Practice in Clinical Audit*. Radcliffe Medical, Abingdon
- Seddon, J. and O'Donovan, B. (2010) "Rethinking Lean Service". *Management Services*, Vol. 54 No. 2, pp 14-19.
- Silvestro, R. and Silvestro, C. (2003) "New Service Design in the NHS: An Evaluation of the Strategic Alignment of NHS Direct". *International Journal of Operations & Production Management*, Vol. 23 No. 4, pp 401-417.
- Singh, P. J., Wiengarten, F., Nand, A. A. and Betts, T. (2015) "Beyond the Trade-Off and Cumulative Capabilities Models: Alternative Models of Operations Strategy". *International Journal of Production Research*, Vol. 53 No. 13, pp 4001-4020.
- Skinner, W. (1969) "Manufacturing--Missing Link in Corporate Strategy". *Harvard Business Review*, Vol. 47 No. 3, pp 136-145.
- Skinner, W. (1974) "The Focused Factory". *Harvard Business Review*, Vol. 52 No. 3, pp 113-121.
- Slack, N. (2015) Operations Strategy. In: *Wiley Encyclopedia of Management*. John Wiley & Sons, Ltd.
- Sloan, T., Fitzgerald, A., Hayes, K. J., Radnor, Z., Sohal, A. and Robinson, S. (2014) "Lean in Healthcare – History and Recent Developments". *Journal of Health Organization and Management*, Vol. 28 No. 2, pp 130-134.
- Smith, J. S., Fox, G. L. and Ramirez, E. (2010) "An Integrated Perspective of Service Recovery: A Sociotechnical Systems Approach". *Journal of Service Research*, Vol. 13 No. 4, pp 439-452.
- Smith, S. (2013) "Revolutionizing Support Services with Lean". *Industrial Engineer: IE*, Vol. 45 No. 7, pp 42-46.
- Spring, M. and Araujo, L. (2009) "Service, Services and Products: Rethinking Operations Strategy". *International Journal of Operations & Production Management*, Vol. 29 No. 5, pp 444-467.
- Tax, S. S., McCutcheon, D. and Wilkinson, I. F. (2013) "The Service Delivery Network (Sdn): A Customer-Centric Perspective of the Customer Journey". *Journal of Service Research*, Vol. 16 No. 4, pp 454-470.
- Toussaint, J. S. and Berry, L. L. (2013) "The Promise of Lean in Health Care". *Mayo Clinic Proceedings*, Vol. 88 No. 1, pp 74-82.
- Umble, M. and Umble, E. J. (2006) "Utilizing Buffer Management to Improve Performance in a Healthcare Environment". *European Journal of Operational Research*, Vol. 174 No. 2, pp 1060-1075.

- Vegting, I. L., van Beneden, M., Kramer, M. H. H., Thijs, A., Kostense, P. J. and Nanayakkara, P. W. B. (2012) "How to Save Costs by Reducing Unnecessary Testing: Lean Thinking in Clinical Practice". *European Journal of Internal Medicine*, Vol. 23 No. 1, pp 70-75.
- Voss, C. (1996) *Manufacturing Strategy : Operations Strategy in a Global Context*. London Business School,
- Voss, C., Roth, A. V. and Chase, R. B. (2008) "Experience, Service Operations Strategy, and Services as Destinations: Foundations and Exploratory Investigation". *Production and Operations Management*, Vol. 17 No. 3, pp 247-266.
- Wallace, L. (2012) "Lean Library Management: Eleven Strategies for Reducing Costs and Improving Customer Services, John J. Huber. Neal-Schuman, New York (2010), Isbn: 978-1-55570-732-3". *The Journal of Academic Librarianship*, Vol. 38 No. 3, pp 188.
- Waring, T. S. and Alexander, M. (2015) "Innovations in Inpatient Flow and Bed Management: An Action Research Project in a UK Acute Care Hospital". *International Journal of Operations & Production Management*, Vol. 35 No. 5, pp 751-781.
- Womack, J. P. and Jones, D. T. (2003) *Lean Thinking : Banish Waste and Create Wealth in Your Corporation : Revised and Updated*. [2nd ed. Simon and Schuster, New York
- Womack, J. P. and Jones, D. T. (2005) *Lean Solutions : How Companies and Customers Can Create Value and Wealth Together*. Simon & Schuster, London
- Womack, J. P., Jones, D. T. and Roos, D. (1991) *The Machine That Changed the World*. HarperPerennial, New York, NY
- Zomerdijk, L. G. and Voss, C. A. (2010) "Service Design for Experience-Centric Services". *Journal of Service Research*, Vol. 13 No. 1, pp 67-82.

APPENDIX A: SEMI-STRUCTURED INTERVIEW – OPERATIONS STRATEGY IN THE NHS

(Background and Role – of participant)

1. Strategy Development

1.1 What are the drivers of strategies in the NHS?

i. Who devises them?

ii. What is their purpose?

1.2 How do the overall strategies become operationalised into an Operations Strategy?

1.3 Does the Operations Strategy evolve or is it mandated top-down?

1.4 Who is involved in developing the Operations Strategy?

1.5 What are the key content areas?

2. Operations Strategy Implementation

2.1 Who is responsible for implementing Operations Strategies?

2.2 How are they implemented?

2.3 Is implementation monitored?

2.4 How is the ongoing information captured when implementing new/existing strategies?

2.5 How is the information used?

3. Operations Strategy and Lean - performance improvement/continuous improvement

3.1 What are you seeking to improve? (throughput time, quality of service, re-work)

3.2 To what degree does Lean influence thinking?

3.3 Is Lean part of the process of a strategy being devised and implemented?

3.4 At what level does this take place?

3.5 Is private healthcare seen as a competitor? – Are they concerned about the growth of private healthcare?

3.6 To what extent does the private sector influence what the NHS does?