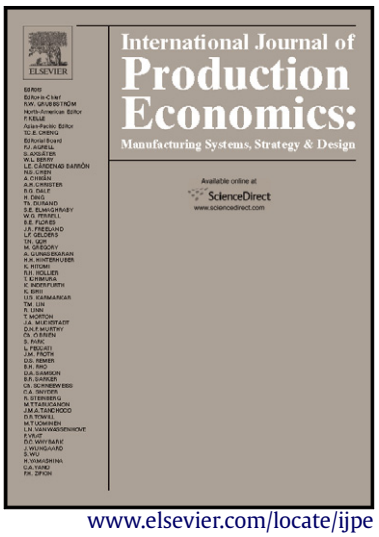

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Applying Lean principles to the design of healthcare facilities

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Abstract

The National Health Service (NHS) in England has a capital budget of approximately £4bn per year to spend on the construction and refurbishment of new and existing buildings. The majority of capital costs are committed by early stage design decisions, which have a large impact on operations, costs and performance. It is necessary to incorporate a sociotechnical approach to design as healthcare is a service environment in which patients are part of the system. The design of facilities determines the allocation of space and the interacting flows including: patients, clinicians, visitors, medication, supplies, equipment, and information. The design requires many trade-offs and has a major impact on the patient experience and the quality and efficiency of care. This paper evaluates the application of the Lean 3P (production, preparation, process) participative design method as part of a pilot project to design a new endoscopy unit at Gateshead Health NHS Foundation Trust. The research, which was funded by the Health Foundation, used participant observation, and an analysis of the layout drawings and the 7 flows of medicine to appraise 3P. The existing and proposed designs were compared. The results show that 3P is an effective tool that can develop designs that meet the requirements of multiple stakeholders. A framework was developed that positions 3P within the overall design process. The seven flows of medicine classification was extended to include subcategories and to identify interrelationships between the flows. This will help inform the design of healthcare facilities.

Keywords: Healthcare, Facilities Design, Participatory Design, 3P, Endoscopy

1 Introduction

National Health Service (NHS) England has an allocation of £95.6bn for the financial year 2013/4 (www.england.nhs.uk). However, it is required to realise £20bn of efficiency savings by 2014/15, which will be reinvested to support improvements in outcomes and quality (Department of Health, 2010a). In 2010/11 the NHS estate was valued at £40bn, making it the largest property holder in the UK public sector. The annual estates running cost was £7bn (Department of Health, 2013c). However, the need to reduce estate running costs and carbon emissions was identified in the 2010/11 operating framework (Department of Health, 2009). The total capital budget is approximately £4bn, which is spent on improvements to premises or the development of new premises. Staff costs comprise around 65% of expenditure for a typical hospital, with premises accounting for approximately 5% (see for example, GHNFT, 2013, p.29). Thus, the majority of expenditure is on staff, with premises representing a relatively small cost in comparison.

However, the design of facilities can have a large impact on efficiency and outcomes. A study conducted in 36 US hospitals found that nurses spent 19.3% of their time on patient care activities; whilst the median walking distance covered by a nurse on dayshift was 3 miles (Hendrich et al., 2008). In terms of health outcomes, PWC (2004, appendix 1) provided a comprehensive review of research that investigated improvements that could