

Lean information management: Understanding and eliminating waste

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Abstract

This paper deals with the development of a new approach for supporting the improvement of information management and the overall information systems infrastructure. In particular, the paper discusses the application of lean thinking to information management; where information management can be considered to involve adding value to information by virtue of how it is organised, visualised and represented; and enabling information (value) to flow to the end-user (customer) through the processes of exchange, sharing and collaboration. The potential benefits of lean thinking are discussed and the fundamental barriers for its application to information management are highlighted. These include the need to characterise the nature of waste and establish the five principles of; value, value streams, flow, pull and continuous improvement in the context of information management. It follows that the core contribution of this paper is the development of an understanding of these critical elements and the creation of a conceptual framework for a set of lean principles within the context of information management. This framework offers a unique and arguably generic approach for supporting the retrospective improvement of information management systems and the overall information systems infrastructure.

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1. Introduction

Information and systems for its management are critical elements for the efficient and effective operation of today's knowledge dependent organisations. From an organisation's perspective the objective of information management is to ensure that valuable information is acquired and exploited to its fullest extent (Willpower Information, 2005). The activities of information management can be considered to involve the creation, representation, organisation, maintenance, visualisation, reuse, sharing, communication and disposal of information (Larson, 2005; Treasury Board of Canada, 2005). At a more conceptual level these elements can be considered to involve adding value to information by virtue of how it is organised, visualised and represented, and enabling information (and hence value) to flow to the end-user through the processes of

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exchange, sharing and collaboration. Furthermore, it is desirable that these elements are performed efficiently with the minimum of waste.

Because of the critical dependency of organisations on information, improving its overall management can yield significant operational benefits to all areas of an organisation and importantly its overall efficiency, competitiveness and responsiveness (Chaffey & Wood, 2004; Dietel, 2000; Moran, 1999). Such improvements generally involve either expanding the amount of information managed or implementing an additional or new information management system. These information management systems or information systems (IS) are generally commercial off-the-shelf (COTS) software applications or suites that are based on standards, languages and processes and include a variety of tools and methods to support the specific activities of information management. In a modern organisation there will be a large number of different systems including finance, payroll, customer relationship management (CRM), product data management (PDM) and inventory management systems. This set of IS or software applications form a complex system which in itself needs to be well aligned to the organisation, efficient and also responsive. Because of this, information management systems that are not well aligned to the organisation or the existing IS infrastructure can have a significant detrimental effect on the organisation and its performance. To alleviate some of these issues there are a variety of methods for determining the information that needs to be managed; a wealth of tools for managing particular types of information; a range of integrated information system suites; and various techniques to support IS planning and the assessment of alignment, fit and user satisfaction; there are however few techniques specifically aimed at improving the efficiency and responsiveness of the overall system or infrastructure.

In contrast to the lack of supportive methods for improving the overall information management system or infrastructure, there are a number of well established techniques that support continuous process improvement of manufacturing and production systems. In general the approaches aim to increase production efficiency (productivity) and quality, and reduce work-in-progress, stock levels and unnecessary product handling. Such improvements can ultimately realise increases in profitability and improve manufacturing flexibility, capability and responsiveness. The most widely adopted approaches include the philosophy of lean thinking (Womack, Jones & Roos, 1990) and the Kaizen (Imai, 1986), single minute exchange of die (SMED) (Shingo, 1985), Six Sigma (Pyzdek, 2003) and design for changeover (DFC) (McIntosh, Culley, Mileham, & Owen, 2001) methods. With the exception of lean thinking these methods can be summarised as frameworks and techniques that focus on improving processes and practices (Kaizen and SMED), product quality (Six Sigma) or changeover performance (DFC). In contrast, lean thinking is a more generic philosophy or framework, and has the potential to be applied to any system or process in order to identify critical areas of improvement and ultimately bring about such improvements. The principles of lean involve eliminating waste and ensuring value flows, which arguably reflect the conceptual model of information management previously proposed. Fundamental to the successful application of lean is the identification of value, understanding of flow and characterisation of waste. In the areas of manufacturing and production the underlying nature of waste is generally well understood and usually visible. However, waste within the context of information management is less clear and not generally as visible. Therefore, prior to the application of lean principles to the processes associated with information management, it is first necessary to develop an understanding of waste within the context of information management and characterise the types of waste present within the overall information management system and infrastructure.

In order to develop an understanding and a theoretical basis for the application of lean thinking within the context of information management this paper discusses the development of a model of waste and the key principles for lean information management. The paper firstly discusses techniques for improving information management and highlights the need for more fundamental approaches that support the overall improvement of the information management system. It then introduces the concept of lean thinking and discusses its evolution and application to processes beyond that of traditional manufacturing. Following this, the underlying nature of waste within the context of information management is characterised and then mapped to the key issues for information management within small to medium-sized organisations. The understanding of waste is then discussed with respect to the traditional model and methods associated with lean manufacturing and the principles of a lean information management strategy are proposed.

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