

International Conference
on Industrial Engineering and Systems Management

IESM' 2009

May 13 - 15, 2009

MONTREAL - CANADA

Analogy between medication-use process and assembly system

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Abstract

The medication-use process in a hospital consists to prepare the drugs for each patient every day. In this paper we present how to conceptualize the medication-use process in a modern hospital where some operations could be made by robots. First we show that there is a close analogy between the medication-use process and an assembly system. The assembly of parts to become a product can be compared to an addition of medication in a preparation of a prescription for a patient. Then, we will show that we can use the results and concepts of the industrial engineering systems to design and to optimise the organisation of a hospital's pharmacy. In order to help the pharmacists to make up their decisions, we propose a modelling of the close-loop medication process with the Japanese Industrial Standard JIS Z 8206, and we propose a strategy of deployment. Finally, we will show an example of application of our approach.

Key words: Health services, Flexible manufacturing systems, Medication-use process

1 Introduction

The official recommendation document "Informatisation du circuit du médicaments dans les établissements de santé"¹ [1] indicates the need to reduce the amount of work time spent by nurses in the medication administration process, and to reduce the medication consumption. The main issues that impact hospital systems are similar to those that we find in manufacturing systems and are primarily related to their sizing, to the understanding of their mechanisms, to the improvement of their productivity and to their performance evaluation. The New Hospital of Estaing (NHE) which will open at the end of 2009 will be established by the move of the current "Hôtel Dieu", a part of the Clermont-Ferrand hospital. The construction of a new hospital allows rethinking its entire organisation. The robotic system will be installed with the aims of reducing dispensing error rates and releasing pharmacy staff to manage medicines at care unit level. The aim of this paper is to propose a methodological approach to analyse and to design the management organization in health care system and especially the closed-loop medication process in a context where operations could be performed either by human operators or by robots. Therefore, the

¹ Computerization of medication-use process in health institutions.