Towards an Integral Operating Room Management System

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Abstract— the effective management of the surgical block in a hospital is the one that allows the timely realization of scheduled surgical interventions while rapidly taking into account the emergencies and this by disrupting as little as possible the scheduling already in the course of execution. This management is one of the key elements to optimize the performance of this activity.

At this stage of the development of the surgical blocks management, this question of management in its integral form has very rarely been addressed. In spite of this, this question remains essential to achieve good management that achieves the overall goal of hospital services namely “improve patient health services while controlling costs".

This part focuses on the study of an hybrid control architecture to manage a surgical block. The proposed control architecture is intended to be:

- Overall "optimized" to ensure good overall performance for a surgical block. (Reduction of the average cost, late overtime reduction),
- Locally reactive to enable scheduled surgical procedures to be performed on time, while allowing uncertainty to be treated (such as a significant delay in completion or a emergency surgery) and to deal with frequent disturbances (such as invalidity of resources).

In consequence, from a management point of view, two main issues are considered:

1/ a methodology, which combines a pragmatic approach with a design aid tool, aims to generate a performance **evaluation system**. An approach that allows the successful realization of the triplet "objective - action - measure" which is a fundamental element of performance optimization.

2/ a study and establishment of a methodology applicable to the organization of process activities, aims to set up a **management system** that acts on the scenario and then on the qualification of the activity. The objective is twofold: to optimize the overall performance of the "operational" process and to increase its responsiveness to disturbances.

More precisely, this part concerns the study and development of hybrid control architecture for managing the surgical operating rooms process. This control is hybrid in the sense that, this architecture is composed of two levels (global with "hierarchical control" and local with "a cooperative steering"). The management system will include policies that optimize global and partial performance and local responsiveness. Indeed, the control demanded by the health services is that which is able to cope with **the uncertainties and disturbances inherent in the process of surgical blocks.**

Keywords— Dynamic planning, Management system, Operating Theater, real time scheduling.