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# Modeling of Production Lines Systems with Layout Constraints

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**Abstract :** There are problems with estimating time of product process of products, especially when there is variable serving time, like control stage. These problems will cause overestimation of process time. Layout constraints, reworking constraints and inflexible product schedule in multi product lines, needs a precise planning to reduce volume in particular situation of line stock. In this article, by analyzing real queue systems with layout constraints and by using concepts and principles of Markov chain in queue theory, a hybrid model has been presented. This model can be a base to assess queue systems with probable parameters of service. Here by presenting a case study, the proposed model will be described. so, production lines of a home application manufacturer will be analyzed.

**Keywords :** Queuing theory, Markov Chain, layout, line balance
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