Abstract: In this talk, we investigate the type and amount of flexibility that is needed in retail and service systems; this is a classic management problem. Let "level-k" flexibility refer to a resource's ability to process \( k \) different types of products. Previous literature has shown via simulations that using only level-2 flexible resources in a special configuration called chaining achieves almost all the benefits of total flexibility.

Using an exact marginal value analysis, for products with general demand distribution but equal margins and shortage cost, we find that the optimal configuration invests in at most two levels of flexibility. Further, these levels are adjacent. In most practical cases, this configuration reduces to tailored pairing, that merges and extends the concepts of chaining and tailoring. This configuration invests in dedicated resources and bi-level flexibility, but not in level-k>2 flexibility, let alone full flexibility.