Holiday Retirement Case

In this case, the author focused on senior-housing rental market, and modified the archaic pricing decisions through revenue management. RM in a senior-living community could be viewed as matching supply (available units (or apartments)) and demand (customer requests). They conducted a project to help the pricing process be comprehensive and granular. It had 3 major phases:

1. Rent Optimization and Proof-of-Concept Analysis, ensuring that Prorize had deep understood of the business factors, along with RM development and usage.
2. Live Pilot Using an Offline RM System to Confirm Benefits, including implements of RM to the first 4 pilots, and then made comparisons.
3. Product Development for Full Automation and Integration, allowing Prorize to automate the end-to-end process, and the resulting application was the Senior-Living Rent Optimizer (SLRO).

The RM system emphasized on value-based selling from customers' needs and amenities, and finally came up with a solution with automated ETL processes. Their efforts resulted in huge financial and business impacts, like revenue lift with higher increase rate than before, more confidence in price negotiation for sales team, and potential to applications in other companies and industries.

UPS Case

In this case, the author focused on delivery route optimization, with new planning paradigm to satisfy its increasing needs. "On Road Integrated Optimization and Navigation" (ORION) was developed then, which now tells its 55,000 U.S. service the sequence for pick-ups and deliveries.

UPS deployed package-flow technologies (PFT) system, and the ORION project was initiated to execute the first phase of algorithm development and integration. ORION was implemented as Traveling Salesman Problem with Time Windows (TSPTW) at its first attempt. It was difficult to be usable and ended in failure. In Round 2 they added practical constraints, bounds obtained from delivery history, to TSPTW formulation. After testing and comparison, it was used in 2008 and fully integrated in 2014.

The impact of ORION may be categorized as: (1) financial impact to UPS with more savings ($300 m to $400 m annually) than costing ($295 m). (2) nonfinancial and indirect 5 impact, for drivers, eco-system, and UPS itself to maintain workforce, add service, better pricing. (3) impact on the OR profession and other organizations, such as attracting medias.

Kroger Case

In this case, Kroger Operations Research (OR) team faced several challenges in its quest to apply traditional analytic methods to solve the pharmacy inventory problem, like business resistance to complicated inventory formulas, accurately describe pharmacy demand distributions, etc.

Towards the challenges, Kroger used Simulation-Optimization Approach for Inventory Management. They used spreadsheet simulation model to mimic the pharmacy periodic inventory system for optimizing the inventory ordering problem. But it was unsuitable nationwide, the they came up the Local Search Algorithm to Optimize the Inventory System. The problem were classified by its continuity. Due to the discrete nature of demand in a pharmacy, they devised a local search-based heuristic to search for near-optimal inventory policies.

The inventory simulation-optimization system had significantly improved customer service, and it had also yielded both tangible and nontangible, financial and nonfinancial benefits for the pharmacy division, like revenue increasing, labor saving, inventory reduction as tangible financial benefits, along with nontangible benefits to customers, etc. It can be transformed into a more general inventory optimization framework for the company's perishable product lines of business, and the success of its implementation contributed back to the growth of the OR team.