Order picking is recognized as the most expensive warehouse operation, especially for picker-to-parts systems. Typically, order pickers are assumed to follow a pre-determined route. However, in practice, deviations from this route occur. This phenomenon, known as maverick picking, adds uncertainty to the picker routing problem and can lead to longer picking times than expected.

Existing literature, based on qualitative research and simulation experiments with artificial data, has indicated the detrimental effect of maverick picking on operational performance. However, a quantitative justification based on real-life data is still lacking. Moreover, recent research has shown that failing to comprehend and incorporate human behavior in order picking models may lead to employee discontent, chronic stress, turnover, and burn-out.

Data on individual order pickers is readily available in many warehouses. Therefore, we propose a data-driven approach to quantify the prevalence of maverick picking and to find patterns that cause it. Firstly, this allows analyzing the real-life impact of maverick picking. Secondly, improved order picking planning models considering these new insights can be proposed.

Order picker deviations can manifest in various ways. We aim to identify and quantify both deviations from the planned pick order of items (e.g., skipped locations due to a congested aisle) and deviations from the expected times at which picks are performed (e.g., alternative travel paths).