Bern University
of Applied Sciences
Business School

Q&A Master thesis, Claude Daniel Wiesner

Efficient routing within the Swiss parcel industry

Develop a model to determine the impact of manual intervention in automated routing and how to discard personal experience versus long-term software expertise

Questions	Answer notime AG	Answer DPD Schweiz AG	Answer Planzer KEP AG	Answer Swiss Post CH AG
Automated planning needs the acceptance of all employees. In your view, what are the main points to ensure that this succeeds and that employees do not try to override the planning in any way?	It's not that hard. But we started from the beginning. The system calculates from manual starts and then it calculates the tours. Corrections are only made if there are too many packages on the tour. The tour planning and algorithm works very well for tours with high stop density. Drivers are used to being remotely controlled. Only a minority complain about the tours. Algorithms are there to reduce times.	It depends on the business model. DPD works with subcontractors and has only limited authority. Therefore, the drivers have freedom in the tour depart, but the planning is predetermined. DPD defines zones and the subcontractor defines the flow in the zones. DPD optimizes the entry point, stops, and exit point. The driver can turn 1, 2, 3 into 1, 3, 2 and define the direction of the tour. Overdriving is not possible.	Apart from obvious errors that are corrected manually, the conviction must be conveyed that the software outputs a good result. The own opinion and conviction should be put in the back.	Even now, planners can only intervene to a limited extent if, for example, a car is too full and certain packages should be placed on another road. For us, manual intervention is part of the job, and if the planner saves 5 or 6 minutes per travel time in his area, it's worth it. But trust in the software is already a big issue for us.
Will Swiss parcel delivery companies still have manual planning steps in 2 years?	Yes, simply because service providers must do more and more, and ETA is becoming more and more important. The algorithms are not built for this and the inefficiency at the delivery windows is still too big. Probably everything will be automated for standard tours.	Yes, to allow the manual accesses, but only limited and the possibilities are given. Thus, the daily interventions become only an exception.	There will probably still be manual steps, but these will only have a placebo effect. It will be possible to intervene, but no longer has any effect on the planning. Nevertheless, Planzer improves the last mile with recordings stops and foot ways as well with a learning system to implement the driver’s behavior.	Depending on the calculation time, the planner has a time window of 1 to 3 hours to check the planning and make interventions. The time window is already limited. In addition, we are working on recording vehicle stops to improve planning and reduce interventions.
Where do you see further important efficiency improvements in parcel delivery?	Cooperation opportunities with partners becomes inevitable because the costs become too high for everyone.	Leaving drivers in the same core area and still reallocating areas daily based on volume without overloading a vehicle.	Generally, use existing data to provide better customer services. For example, using delivery data to work out customer bundling.	Area knowledge is hugely important to us and driving the same areas with the same driver every time is very important to us and contributes a lot to efficiency.
How will the tasks of planners change in the next two years?	Not in two years, but in general I hope that OMs in this form no longer need. Planning is no longer limited to the tour, but to the whole process of personnel, vehicle, and volume planning.	Has been in flux at DPD for four years. There is a dedicated team that takes care of the drivers' concerns. The challenge for the planning team is to continue to be up to date with IT technology and at the same time to develop empathy for the driver team with remaining objective.	The planner should become more of a team leader and the existing knowledge of the territories, delivery locations or delivery process will be used to make quick decisions on delivery issues or to improve customer service.	As part of green logistics, we will deliver to the city centers of Bern and Zurich using electric vehicles. This will be a big change for us.

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Interview with Prof Dr Goos Kant, ORTEC B.V.

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Questions	Answer Ortec
A personal desk research showed, and confirmed is by literature, the most common bad experience of customers is delayed delivery. Is the planning still not good enough or create the companies too high expectations with their announced estimated arrival time?	It depends on the business model and what the relation between planer and driver is. As example: Dutch Post: The delivery is done by sub-contractors. They must have their freedom by law and the goal of the planning is a doable tour in the know area and the driver is motivated to be on time. DPD: The same business model as Dutch Post and they calculate with an accuracy of 30 minutes. DHL: They calculate with time-windows of -20 minutes and +40 minutes, maximum 60 minutes difference. So, in fact: It is possible to deliver within time-windows, but it must be implemented in the business model and to calculate correctly the most difficult constraints delivery stops and traffic. Even with a detailed average value matrix of stops and traffics the prediction of the real situation on the street is seldom accurate enough.
The usual way how the algorithm works is to calculate the fastest route between two points, the maximum possible stops during the working hours and with the challenge that every driver should do his round in the same area because of the detail knowledge about the route. With that mindset do you see any chance to discard personal experience versus long-term software expertise?	The routing software is changing more to keep the driver happy than only get a theoretically optimized round. Happy drivers reduce the manual intervention. For that Ortec wants to involve the behavior of the drivers understand their intention and replace inaccurate average values with the behavior of the drivers. As example: If the routing software on crossing always suggest turning right but the driver turns left and is faster than is it better to implement that know-how into the software.
Everyone who was interviewed emphasized that within the next five years the parcel delivery routing will be completely automized. But at the same time everyone explained how difficult it is to collect the missing data points and currently the manual steps close these gaps. Are the marginal costs of collection too high and the marginal utility of the automatization too low?	Maybe they can implement a learning system to increase the reliability of the results. If the driver wants to change something, she or he must interact with the operator, and they learn from that behavior. This is not only software-related it is as well working as a team. In any case we from Ortec believe with the behavior implementation into routing software the specific area know-how will be less important.
Beside an automated and continuously improved routing, what important efficiency increase in the parcel delivery industry do you see?	The electrification of inner cities vehicles with their lower load weight and smaller maximum range will challenge the logistics companies especially at the transfer point at the city boarder. Unplanned pick-ups is another challenge because it follows the customer demand to be as flexible as possible but for the companies it is difficult finding an efficient way to do it.