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Dell Cuts Transport Costs Using Probability Theory

Beyond saving money, the supply routing system developed for Dell by MIT researchers has made the computer maker more nimble in its movement of goods.

By Thomas Claburn, [InformationWeek](#)

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With help from Massachusetts Institute of Technology's Sloan School of Management and advanced mathematics, [Dell](#) has managed to reduce by 60% the amount that it pays to transport [video](#) monitors across North America.

Because of their weight and size, [computer](#) monitors represent a substantial portion of Dell's inbound transportation costs.

Dell enlisted Jérémie Gallien, professor of operations management at MIT Sloan School of Management, and a team of other academics and professionals to improve its cargo logistics system for controlling the movement of monitor-laden shipping containers at sea.

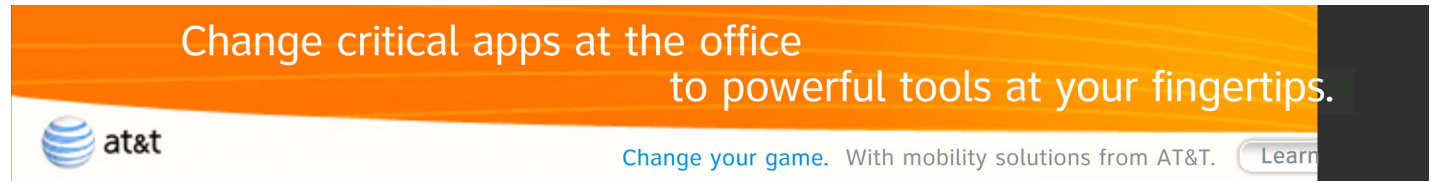
In [a paper describing his team's work](#), Gallien and his co-authors describe the issues Dell attempted to address. "The first was that supply routing decisions (i.e., diversions, transfers, and expeditions) were being made by members of several internal groups within Dell, and that the coordination between these groups only occurred on an ad-hoc basis," the paper explains. "The second root cause identified was that the information relevant to supply routing decisions (at a minimum, the demand forecast, current inventory, and supply pipeline) was scattered, difficult to obtain in a timely fashion, and occasionally unreliable."

According to Gallien, Dell's system, while impressive, relied too much on humans for routing decisions.


Using mathematical modeling techniques, Gallien and his team improved Dell's forecasting abilities. "Before our model, the company would use forecasts, but the reality is that forecasts are never right," said Gallien in a statement. "By using probability theory to quantify the uncertainty of demand forecasts and projected inventory, we have been able to vastly improve and speed up the decision-making process."

Beyond saving on transportation costs, Gallien's system has made Dell more nimble in its movement of goods. "Dell has achieved significant efficiency and organizational gains by relieving supply routing decisions from several uncoordinated groups within Dell and assigning this task to a supply chain analyst who makes routing decisions assisted by the optimization-based model," said Eston Ricketson, director of global materials worldwide procurement for Dell, in a statement. "Dell is working on implementing an extension of this model that generates shipment decisions between a worldwide global hub in Asia and all its manufacturing/merge facilities worldwide."

The techniques pioneered by Dell may be useful to other companies that are looking to improve the efficiency of their supply chains, Gallien's paper suggests.



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