

BREXIT: PREPARING FOR THE WORST SCENARIOS

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ABSTRACT

As UK and the EU are in a critical phase of Brexit negotiations, it is crucial for the transportation and logistics industry to comprehend the full extent of the consequences of Post-Brexit scenarios. In this case, a simulation-based scenario mapping model is developed in collaboration with an Irish food logistics and transportation company to test for the effects of Brexit on company's performance. O'Toole Transport founded in 1996 with one refrigerated vehicle operating from Galway. Now, the company has become the first logistics company in Ireland to be awarded the prestigious BRC accreditation for the cross-docking and distribution of chilled and frozen food.

1 INTRODUCTION

In the event of no agreement between UK and EU, trade between Ireland and UK will, most probably, be subject to customs control. An increase in logistics cost and transportation lead time, in this case, would be inevitable. Daniel O'Toole, a Senior Planning Manager at O'Toole Transport, comments: "We are specialised transport company for refrigerated goods. Having hard borders between Ireland and Northern Ireland is a real risk for our business. Compared to other business models like concrete or steel our products have limited shelf-life time". The company is seeking to better understand the implications of hard borders on products delivery lead time, shelf-life time and additional operational cost. Daniel explains, "I just think that there is so much traffic between Northern and Republic of Ireland every day, we have a lot of traffic going up there seven days a week, and that's concerning me!". For instance, we are loading fresh products from Dublin to Belfast, then from Belfast to Killyleagh, which is about an hour and a quarter from Belfast. We then reload fresh products from Killyleagh and bring it down to cross-docking in our Warehouse in Dublin. Our trucks are then headed down to a customer's central distribution hub in Mitchelstown, in Cork. They do their picking at 5 pm sharp! We are on the bone every day. If the transport team is not there at 5 pm, cut off time, they strike the order off, huge knock-on effect.

2 THE SOLUTION

Freight Transport Association Ireland in collaboration with 3S Research Group, School of Management, Dublin Institute of Technology has led an initiative to develop a scenario mapping tool using simulation technology to evaluate the influence of applying hard borders between Northern and Republic of Ireland. Company managers can use the model to examine risk mitigation strategies in a safe computer environment and test their implications prior decision making. A simulation model is developed providing O'Toole Transport with a better vision of the current business situation and helping the company to design cost and performance optimised strategies under different borders arrangements. The model brings together the transportation routes on an interactive map and a performance dashboard in a single view for a better decision-making experience. A hybrid simulation approach is used to model the transportation routes and

the related borders scenarios integrating discrete event simulation and agent-based modelling. A control over different process parameters is at managers fingertips so they can efficiently test new strategies and extend the analysis to different levels, Table 1. The model not only enables managers to evaluate the business performance in the existence of hard borders but also provides an overview on the business strategies that can improve food delivery lead time, waste quantities and incurred cost. Examples of these strategies are, improving operational efficiency and collaborating with the company's clients to implement flexible cut-off picking times to offset trucks delay on the borders.

Table 1: A List of Model’s Input Parameters and Indicators.

Input Parameters	Shipping		Output Variables	Total Cost	
	Delivery Dates	<ul style="list-style-type: none"> Start Shipping Time Loading/Unloading Time Cross-docking Time Number/Speed of Trucks Delivery Due in the Four Destinations (Belfast, Killyleagh, Dublin Port, Cork) 		<ul style="list-style-type: none"> Operations Cost Cost of Products Waste Cost of Lateness Orders 	Products Quality
Cost	<ul style="list-style-type: none"> Delay Time On the Borders Cost of Pallets Shipping/Freight Cost 	Customer Service	<ul style="list-style-type: none"> Total Over Due Over Due in every destination 		

3 RESULTS

Company managers have acknowledged the vital role of the model in understanding Brexit's impact. Daniel O'Toole explains, "The model could be a real game-changer. Examining our business strategies under different Brexit scenarios is now more effective and simpler". The results show that applying hard borders would have a damaging effect on the business and threaten its continuity. Delaying trucks for one hour on the borders will significantly increase the delay in products delivery and quantities of products waste, which in-turn raises transportation cost and customers dissatisfaction. While improving operational efficiency would mitigate the hard borders risk, achieving flexible cut-off picking times with company's clients would not have the same effect.

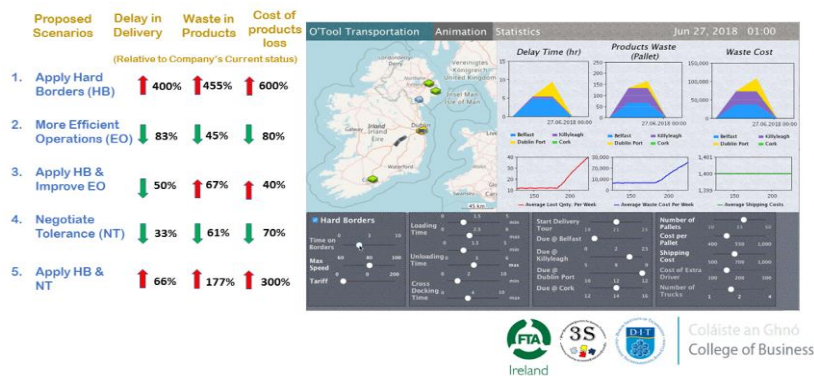


Figure 1: Model’s Parameters Control and Dashboard.

Daniel concluded, “The development of the scenario mapping model is not an end in itself, the model would be extended to include more transportation routes and examine other business strategies”. Considering the fast adoption of information and communication technologies, more advanced features could be brought to the model. With the several advanced analytics and data management technologies, sufficient opportunities are there to bring new features to the model based on real-time information that flows from various external sources such as company's trucks, customs checkpoints and other transportation and warehouse management systems at client's sites.