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Future Supply Networks: Strategizing Locations of Suppliers Based on Software Simulations
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Future Supply Networks: Strategizing Locations of Suppliers Based on Software Simulations

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EXECUTIVE SUMMARY

A simple \$5 T-Shirt you may be wearing will only attract your attention once you have made the decision to buy it. You may look at the tag on the collar that says “Made in China” or “Made in Bangladesh,” but hardly anyone would guess that the T-Shirt may have exchanged several hands, may have traveled the globe through half a dozen countries from the time the cotton was selected till the time it reached your hands. Thanks to globalization, this wonder has been allowed to happen, but at the same time, it has increased the complexity of current supply chains and will continue to do so in the future.

The complexity of the supply chain has grown tremendously, and its management has become a critical aspect, drawing attention from senior executives of most companies. In this thesis, supply chain design software (INFOR) was used to design a supply chain for the apparel industry, and various parameters were tested to find out the main factors that drive the supply networks of today and will do so in the future. Though the apparel industry does not follow the pure dynamics of supply and demand, it is an ideal case to study due to its basic nature as a necessity for humans, its long history, and the reasons that this industry will continue to exist in the future. Unlike computer hardware, which becomes “extinct” after the introduction of more technologically advanced hardware, apparel is here to stay.

Scenario analysis and research on the industry demonstrate certain outcomes that can be used by executives and researchers to take decisions and conduct further studies. Only variable costs were computed, as the objective of the model was to reduce the total variable cost.

- **Labor Cost:** This forms almost 65% of the total variable cost, and thus is the most important driver for the selection of suppliers/manufacturers, and hence the design of the supply chain. No doubt due to China’s and other Low Cost Countries’ (LCC) cheaper labor costs, most of the world’s apparel manufacturing has shifted to these countries. However, apart from low labor cost, these countries also offer quality products and better infrastructure. Newer regions like the Mediterranean and several Sub-Saharan countries are emerging fast as potential manufacturing hubs. Better infrastructure, improving governance together with cheaper labor costs will allow these countries to compete head to head with current export leaders.

- **Duties and Quotas:** It is interesting to note that duties form only a negligible part (less than 1%) of the total variable cost. But quotas on the contrary, are particularly relevant to the apparel industry, for they have greatly affected its shape in the past and will continue to do so in the future. The top two importers - the US and the EU - have imposed quotas and very high duties either to benefit from lower cost or impose restriction on exports from certain countries. The duties can be so high as to make the export completely uneconomic to certain countries, while giving unfair advantage to others. The accession of China to the WTO has forced the US to treat it on par with other countries. However, because the US feels that exports from China can completely wipe out apparel manufacturing in certain categories, duties are being imposed on that country as restrictions.
- **Demand:** In the scenario analysis, demand for apparel was increased in Asia to see the impact on the design of supply network. Given the capacity and terms of trade, the model not only suggested increasing the capacities of Asian suppliers but also compelled opening up of newer suppliers in South-Africa and the Mediterranean countries. The scenario outcome suggests that companies in the future might like to source greater quantities from suppliers to meet the increased demand in their respective regions and will also try to source from other emerging regions to benefit from low cost and geographic proximity.
- **Transportation Cost:** Contrary to popular belief, the cost of fuel is not the main driver of transportation cost in the current global scenario; rather it is mainly driven by the economics of supply and demand. Also, the entire transportation cost was only 0.4% of the total variable cost making it a significantly less important driver. The research indicated extremely high demand from Asian countries. Limited or constrained resources at Asian ports drove the shipping cost up for all the outbound shipments from these ports while the cost of shipping inward was very low.

The outcomes of this thesis can be used in different ways by companies, based on their own supply chain strategies. Certain firms continue to manufacture in-house, while some have outsourced partially, and others completely. It cannot be determined which strategy is correct for the future, but based on this research, it is suggested that the managers and executives further study the extent of the impact of each of these drivers on their own supply chain models.

The other possible upshot for the future is that it is very likely that LCCs like China, India, Mexico, and others will continue to be major manufacturing hubs for another decade until, due to economic developments and other factors, labor costs become higher than those offered by emerging manufacturing centers like countries in Sub-Saharan Africa, the Mediterranean, Russia, and others. These emerging manufacturing hubs have been continuously improving their infrastructure and governance and coupled with their resources, are then going to take a substantial slice of the total exports pie.