1. **What is the role of lead time, transportation costs and production costs in terms of the cost decisions?**

3-4 solid paragraphs please. – use any of the information below if necessary.

1. The bill of material for a bike is as follows:
2. The forecast annual demand for of bikes in the United States is 20,000 units. The order is due within 30 days or a penalty of $0.15 per bike is assessed for every day the order is late. Current production cost is $50 per bike for locally produced in the U.S. We are trying to see if we can find a cheaper global option.
3. If your supply chain goes overseas the additional management administrative overhead cost is $ 20,000 more a year (for phone calls, flying to overseas locations etc).
4. Cross border transportation cost is $1,000 for a full or partial load. Transportation within a country is $500 per load. Container size is 16 x 8 x 8 ft or a total of 1,024 cubic feet. We can assume that there is some loss in packing and the actual space available is 1,000 cubic feet per container.
5. Choose one particular supply chain pattern and cost it out – you may ship sub-components from one country to another. Note that finding an optimal solution might be difficult.
6. Costs to procure/assemble a bicycle.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost ($/unit)** | **US** | **China**  | **India** | **Mexico** | **Korea** |
| Bike | 50 |  |  |  |  |
| Frame |  | 1 | 1.5 | 2 | 2.5 |
| Seat |  | 2.5 | 2 | 1.5 | 2 |
| Handle |  | 2 | 3.5 | 1 | 1 |
| Wheel  |  |  |  |  |  |
| Rim |  | 3 | 2 | 5 | 2 |
| Spokes (per 1000) |  | 2 | 1 | 2 | 3 |

1. Lead times to procure/produce a bicycle. Assume that assembly or subassembly can be done in 15 days irrespective of the volume.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Days** | **US** | **China**  | **India** | **Mexico** | **Korea** |
| Bike | 15 |  |  |  |  |
| Frame |  | 30 | 10 | 30 | 10 |
| Seat |  | 25 | 30 | 40 | 5 |
| Handle |  | 20 | 25 | 25 | 10 |
| Rim |  | 30 | 5 | 10 | 10 |
| Spokes (per 1,000) |  | 21 | 10 | 5 | 5 |

1. Transportation times.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Days (From\To)** | **US** | **China**  | **India** | **Mexico** | **Korea** |
| US | 10 | 35 | 40 | 10 | 20 |
| China | 30 | 10 | 50 | 35 | 10 |
| India | 40 | 50 | 20 | 45 | 30 |
| Mexico | 10 | 50 | 60 | 10 | 35 |
| Korea | 20 | 20 | 45 | 40 | 5 |

1. Volume requirements per unit.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Volume/unit (cubic feet)** | **Number of units** | **Cubic feet** | **Number of containers** |
| Bike | .8 |  |  |  |
| Frame | .2 |  |  |  |
| Seat | .2 |  |  |  |
| Handle | .2 |  |  |  |
| Wheel | .3 |  |  |  |
| Rim | .1 |  |  |  |
| Spokes (per 1000) | .5 |  |  |  |

1. Production cost and time components per unit.

|  |  |
| --- | --- |
|  | **Cost/Time Component** |
| **Country** | **Labor ($/hr)**  | **Hours to assemble a wheel**  | **Cost to assemble a wheel**  | **Hours to assemble a bicycle**  | **Cost to assemble a bicycle** |
| China  | .2 | .2 |  | .5 |  |
| India  | .1 | .3 |  | .6 |  |
| Mexico  | 1 | .2 |  | .6 |  |
| Korea  | 2 | .1 |  | .3 |  |

**Global Shipping Model**



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3-4 solid paragraphs please.