

Cis 331

Technology, Information Technology



Icebergs for Kuwait Icebergs for Kuwait Explore the mess by answering the following Questions. What do we know? Freshwater in Kuwait is scarce hence very expensive as stated in Powell and Baker (2010). Desalinating water from sea is quite costly; it requires a lot amount of oil. What can we assume? We will assume that only large towing ships will be rented to carry maximum of 10, 000, 0000. We will also assume that the towing ship can travel at 1, 3, 5 km/hr, iceberg is spherical and melts with a constant radius. What will the results look like? Towing vessel will travel at 5km/hr and the quantity of the iceberg carry from South Pole will be greater than 6, 054, 466m³. The alternative method will be reasonable and less expensive. Towing of the ice will increase the amount of fresh water in the city. It will contribute to the development of the country since a lot of resources will be saved and hence used in other activities as discussed in Adams (2001).

What information can be brought to bear? Adams (2001) states that we can bear in mind that since water expands upon freezing, 1 cubic meter of ice construct only 0. 85 cubic meter of water. The volume of an iceberg ranges from about 500, 000 cubic meters to more than 10 million cubic meters.

Spherical icebergs shrink over a day at a given distance from the pole and at the given towing speed. The fuel cost used will depend on the size of the icebergs. Submerged portion of an iceberg melt slower than the visible part which changes its size. What can we ask the client? Is the method of any benefit to the city? How long will it take for the project to complete? By how much is the proposed method efficient over the current method? Are there similar questions? Yes; what are some of the factors that manipulate the economics of such scheme? What are the disadvantages of this method?

Formulate one or more problem statements. Adams (2001) argues that spherical iceberg would lose about 0.2 meter of radius per day during transport, this amount increases with the rate of towing and the expanse from the pole. Fuel costs for tow boats depend on various factors; the size of the boat, the speed and the volume of the iceberg being towed. There are differences in rental costs and capacities of towing vessels. Large icebergs will provide more water, but they may take longer and cost more to transport. Small icebergs provide less water but may be more able to move. It is difficult to prove which size to work with; the ice could melt before it reaches its destination hence making to reach to a loss.

What are the decisions, outcomes and relationships in the problem? The decisions include installing the most effective means of towing ice, developing means of capturing the water that could melt on the way to reduce waste. Determine the relationship between the times it takes to complete a project and the number of people assigned to work on it. The relationship between the effectiveness of towing ice and amount spent on the project as in Adams (2001).

Draw an influence chart for the problem. If we calculate the final volume of the iceberg and multiply by the price of water, then we can compute an initial estimate of the value of the project.

What modules will we need to build? According to Powell and Baker (2010) the modules required will involve several activities. Determine the delivery of icebergs at the border of the ice cap in Antarctica by size and shape.

Determine how large the iceberg is when it arrives in Kuwait, given its size and shape at the start of the trip, the speed at which it is towed and melting

rates. Convert the iceberg into a certain quantity of drinking water and a corresponding economic value. The modules' simplicity is its strength and not its weakness.

What are the key relationship in the problem draw their graphs. The size of ship, amount of the icebergs, and the daily rents; the Kilometers covered, quantity of the water produced and fuel cost per \$ KM. The graphs have a linear relationship as argued in Adams (2001).

Towing vessel data

Ship size

small

medium

large

Daily rental \$

400

600

800

Maximum load c. u meter

500, 000

1000000

10000000

Current volume c. u per meter

Speed

100000

1000000

10000000

1KM/HR

8. 4

10. 5

12. 6

3

10. 8

13. 5

16. 2

5

13. 2

16. 5

19. 8

What are the parameters of the problem? As stated in Powell and Baker (2010) the restrictions of the problem include the final cost to the initial size of the iceberg, the towing speed, and the size of the boat and changes in speed over the trip. $\text{Cost} = \text{daily rent} - \text{Fuel} \times (\text{Distance})$.

References

Adams, J. L. (2001). *Conceptual Blockbusting*. Reading, MA: Addison-Wesley.

Powell Stephen G and Baker Kenneth R. (2010). *Management science: the art of modeling with spreadsheets* . Hoboken, NJ [u. a.]: Wiley