

The Internet and the Collapse of the Gravity Model

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The gravity model for spatial interaction has served generations of geographers as both an explanation and predictor of movement of people, goods, services and communication between nodes of significant populations. In the model, $S = (P_1 \times P_2) / D^2$, S is the relative spatial interaction, P_1 is the population of the first locality, P_2 is the population of the second locality and D is the distance between the two localities. One of the reasons this general relationship has been so workable is that D can be measured in actual distance (miles, kilometers, etc.), cost or time.

Prior to the invention of the telegraph, all communication occurred at transport speed. You could communicate with someone else in the world as fast as the horse or ship could carry you or your letter. With the invention of electronic communication via telegraph and then telephone, etc., the time it took for communication decreased to the instantaneous. However, the cost of this form of spatial interaction was still a function of distance. A long distance call to Asia costs more than a call to the next city. Thus the gravity model was still valid because D could still be considered a variable as distance was measured by cost.

With the internet this is no longer true. As it currently works, once you've paid for an access fee, you can communicate with Peru and Peoria for the same cost. Thus the standard measurements of D as actual distance, time or cost become meaningless. As far as the internet is concerned, the gravity model is now $S = (P_1 \times P_2)$. As technology improves, expands and computer servers become more efficient, one can envision one computer handling billions of interactions from all over the world. Thus the element of P (the computer) may approach unity.

In broad geographic terms, the implications of the development are enormous. In the past, spatial interaction was directly affected by affluence, cultural inclusion or exclusion, actual physical location and the total infrastructural transport/communications network. This is no longer true. Except for access fees and basic equipment, the internet is totally blind to time, distance, cost, race, religion, nationality and most especially, economic status. Access to communication and information is no longer a function of personal wealth. However, access is still limited by language. As much as other societies may object, the dominant language on the internet is English. So the spatial interaction model will have to be rewritten with a factor 'E'.