Visioning Local Futures: The development of a computerized tourism planning support system

Peter A. Johnson[1], and Renee Sieber[1]

1 Geography, McGill University, peter.johnson2@mail.mcgill.ca
2 Geography, McGill University, Renee.Sieber@mcgill.ca

Abstract

This presentation describes the development of TourSim, an agent-based model (ABM) used to visualize and experiment with tourism planning scenarios. ABM is an approach to modelling complex, dynamic and interacting systems that can be used to generate scenarios showing the outcome of a variety of policy changes. The Canadian province of Nova Scotia is used as a setting for a planning scenario showing the effects of port of entry on tourist dispersion. TourSim is evaluated in the context of three potential areas of adoption constraint; awareness of and experience with ABM, technological considerations, and overall fit with planning tasks. The path of further development of TourSim and of ABM-based planning support system (PSS) is discussed.

Background and Relevance

Planning for tourism development is a complex undertaking, as it affects processes involving multiple individuals interacting over time and space. Traditional approaches to tourism planning have focused on past-performance evaluation of individual impacts, rather than examining system changes and effects. If tourism planners incorporated a system-wide perspective into their planning activities and change scenarios, better decisions could result (Hall, 2000; Jamal, Borges, & Figueiredo, 2004). PSS, and in particular ABM, is one way to incorporate these concepts within tourism planning practice.

Methods and Data

TourSim is an ABM-based PSS, designed to simulate the interactions between tourists and destinations in the Canadian province of Nova Scotia, providing a tool to help policy makers visualize and evaluate potential courses of action. Construction of the TourSim model followed an iterative process, building from a very simple model, adding variables and interactions (Bankes, Lempert, & Popper, 2002). This method was intended to create the simplest model possible that still provided for a generally realistic view of tourism dynamics (Gilbert & Troitzsch, 2005; Grimm & Railsback, 2005). Agent behaviours included in the model represents the basic components of the tourism system, namely tourist demand in the form of accommodation and activity preferences. The landscape on which these agents interact is made up of the corresponding supply of accommodation and activity at each destination. Tourist agents are based on data from the domestic Canadian Travel Survey (CTS), collected from 2000 to 2004, and

International Travel Survey (ITS), collected from 2001 to 2004, both products of Statistics Canada. TourSim is used to develop a scenario showing the effects of changing tourist port of entry on tourist dispersion throughout Nova Scotia. This scenario forms the basis for evaluation of TourSim as a PSS.

Results

Results from the TourSim port of entry scenario show that variation in the percentage of tourists entering at a particular destination generates system level effects. Not only do the destinations where ports of entry values were altered show changes in visitation, but often other ports of entry show changes as well. While some of the relationships between entry numbers and a rise or fall in visitation seem intuitive, all relationships where port of entry was altered do not show a similar response. This type of non-intuitive finding can be used as a step towards establishing the effects of change at one location on an entire system. When considering the importance of maintaining or developing further ferry transportation linkages into Nova Scotia, this type of analysis presents this issue as one that should be discussed at a provincial scale, rather than just remain the problem of one particular community.

As an emerging technology, the use of ABM as a PSS in tourism planning is an application that holds both great potential, but is also accompanied by several significant hurdles. These adoption bottlenecks include a lack of awareness of and a lack of experience using ABM, user interface and technical constraints, and the overall fit of ABM with planning tasks. TourSim is affected by all of these bottlenecks, particularly when compared to more conventional GIS-based PSS. Ongoing research into adding ABM functionality within commercial GIS may aid in overcoming this constraint, raising awareness of ABM, and providing ABM tools to the substantially larger base of GIS users.

Conclusions

Tourism development is a process that is marked by complexity, multiple stakeholders, and a great deal of outcome uncertainty. In a location such as Nova Scotia, where tourism represents a vital part of the economy, the desire to develop new attractions and try new approaches to increase tourism benefits must be tempered by the risk inherent in these plans. Dynamic scenarios can serve as a starting point for community consultation on developing and evaluating a range of tourism policies. This is one of the strengths of an ABM-based PSS, such as TourSim, in that it can be used to experiment with and visualize possible outcomes, allowing planners to move beyond trial and error. Using TourSim to generate the port of entry scenarios described in this chapter shows a preliminary outline of the use of ABM as a PSS, and how this would integrate with tourism planning tasks.

Reference List

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