Visioning local futures: agent-based modeling as a tourism planning support system
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Proposed Research Significance:

Global economic restructuring has caused dramatic shifts in the location and viability of economic activities in Canada. Traditional economic foundations such as natural resource extraction and manufacturing no longer adequately support many host regions, creating a state of economic distress (Gill & Reed, 1997; Reid, 2003). Unable to adapt to changing economic conditions, several areas have experienced a rise in unemployment, emigration, and subsequent social problems. Nova Scotia is a province that typifies many of these economic struggles, particularly in rural areas that were once home to thriving fishing and mining industries. To compensate, decision makers have sought new forms of economic development, including investment in non-traditional industries. While not an economic saviour in and of itself, tourism can provide a partial solution as one component of a broad economic diversification strategy (Gill & Reed, 1997).

Tourism planning is a complex undertaking that balances the potential benefits and negative impacts generated by tourism. Within tourism planning, policy interventions (whether at the destination, regional, provincial, or national scale) tend to focus on time and site-specific evaluations of impacts and benefits, ignoring the interaction and feedback among tourism processes, industry structure and tourist visitation trends. Because tourism processes operate at simultaneous geographic, operational, and decision-making scales, it is extremely difficult to identify the cascading effects of policy changes throughout the industry (Bahaire & Elliot-White, 1999; Hasse & Milne, 2005). Contemporary research efforts suggest that tourism planning can and should adopt a view of tourism as a complex, dynamic system and strive to incorporate this perspective into planning approaches (Burns, 2004; Jamal, Borges, & Figueiredo, 2004).

One framework that addresses these characteristics is computational social science. Computational social science and the field of complex systems integrate themes of non-linearity, interaction, heterogeneity and aggregation, using computational approaches (e.g., computer simulation) to complement traditional approaches such as statistics, mathematical models, and survey analyses. This framework is often applied to the study of dynamic system interactions, and presents an alternative to the reductionist destination case study approach that is prevalent in tourism studies. Agent-based modeling (ABM) is one way to implement and test a computational social science framework within an applied context. ABM is a computer-based simulation platform that captures and models the heterogeneity, interaction, and decision-making strategies governing the behaviors of individuals, or “agents”, as they move and interact in a virtual landscape. ABM can provide a platform to iteratively develop, formalize, and test hypotheses and scenarios of tourism policy and local economic management initiatives (Grimm & Railsback, 2005).
Possible tourism planning scenarios to be represented in an ABM include: developing a regional chain of related tourism businesses, reducing overcrowding at major attractions, and planning for the construction or loss of transportation linkages. For risky policies, this approach provides an opportunity for planners and stakeholders to preview future outcomes and modify management approaches accordingly, avoiding trial-and-error planning (Holling, 1978). While an ABM could provide quantitative planning benefits, the qualitative and often political nature of the environment in which tourism operates may not be well represented in a computer model. Establishing these limitations, as well as constraints such as user interface and system adoption, form a key focus of this research.

Research Goals and Methodology:

The overall goals of this research project are twofold. First, to apply a computational social science framework to the study of complex, dynamic and scaled processes of tourism planning for economic development; and second, to evaluate the potential for ABM as a planning support tool for tourism policy development.

The proposed research uses a computational social science framework to evaluate the potential effects of several economic development scenarios, expressed as policy initiatives, on the development of tourism in Nova Scotia, Canada. To answer the above research goals, I will first collect data from planning professionals via a user-needs assessment survey. This data will be used to identify several tourism planning scenarios of local importance, as well as establish planner decision support system needs. Second, I will develop a conceptual model that lays out the basic structure of the scenarios; namely the interacting processes, variables, and characteristics of the multi-scaled tourism system. Third, I will formalize the aforementioned results in an ABM that will 1) act as a platform to model scenarios of tourism interactions, 2) be used as a tool for communication with tourism planners. This step is essential, as it presents the complex system of cross-scale tourist and industry processes as a collection of identifiable rule-based agents that interact within a landscape of competitive destinations. These ABM scenarios will support iterative manipulation of key policy drivers, allowing users to experiment with and evaluate specific scenarios. This type of analysis will assist Nova Scotian planners to better conceptualize the cross-scale dynamics of tourism, and correspondingly develop a more robust tourism industry. Lastly, planning workshops will be used to introduce these models and the scenario building process to a wide variety of potential ABM users within the tourism planning community. These workshops, as well as follow-up interviews, will be used to evaluate the utility, constraints, and future potential of ABM within tourism planning.
Reference List for Program of Study


Bibliography


