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Thesis summary

E-government is a rapidly emerging research field in recent decades. Benefits of deploying E-government service are obvious in the sense that more flexible services are provided to satisfy citizens' divergent needs and the quality is improved through integrated services. However the adoption rate of E-government is still relatively low, especially for transactional services. Extant works on E-government have examined this phenomenon from various perspectives by using both qualitative and quantitative research methods. However, there is a lack of empirical study that could investigate this phenomenon from a service system perspective by identifying and integrating the involved stakeholders and their relations as a holistic system.

In this thesis, we propose to apply a “bottom-up” approach, agent-based simulation, to investigate the citizen-centered E-government service system from such a perspective. We've built a conceptual model to identify the characteristics of heterogeneous stakeholders, their adaptive behaviors, and the interaction mechanisms among them. By implementing an agent-based model based on the conceptual model, we are enabled to examine citizens' divergent E-government adoption behaviors in different scenarios, to evaluate the cost-effectiveness of supporting strategies and to optimize resource allocation in terms of user support among different social groups.

The thesis is organized as follows,

Chapter 1 introduces the research background and motivation of this thesis, based on which the research questions are proposed. A new perspective, service system perspective, and methodology, agent-based approach, are proposed to investigate the citizen-centered E-government service system from a holistic view.

Chapter 2 reviews the literature of E-government research from the aspects of E-government's definition and evolution, applied methodology and theoretical framework, and agent-based approach. The position of this thesis in literature is discussed and argued.

Chapter 3 proposes the conceptual framework identifying involved stakeholders, their adaptive behaviors against the environment and mutual interactions. The characteristics of heterogeneous citizens and their decision-making process, the properties of services, and the government-side activities are proposed and defined. Different stakeholders are identified and integrated in this framework based on which the agent-based model are constructed and implemented.

Chapter 4 focuses on the citizen side, for which we apply agent-based modeling to investigate how citizens from different social groups choose channels to utilize certain kind of governmental services over time. In addition, we investigate the influence of the adaptive learning within communities that are composed of citizens with different preferences on E-government adoption, and explored the effectiveness of supporting policies, such as learning programs and information promotion, in a long-term perspective. With respect to the E-government service adoption, we assume that learning within communities which focuses on the competence and practice of individuals connected by strong ties is more common than that via social network, which emphasizes relations among members with weak ties. On the other side, the spread of information/knowledge on E-government might also influence the learning process, and further affect the adoption behavior indirectly. Understanding such dynamic learning mechanism is crucial to the investigation of divergent citizens' adoption behavior of E-government services, thus potentially important to the evaluation and design of supporting policies as well. This model enables the understanding of a wide range of possible adoption behaviors under different scenarios, and the exploration of to what extent the variant supporting policies are effective. The agent-based model is constructed based on the analytical model of social learning dynamics and validated against the corresponding propositions.

Chapter 5 works on the public sector side. In order to encourage more citizens to utilize E-government services, there are many kinds of user support provided, though the effectiveness might vary among different social groups. Due to limited resources, if more resources are allocated to social groups who are not favored by E-government service, it is very possible that in turn other social groups will not be satisfied and thus further influences the adoption rate. Therefore how to allocate the limited resources in an optimized way such that all the social groups are satisfied is a challenging and meaningful research problem. We resolve those conflicted objectives and achieve a set of Pareto efficient solutions of the resource allocation among different social groups by using agent-based approach with multi-objective genetic algorithm.

Chapter 6 analyzes the simulated data from both macro-level and micro-level perspectives. Not only the macro-level E-government adoption phenomenon could be analyzed, but also the community-level dynamics are scrutinized. Insight and knowledge gained from the result analysis could help policy makers understand citizens' divergent needs more comprehensively, design better E-government systems and implement community-specific strategies to entice more citizens.

The final chapter concludes this thesis and reemphasizes the contribution. Future research directions are proposed and discussed. Firstly, fieldwork

could be conducted to collect empirical data for model parameter calibration and model validation. In addition, the framework of this thesis could be generalized and interpreted to fit into other service domains. Furthermore, community structure, organizational hierarchy, spatial modeling could be considered and integrated into the general framework as well.