

# Modeling and Analysis of Complex Technology Adoption Decisions: An Investigation in the Domain of Mobile ICT <sup>1</sup>

Rahul C. Basole

Tennenbaum Institute  
School of Industrial & Systems Engineering  
Georgia Institute of Technology

[rbasole@isye.gatech.edu](mailto:rbasole@isye.gatech.edu)

## Dissertation Abstract

**Scope.** Over the past few years, mobile information and communication technologies (ICT) have generated a significant amount of hype and interest. Recent advances in mobile ICT have led to the emergence of new types of enterprise applications and information systems. These emerging solutions leverage the unique characteristics of mobile ICT to provide end-users anywhere and anytime access to context-critical enterprise applications and data. Experts have argued that mobile enterprise solutions have an enormous potential to transform enterprises, business processes, and services, improve employee productivity, effectiveness, and efficiency, and confer competitive advantage and business agility. Despite its value and many potential benefits, however, widespread enterprise adoption of mobile solutions has not been as extensive as anticipated. While mobile ICT promise to fundamentally change the “way” business and commerce will be done, the “way” is still emerging, and the path and contextual conditions to get there have not been addressed. Hence, the following three questions are of critical importance:

1. What is the (transformational) value and impact of mobile ICT in enterprises?
2. What are key determinants of enterprise adoption of mobile ICT?
3. What makes an enterprise “ready” to adopt mobile ICT?

The objectives of this dissertation are to fill the theoretical gap and address these three questions by conducting a comprehensive investigation of the value propositions and associated costs and benefits of mobile ICT, developing a theory of mobile enterprise transformation, and introducing and developing the concept of enterprise readiness for mobile ICT.

**Methodology.** To capture the complexity of mobile ICT adoption decisions, this dissertation uses a theory-building approach by combining quantitative and qualitative research methodologies. Drawing on theories from the information systems, technology management, and organizational innovation literature, the dissertation first provides an integrative conceptual framework of salient organizational, technological, managerial, and environmental factors that influence enterprise adoption of mobile ICT and then develops a multi-dimensional enterprise readiness framework. Next, the dissertation uses a modified two-stage Expert Study approach to validate the dimensions and assessment indicators of the enterprise readiness framework and determines their relative importance using an experimental design approach. Lastly, these findings are integrated into a web-based decision support tool.

**Contributions.** This study is a valuable and useful resource for both researchers and practitioners concerned with the adoption of emerging ICT, in general, and mobile ICT, in particular, and contributes in multiple important ways. First, from a theoretical perspective, this research identifies the salient determinants of mobile ICT adoptions and their relative importance, develops a theory of mobile enterprise transformation, and introduces and develops the concept of mobile readiness. Second, from a practical perspective, this research develops a web-based mobile readiness assessment diagnostic tool, which aids decision makers to navigate through the complex mobile ICT adoption decision space, assess their current state of readiness to adopt and implement mobile ICT, and facilitate the development of appropriate enterprise mobility strategies.

---

<sup>1</sup> The author would like to thank his dissertation chair Dr. William B. Rouse and his dissertation committee members, Dr. Stephen E. Cross and Dr. Richard A. DeMillo, for their valuable help and guidance.