Towards a Theory of Mobile Enterprise Transformation: A Multi-Phase Framework

> Research Update

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Towards a Theory of Mobile Enterprise Transformation: A Multi-Phase Framework

1. Dissertation Overview: Introduction & Motivation
2. Mobilizing the Enterprise
3. Literature Review: Related Work and Theoretical Background
4. A Theory of Mobile Enterprise Transformation
5. Next Steps and Related Research
6. Q&A
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Dissertation Overview

Snapshot

**Title:**
- **Modeling and Analysis of Complex Technology Adoption Decisions:**
  An Investigation in the Domain of Mobile ICT

**Committee Members:**
- **Dr. William B. Rouse**, Chair
  Executive Director (TI), Professor (Computing, ISYE)
- **Dr. Richard A. DeMillo**
  Dean (Computing)
- **Dr. Stephen E. Cross**
  Director (GTRI), Professor (ISYE)
Dissertation Overview: Introduction and Motivation

Practical Perspective

- Enterprises are constantly looking for ways to improve employee productivity, have higher effectiveness and efficiency, attain competitive advantages, improve customer service and responsiveness, reduce cycle time, speed decision-making, and increase business agility (IFIP Workshop, 2005; IEEE CEC Workshop, 2005).

- Mobile applications (and Mobile ICT, in general) offer many potential benefits and value propositions that can address these objectives; as a result, more and more enterprises are considering adoption (Basole, 2004).

- **Mobility has moved from point solutions to being on the strategic agenda of leading enterprises** (CapGemini, 2004).

- However, a lot of uncertainties exist and implications are not fully understood. Widespread adoption is therefore not as extensive as initially anticipated (Gartner, 2004).
Dissertation Overview: Introduction and Motivation

Theoretical Perspective

- Previous research on innovation/technology adoption has primarily focused on consumers/end-users.

- While there is a growing base of organizational adoption of innovations studies, models tend to
  1. Draw their theory base from one particular domain (Information Systems, Strategy, Marketing, Organizational Behavior, Economics, etc.) and
  2. Generally focus on a single perspective (Organizational, Technological (Innovation), Environmental, or Managerial/Leadership)

  → Need for a more holistic approach through theory integration

- Mobile ICT is an innovation with transformational capabilities that has only recently emerged; as such it has received little attention in the academic literature to-date.

  → Examine whether existing theories apply to mobile ICT adoptions
Dissertation Overview: Introduction and Motivation

Research Questions

1. Why should enterprises care about mobile ICT?
   - What are the value propositions?
   - What are the costs and benefits?
   - How can/do mobile ICT transform enterprises?

2. What factors influence the enterprise adoption of mobile ICT?
   - What are the key determinants?
   - What is their relative importance?

3. What constitutes mobile readiness?
   - What are the key dimensions?
   - What indicators can be used to measure it?
Dissertation Overview: Introduction and Motivation

Expected Contributions

- **Theory**
  - Identify salient *determinants* of mobile ICT adoptions & their relative importance.
  - Develop a *theory of mobile enterprise transformation*.
  - Introduce and develop the concept of *mobile readiness*.

- **Practice**
  - Develop a Web-Based *Mobile Decision Advisor*, which aids decision makers to
    1. *Assess* the Current State of Enterprise Mobility,
    2. *Determine* the Degree of Mobile Readiness, and
    3. *Facilitate* the Development of appropriate Mobility Strategies.

- **Education**
  - Provide a *Learning Tool* for CIOs, Managers and Decision Makers.
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Mobilizing the Enterprise
Catalysts for Enterprise Mobility

- Information Availability
  → Real-time information at point of action
- Information Visibility
- Responsiveness
- Decision Making Speed
- Cost Savings and Efficiency
- Productivity

- Proliferation of Devices (Blackberry, Smart Phones, Treo, Laptops, PDAs)
- Improved Feature/Functionality of Devices and Solutions
- Reduced Prices for Bandwidth Access
- Improved Network Speed
Mobilizing the Enterprise

Mobile Enterprise Data Users

Source: IDC Research, October 2004
Mobilizing the Enterprise

Common Mobile Enterprise Applications

- Video/Imaging
- ERP Inspections
- ERP Manufacturing
- SCM/Logistics
- ERP II/EAM
- CRM Field Service
- CRM — SFA
- RFID
- Mobile E-Mail/PIM
- Mobile IM/SMS

Source: Gartner, November 2003
Mobilizing the Enterprise
An Overview of Mobile Enterprise Applications Areas
Mobilizing the Enterprise

Mobile Enterprise Solutions – Examples
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Literature Review: Related Work and Theoretical Background

Research Streams and Theories

- Information Systems
- Innovation
- Telecommunications
- Marketing
- Economics and Public Policy
- Management, Strategy, and Organizational Behavior
- Decision Sciences, Technology Mgmt., and Operations Mgmt.
Literature Review: Related Work and Theoretical Background

Methodology

- MISQ Barki Keywords:
- Sources
- Selection Criteria
  - Studies focused at the firm, organization, or enterprise level of analysis
  - Studies published in the 7 functional categories and associated leading journals/conferences
  - Doctoral dissertations and working papers were excluded
- Results
  - 350+ articles / 74 journals / 6 conferences / 8 Books
  - Articles are classified according to (1) Year of Publication, (2) Functional Discipline, (3) Publication, (4) Research Methodology, (5) ICT Type, and (6) Theoretical Frameworks
Literature Review: Related Work and Theoretical Background

Findings

- **Growing Base of Enterprise Adoption Research**
  - Predominantly Case Studies and Empirical Research

- **Lack of an Integrative Model**
  - “Functional Domain Silo Syndrome” with a Few Exceptions

- **Lack of Phase-Based Theory/Studies**
  - Most studies examine impact at a single point in time
  - While a few longitudinal studies exist, its theoretical base appears to be rather unexplored

- **Only a few studies on Mobile ICT exist**
  - Most studies examine existing innovations (technology, systems, and processes)
  - Only few studies venture to explore “emerging” technologies
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A Theory of Mobile Enterprise Transformation

Introduction

- Based on the literature review, examination of business press articles, case studies, industry reports, and expert opinion, and drawing from the following theories:
  - Diffusion of Innovation Theory (Rogers, 1995)
  - Theory of Technology Implementation (e.g. Cooper and Zmud, 1990)
  - Organizations and Innovation (e.g. Zaltman et. al, 1973)
  - Theory of Enterprise Transformation (Rouse, 2005)
  - Business Value of IT
  - Theory of Business Agility

A Conceptual Model of Mobile Enterprise Transformation is proposed.
A Theory of Mobile Enterprise Transformation

Multi-Phase Model

- **PHASE 0**: No Mobilization
- **PHASE 1**: Mobilization
- **PHASE 2**: Enhancement
- **PHASE 3**: Reshapement
- **PHASE 4**: Redefinition

**Impact**

**Transition Catalysts & Factors**

**Transformation Level**

**Transition Decisions**

**Initial Adoption Decision**

- **Convenience**
- **Efficiency**
- **Competitive Advantage**
- **New Core Competence**

**Existing Data and Processes**

**New Data and Processes**

**Strategy and Business Models**

**Industries and Markets**
A Theory of Mobile Enterprise Transformation

Phase 1: Mobilization

- Mobilization refers to the process of making existing enterprise data and applications available for use on mobile and wireless devices, anywhere and anytime.

- Early solutions were primarily mobile extensions of their fixed-wired counterparts, often ‘mobilized’ through “transcoding” or “morphing” mechanisms without having the mobile end-user and context in mind.

- More recent mobile applications take the user and context into consideration, delivering a higher level of task-technology fit.

- Examples include access to corporate e-mail, the Intranet, and other internal sources.

- Higher level of user convenience through access to information and communication flexibility → leads to immediate gains in productivity (eliminate down or waiting time), efficiency, and decision speed.
The second phase shifts its focus from mobilizing existing data and applications to enhancing existing and creating new business processes that leverage the unique functionalities and capabilities of mobile technologies.

Typically, such processes include two key elements: (1) mobility (do it anywhere) and (2) immediacy (do it now).

Examples of common mobilized processes include:
- Sales force automation
- Field force automation
- Customer service oriented applications
- Inspection
- Bedside healthcare data collection
- Parcel delivery

The enhancement phase may impact working practices and modify processes but seldom changes the business in a fundamental manner.
A Theory of Mobile Enterprise Transformation

Phase 3: Reshapement

- As enterprises transition to phase 3, mobile solutions begin to reshape business models and strategies. The creation of innovative new mobile processes and services provide enterprises with a source of competitive advantage.

- In this phase, mobile solutions often enable a business capability and become a critical element in the overall business model.

- For example, wireless sensors could enable a pharmaceutical company to move from selling medication to a model in which the company provides both medication and sensors, and enters into a contract with a medical practitioner to perform continuous monitoring and keep a patient’s blood pressure within an agreed range.
A Theory of Mobile Enterprise Transformation

Phase 4: Redefinition

- In the fourth phase of the transformation process, mobile solutions create new core enterprise competencies.

- Entire business models and strategies are based and revolve around enterprise mobility and in turn lead to a redefinition of entire markets and industries.

- To the best of my knowledge, concrete examples for this phase of the mobile transformation have not emerged yet.

- However, as enterprises continue to embrace mobility and mobile ICT mature, mobile redefinition is expected to become an emerging enterprise phenomenon.
A Theory of Mobile Enterprise Transformation
Adoption & Transition: Catalysts and Factors

### INTERNAL CATALYSTS
- Technology Opportunity
- Strategic Reasons
- Economic Reasons
- Enterprise Need
- Bottom-Up Diffusion
- Bandwagon Strategy
- Managerial “Fads and Fashion”

### EXTERNAL CATALYSTS
- Technology Push
  - e.g. Aggressive Vendor Marketing
- Environmental/External Pressure
  - Stakeholders
  - Network Externalities
  - Regulatory

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### Adoption & Transition
- Formal Plan and Task Force
- Years of Mobile ICT Experience
- Awareness
- User Attitudes towards Change
- User Skills
- Senior Leadership
- Presence of a Champion
- Knowledge / Previous Experience
- Strategic IT Vision
- Top Management Support
- Mgmt. Perspectives and Attitudes
- Managerial attitude toward Change

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### Mobile Readiness
- Support Marketing Efforts
- Consumer Readiness
- Competitive Pressure
- Partner Readiness
- Governmental Regulations
- Network Externalities
A Theory of Mobile Enterprise Transformation

Concept of Mobile Readiness

**Definition:** Mobile Readiness is an organization’s (or decision maker’s) assessment of mobile enterprise readiness (MER) and external context readiness (ECR).
A Theory of Mobile Enterprise Transformation

Dimensions / Sub-Dimensions of Mobile Readiness

- Mobile Enterprise Readiness (MER)
- External Context Readiness (ECR)

**Mobile Readiness**

**Technology Readiness**
- Knowledge Readiness
- Process Readiness
- Resource Readiness
- Leadership Readiness
- Values and Goals Readiness
- End User Readiness

**Organizational Attributes**

**Managerial Attributes**

**Technological Attributes**

**Environmental Attributes**

- Regulatory Readiness
- Stakeholder Readiness
- Technology Readiness
- Supporting Industry Readiness
A Theory of Mobile Enterprise Transformation

Adoption / Transition Evaluation

Transition Factors

Internal Catalysts

External Catalysts

Mobile Readiness

Transition Factors

PHASE 0
No Mobilization

PHASE 1
Mobilization

PHASE 2
Enhancement

PHASE 3
Reshapement

PHASE 4
Redefinition

New Core Competence

Competitive Advantage

Efficiency

Convenience

Existing Data and Processes

New Data and Processes

Strategy and Business Models

Industries and Markets

Convenience

New Core Competence

Competitive Advantage

Efficiency
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Next Steps and Related Research

Delphi Study

- Validate the mobile readiness sub-dimensions & their definitions in a 2-round Delphi Study.
  - Note: Since these dimensions are theoretically identified and defined in the literature, a semi-structured approach to data collection can be used.

- Expert panelists (~ 15-20) are selected from industry and academia.

- Panelists will be requested to respond to the following questions for each of the dimensions (on a Likert-type scale with a response range of 1 (not important) to 4 (critically important)).
  1. “How important do you think it is to assess this dimension when planning for mobile ICT?”
  2. “Do you think this dimension should be retained, modified, or deleted?”
  3. “If applicable, how would you modify this dimension?”

- Panelists will also be asked to identify and define any additional dimensions that they think are needed to adequately assess enterprise readiness for mobile ICT.

- Lastly, panelists will be requested to identify and validate preliminary indicators by which to measure each of the mobile readiness dimensions.
Next Steps and Related Research

Mobile Decision Advisor (MDA)

- The MDA is an interactive Web-Based Support System that guides managers through the complex Mobile ICT Adoption and Transition Decision Space and provides (general and/or specific) Strategic Recommendations.

- The MDA consists of 3 components:
  1. Enterprise Mobility Audit
  2. Mobile Enterprise Readiness Assessment
  3. Mobile Enterprise Strategy Assessment
Next Steps and Related Research

An Example of a Mobile Enterprise Readiness Profile
Thank you.

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